Business and Health Administration Association
Division of MBAA International
2016 Meeting
Chicago, Illinois

ABSTRACT AND PAPER PROCEEDINGS

BHAA President – William "Kent" Willis
Program Chair – Vivek S. Natarajan
Proceedings Editor- Jean Sanchez

PROCEEDINGS

of the
BUSINESS AND HEALTH ADMINISTRATION ASSOCIATION

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2016 PROCEEDINGS EDITOR
Jean Sanchez
Washburn University
Topeka, KS

Sample Footnote: Please use the following style when referring articles from the Proceedings: Zakari, Nazik M.A. (2009), "The Influence of Academic Organizational Climate on Nursing Faculties Commitment in Saudi Arabia," in *Business & Health Administration Proceedings*, Avinandan Mukherjee, Editor, p. 244.

Letter from the BHAA 2016 President

William "Kent" Willis
Marshall University

Dear BHAA Colleagues:

I would like to welcome everyone to the 2016 Business and Health Administration Association (BHAA) Conference. I first began attending the BHAA conference in 2003 and have watched it grow into annual event that I look forward to attending each year. The conference offers each participant an opportunity to network and share with others in many ways. Bringing together scholars, teachers, students, clinicians, and others associated with health care the BHAA conference has something for everyone in attendance.

In recent years the conference is seeing a steady increase in participants on a global basis. The addition of this international attendance and participation illustrates the growth and magnitude of the conference. This international participation brings new ideas and concepts from various health care systems which in turn creates discussion and networking opportunities.

The BHAA exists under the umbrella of the MBAA International organization. The 2016 conference promises to be one of high quality caliber supported by the various specialty tracks that are chaired by high quality and known individuals within their disciplines. As I have mentioned my attendance at the conference began in 2003 and I now consider many of the individuals who attend as family, because that is how you will feel when you attend. I look forward to talking with you at the conference and hope that you find your attendance was well worth your time.

I cannot close this welcome without expressing my gratitude to Vivek Natarajan, Jean Sanchez, and Zack Hill for their efforts in making this conference a success. Finally, I want to thank all of those who submitted their papers or abstracts for inclusion into the program.

Dr. William "Kent" Willis

President – BHAA 2015/16

Letter from the BHAA 2016 Program Chair

Vivek S. Natarajan
Lamar University

Dear BHAA Colleagues:

It has been my privilege to serve as the Program Chair for this year's annual BHAA conference. I remember attending my first BHAA conference over 5 years ago and I was impressed by the collegiality and quality within the conference. I am glad to say today those same characteristics are still present in the conference and are growing, as each year the conference allows us to make new friends and colleagues.

This year we have seen an increase in total abstract and paper submissions and have a total of 98 submissions. Submissions from physicians, scholars, teachers, and students include a wide variety of healthcare discipline topics. As in the past we have submissions from our international colleagues and we always look forward to seeing them at the conference. I trust that you will find the presentation sessions to be informative, allowing for discussion. This year we have included a special session on the "Research Methods in Healthcare-" of which many conference participants will find informative.

I am glad that you have chosen to participate in this year's BHAA conference and I look forward to seeing you at future conferences. I especially thank my colleagues who have helped in preparing the proceedings and program. My job was made very easy by the mentorship provided by President Kent Willis and support by Proceedings Editor Jean Sanchez and Zack Hill. I also need to acknowledge the help of MBAA Executive Director Jeff Clark. Most importantly, I want to say thank you for all those who participate and support the BHAA 2016 conference.

Sincerely,
Vivek Shankar Natarajan
Program Chair-BHAA 2015/16

Letter from the BHAA 2016 Proceedings Editor

Jean E. Sanchez
Washburn University

Dear BHAA Colleagues,

It has been a pleasure serving as Proceedings Editor for this year's conference. As you have already read in the previous letters, this year's increase in participants has been exciting and it will be very interesting to attend the sessions at the conference in April. The work that all of you put into your submissions and the conference presentations is appreciated by everyone.

This will be my third year attending and presenting at the BHAA with my colleagues and our students. I can honestly say that it has become my favorite annual conference because of the collegiality and excellent educational opportunities. The increase in global participation is also exciting and I look forward to learning from colleagues from many countries.

Thank you to everyone for your participation in the BHAA 2016 conference and I hope to have the opportunity to meet many of you in April. I would also like to express my appreciation for the leadership provided by President Kent Willis and Program Chair Vivek Natarajan, along with the extensive assistance given by Zack Hill.

Congratulations to all of you and again, thank you for your hard work in preparation for the conference.

Sincerely,
Jean E. Sanchez
Proceedings Editor-BHAA 2015/2016

Best Paper Awards

BHAA OVERALL BEST PAPER AWARD

TRACK: PEDAGOGY

A Long Term Care Administration Practicum Cohort Model with Adjunctive Applied, Online Coursework

Jennifer Johs-Artisensi and Douglas Olson

TRACK: PEDAGOGY

A Long Term Care Administration Practicum Cohort Model with Adjunctive Applied, Online Coursework

Jennifer Johs-Artisensi and Douglas Olson

TRACK: PHYSICAL THERAPY

The Effect Of A Sport-Specific Plyometric Training Program On Knee Joint Strength In The Return To Sport Female High School Athlete Post ACL Reconstruction With A Concomitant Meniscal Repair: A Case Report

Kischa S. Reed, Jamal Alian, Blake Banner, Patrice Brown, Taras Deputat, Michael Johnson, and Kevina Parker

TRACK: HEALTH ECONOMICS

Quality of Care and Profitability in Not-For-Profit versus For-Profit Nursing Homes

Drs. David P. Paul, III, Tyler Godby, Sarah Saldanha, Jazmine Valle, and Alberto Coustasse

TRACK: INTERNATIONAL

Are Refugees for us a Threat or an Opportunity?

Libusa Radkova, Lucia Ludvigh Cintulova, and Katarina Bundzelova

TRACK: HEALTHCARE MANAGEMENT

Public Health and Primary Care: Expanding the Role

Peter Fitzpatrick, Marcia Butler, Kendolyn Smith, and John Bryan

TRACK: NURSING

A Study Assessing Home Health Nurses' from a Carative Perspective

Rodeen Lechleitner

TRACK: HEALTH INFORMATICS

Big Data Management in United States Hospitals: Benefits and Barriers

Chad Schaeffer, Ariful Haque, Lawrence Booton, Jamey Halleck, and Alberto Coustasse

TRACK: HEALTH AND WELLNESS

Testosterone Replacement Treatment: Fountain of Youth or La Brea Tar Pit?

David Paul

BUSINESS AND HEALTH ADMINISTRATION ASSOCIATION

ABSTRACT AND PAPER PROCEEDINGS

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WOMEN'S HEALTH

TRACK
EDUCATION

A LONG TERM CARE ADMINISTRATION PRACTICUM COHORT MODEL WITH ADJUNCTIVE APPLIED, ONLINE COURSEWORK

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A LONG TERM CARE ADMINISTRATION PRACTICUM COHORT MODEL WITH ADJUNCTIVE APPLIED, ONLINE COURSEWORK

Jennifer Johs-Artisensi, University of Wisconsin – Eau Claire
Douglas Olson, University of Wisconsin – Eau Claire

ABSTRACT

In 2009, the Health Care Administration Program at the University of Wisconsin – Eau Claire launched a single cohort model for its Practicum experience, and supplemented the structured internship-like experience with a series of adjunctive, applied, online coursework to maximize learning and leadership development of its future graduates. This case study approach describes the background and rationale for such a model, the model itself, and implications for this type of approach to a structured practicum experience in long term health care administration. This innovative program provides a year-long, structured experience for each student, where they can learn the role of the health care administrator in depth at a single site, but through the use of three in-person learning modules with their cohort and two series of applied, online courses where they interact with their cohort, they also have significant opportunity for peer-to-peer learning and gain a broader breadth of experience through these unique learning activities. Student performance under this new model has thus far been positive, as evidenced by faculty reports of critical thinking and better quality of work in classes, increased interaction and networking among the cohort, positive evaluations from preceptors, and employability of graduates.

BACKGROUND

The field of long-term care administration is facing a growing crisis: more people are leaving the field than are entering (Meyers, 2012), and this critical issue is occurring against a backdrop of rising demand and dwindling fiscal resources. New administrators need quality practicum/AIT experiences to ensure that they are well prepared for their future careers, and educational programs are in a unique position to supplement the on-site experience with a variety of adjunctive structures to best facilitate student learning.

Research indicates the practicum/AIT experience has a strong influence on future success. The American College of Health Care Administrators (ACHCA) and the National Association of Long Term Care Administrator Boards (NAB) Foundation commissioned a Whitepaper by Dana and Olson (2007) which discussed the importance and uniqueness of the educational component of the field experience in long-term care, and both Siegel (2009) and Olson, Johs-Artisensi, Vaughan's (2013) research has suggested that the practicum/AIT and several factors that influence that experience are critical to the effective development of healthcare administration competencies. It is clear that the practicum/AIT is an essential educational component that serves as a transition between student and employment status and is critical to both the short- and long-term success of potential administrators.

For a long term care administration program to be accredited by NAB, a 1000 hour practicum/AIT experience is a required component (NAB, 2015). Many factors can influence this experience in terms of the type and quality of the site and the services it offers, the quality characteristics of the administrator, how skilled the administrator is as both an administrator and as a preceptor, and how engaged the rest of the organization's leadership team is (Johs-Artisensi, Olson, 2012). In addition, the level of engagement of the practicum student/AIT also likely plays a role, but another key ingredient is how the Academic program structures the experience and supports the students and preceptors in the experience as well.

The value of the Practicum/AIT experience is that the student is in one place long enough to gain exposure to key aspects of how a facility functions, as well as develop an understanding of the role of the administrator and begin to develop their own personal leadership style. However, one of the downsides of many internship-like experiences is that the trainee is learning primarily from the model of a single administrator-their own preceptor and

is only learning one organizations' approach to care delivery, quality improvement, operations management, and leadership.

Many Long Term Care Administration programs are small and have few students and the practicum experience occurs fairly independently, however, even with a small group of students, the authors believe that an educational cohort model offers several opportunities. A cohort is a group of students who begin and end an educational journey at the same time, and engage in a common learning experience. A cohort model lends itself to development of a supportive learning community (Barnett and Muse, 1993; Dinsmore and Wenger, 2006) which helps socialize students to the professional practices of teamwork and collaboration (Dinsmore and Wenger, 2006; Mandzuk et al., 2003), and has a positive impact on students' professional growth (Browne-Ferrigno, 2003). The cohort design offers several impacts beyond the expected increase in networking and cohesiveness, such as changes in interpersonal relationships, the shifts in relationship with faculty, the potential for bonding and connection, and the deeper discussion of issues (Teitel, 1997). Basom, Yerkes, Norris, and Barnett (1995) posit that the cohort model has tremendous potential for developing collaborative, transformational leaders, which is a key skill that health care administrators must develop.

A thoughtfully structured practicum/AIT experience offers opportunities for both experiential and theoretical learning (Franks & Oliver, 2012), which are both very important for professional development. The opportunity to integrate course knowledge with practical experience in specific context encourages an authentic learning experience, and using reflective pedagogies, such as journaling, is a useful tool in students' professional development (Dyment & O'Connell, 2010) by helping them to make connections between theory and practice, ask questions, and engage with higher order thinking (ChanLina & Hung, 2015).

Beyond individual journaling, Guthrie & McCracken (2010) studied online guided reflection pedagogies in experientially based learning, and found them to universally have a positive impact on student learning, including building relationships with classmates, increased learning through application of theories to practice, and developing critical thinking that enabled meaningful and deep learning that extended beyond the learning experience itself. They also found that these pedagogies even more significantly developed achievement of shared learning outcomes when used with geographically dispersed students.

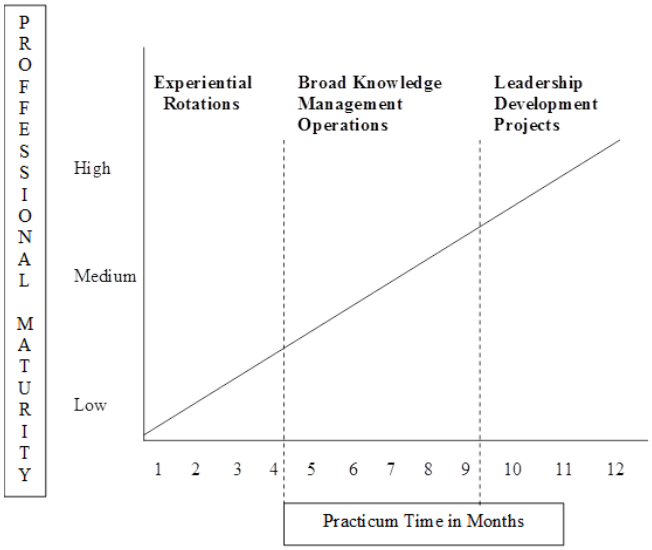
Since University of Wisconsin – Eau Claire Health Care Administration students are spread among several states for their practicum experiences and because we saw the value in peer-to-peer learning that could occur in a web-based, applied learning environment, leveraged on a cohort model, we redeveloped our approach to our previously very individualized and independent year-long practicum experience.

THE UNIVERSITY OF WISCONSIN – EAU CLAIRE PRACTICUM APPROACH

The University of Wisconsin – Eau Claire has the largest, and strongest NAB-Accredited long term care administration program in the country. We use an innovative educational approach for developing leadership skills in their students, preparing them to lead long term care organizations across the care continuum, which could be modeled by other schools, licensing boards, or corporate training programs. In addition to taking multidisciplinary coursework in their first three years of study, in science, social science, business, health care, and aging, students spend the year prior to graduation completing a structured administrative practicum experience in a long term care organization. Beyond experiencing traditional long term and skilled nursing services, all students complete an assisted living rotation, and many also experience independent housing, hospice, home care, and other service lines.

Spending 50 weeks at an organization affords the faculty supervisor, on-site preceptor and management staff the opportunity to invest in the student's development, while the student is there long enough to also engage in projects that "give back" to the organization and residents. Partner organizations know they are getting well prepared students with a high level of structure and faculty support during the practicum year, and pay a significant stipend to practicum students. In addition to the on-site experience, both students and preceptors receive orientation and education about practicum expectations and their respective roles, prior to starting. The 50-60 student cohort is brought together three times during the year for two-3 day "learning modules" where group supervision, content delivery and peer networking occurs, and practicum students also take faculty-led online courses to deliver additional content, facilitate applied learning experiences, increase faculty supervision, and allow students to learn from each other. Our current practicum approach leverages technology to facilitate peer-to-peer learning, encourages

exploring best practices and exposes students to a variety of scenarios and management approaches across the spectrum. This supports maximal leadership development, so students are successfully prepared to lead their own long term care organization upon graduation.



The year-long practicum experience is conceptually structured in three major parts that we call fundamental skills (rotations), broad knowledge and leadership development:

- Fundamental Skills: Students rotate through various departments with goals of familiarizing them with the role of both the frontline staff and department manager, as well as the administrative perspective of how to supervise these departments as they begin to gain understanding of how, operationally, each department functions within the broader organization.
    - As a formative assessment, prior to practicum, students take a NAB practice licensure so areas of relative weakness are considered as students build their rotation schedules
    - In the first 3-6 months of the practicum year, students spend approximately 25-35 hours/week completing these departmental rotations.
    - 1-4 weeks is spent in each department, completing a checklist of required learning experiences and compiling an online resource portfolio.
    - Each department manager and preceptor supervise the student, and evaluate their learning and level of engagement.
    - As the practicum concludes, a second NAB practice licensure exam is used as a summative assessment, to assess their learning across the 5 major domains of practice, as well as to help prepare them for licensure.

- Broad Knowledge Areas: Students are introduced to administrative and leadership skills that require team efforts across departmental lines, and initiated into their practice through supervised participation in areas such as resident service, quality management, human resources, regulation, financial management, information systems, and public relations.
    - In each of these areas, students take a 4 week, online course, where applied assignments requiring specific learning activities, observations, organizational data, etc. are designed to facilitate knowledge acquisition and practice.
    - Besides the provision of structured content to students in a practice environment, this format also allows for thoughtful reflection and group discussions among peers, greatly broadening the learning experience of each student.
    - Courses are structured so students gain an understanding of each area's function and interrelationships, the role of the administrator, and the current status of each area at their

organization, and the student also researches best practices, and makes recommendations for change which they are encouraged to share with their preceptor.
    - It is not uncommon for leadership project ideas to be stimulated as a result of the learning activities engaged in for Broad Knowledge courses.

- Leadership Development: Students engage in self examination and use external feedback to facilitate their professional growth, develop key management competencies, and learn to execute strategic leadership practices.
    - Students take a series of 3 hybrid courses, with both online coursework and face-to-face modules, and execute hands-on leadership projects conducted at the practicum organization.
    - Courses are sequenced to build a students' leadership abilities as they grow in skill and assume greater responsibilities. Content integrates topical readings and insights generated from self-assessments like the NAB practice exam, StrengthsFinder, and the Leadership Practices Inventory, along with feedback from preceptors and other organizational leaders, faculty, and peers, culminating in development and implementation of a personal professional development plan.
    - Students also assume leadership of three significant innovative projects, in internal operations, customer service, and external partnerships, within the organization.

CONCLUSION

The benefits of this new approach have been evident by many stakeholders. Faculty see the networking and sharing of ideas and best practices among students in both small group discussions in various online classes as well as on our practicum cohort's general messaging boards. For example, in a class on care planning students were interested to learn that at some facilities the Administrator attended the meetings, at some the residents did, and at still another, a CNA did – sharing these reflections in small groups prompted them to ask why participants differed from facility to facility, why various people at their own facilities were invited to participate (or not), and think about how they might like to do things at their own facility one day. Another example is when a student is launching a leadership project, they often reach out to ask their peers who have been involved in similar initiatives for resources, suggestions, and ideas. We have watched the quality of their coursework and online discussions increase as they have had these added cohort driven applied courses, and their overall learning during practicum has increased as evidenced from significantly improved pass rates on the NAB Nursing Home Administrator licensing exam and increased preceptor evaluation ratings. Finally, feedback from employers about the quality of our students and our students' ability to be hired into significant leadership positions early in their careers following graduation is the best testament of all about how this cohort approach, supplemented with applied online coursework has facilitated the professional and leadership development of our students.

This approach is well suited to long term care administration students, or likely other health care administration students who are striving to develop similar competencies and skill sets. It has been well received by both students and preceptors, as it allows for experiential learning with individualization and customization of each students' needs to each facilities' needs, along with peer-to-peer learning, while ensuring an element of standardization. This allows faculty to feel confident that each student is having an adequately rigorous experience, structured in such a way that they are each becoming increasingly more independent as they learn to apply theory into practice as they progress through the experience.

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TRACK
ETHICS

QUALITY OF LIFE AND THE RIGHT TO DIE: AN ETHICAL DILEMMA

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William B. Stroube, University of Evansville

ABSTRACT

This paper examines the definition, history, current state and ethical theories related to euthanasia in the United States. The review of literature shows varying views and different theories on end of life concerns and the application of euthanasia. Ethical issues with euthanasia and the need to create more alternative treatments for medical professionals are discussed, highlighting possible trends and recommendations. The arguments are deep rooted in philosophical concepts and embrace the understanding that each theory possess in respect for life. Many researchers have and are still working on end of life concepts and ethical reasoning, it is however also worth examining the possible future trends on this issue.

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MENDING THE DIVIDE: ADDRESSING THE PHYSICIAN-ADMINISTRATOR RELATIONSHIP IN LIGHT OF HEALTHCARE REFORM

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Robert J. Spinelli, The University of Scranton

ABSTRACT

The efforts sparked throughout recent healthcare reform have continually pushed the healthcare industry into a historic time of transformation, change, and adaptation. Beliefs, values, and organizational cultures have begun to evolve and adapt in a way to meet the pending needs of those individuals seeking healthcare services. As the physician-patient relationship continues to improve through the emphasis of patient satisfaction and quality driven results, the physician-administrator relationship suffers in the effort to implement needed changes within organizations. This revolutionary time in healthcare has proven frustrating to both physicians and healthcare executives to work as a cohesive unit in the attempt to overcome the challenges of implementation of healthcare reform within the daily operations of organizations. It is crucial for healthcare executives and physicians to overcome the aspects that cause the detrimental divide between one another. Administrators and physicians a like must see the value of one another's role, develop more effect means of communication, and incorporate shared beliefs and values to reach the common goals organizations are working towards.

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SLOTHS, BIO-PROSPECTING, AND WHAT NATURE CAN DO TO ASSIST SURVIVAL

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Catherine Gritzmacher, Georgia State University

ABSTRACT

Amazing discoveries are made accidentally when observing nature and that is exactly how ancient shaman, and healers found what worked in their practice of the healing arts. Algae and fungi, growing on the fur of sloths, are now studied to understand anti-parasitic and antibacterial properties, as well as their role in the treatment of cancer (Higginbotham, et al. 2014).

With the loss of natural habitat, what else are we losing? Bio-prospecting is ongoing even among protests of "bio-piracy" (Liang, 2011). What has nature given to traditional Chinese medicine or traditional Indian medicine (Ayurveda), because they had time and vast areas to explore?

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A STATE GOVERNMENT PRIVACY IMPACT ASSESSMENT EXPERIENCE IN SUPPORT OF PRIVACY BY DESIGN (PBD)

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A STATE GOVERNMENT PRIVACY IMPACT ASSESSMENT EXPERIENCE IN SUPPORT OF PRIVACY BY DESIGN (PBD)

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ABSTRACT

The scope of privacy protection has increased due to the advances in technology, the internet of things, heightened security, ever-present data threats, and the value of information. This environment has raised the expectations for state government's management of personal information and enhanced privacy protections. While the expanse of privacy policy implementation is broad, this paper focuses specifically on how a state government implemented a Privacy Impact Assessment program in support of the Privacy by Design (PbD) model. It explores challenges of creating an effective Privacy Impact Assessment program, designing a tool and the opportunities for managing privacy risks.

INTRODUCTION

The challenges public and private organization face in managing privacy risks is ever increasing and inherently diverse. Generally, when a new project is implemented, organizations will focus on the business and security requirements. Recently, privacy impact assessments (PIAs) have become a vital part of new project processes for addressing privacy risks. Federal and state laws have been designed to protect personal privacy captured in the records held by state government agencies. However, the scope of privacy protection has expanded in light of advances in technology, the internet of things, heightened security, ever-present data threats, and the value of information. This environment has raised the expectations for state government management of sensitive personal information and enhanced privacy protections.

Information technology (IT) offers state governments amazing opportunities to better serve their citizens as they strived to meet their overall service mission. As a complex and dynamic organization, state government departments will use new and innovative IT applications to create databases and reports that enable members of the workforce to do their jobs efficiently and effectively. It is generally understood information technology also creates risk. One prominent area of risk is the difficulty of understanding and addressing internal and external threats to confidential, personal or proprietary data that, if compromised, could cause significant harm to individuals or to departments in state government. It can be stated that more data equals more risks. Another way to state this is where data flows…risk goes.

METHODOLOGY

The purpose of the paper is not to understand some abstract construct, generic phenomenon or to build theory. Using Stake's (1995, 2003) idea of an intrinsic case study, this paper explores how the PIA process, in support of the *Privacy by Design* (*PbD*) model, works in its real life context. Several department privacy officers were also interview. Understanding how emerging risk management protocols in a legal and political environment for privacy is important because of new expectations by the public and the expanding role of state government to manage and protect citizen's personal information collected, used and shared.

While the expanse of privacy policy implementation is broad, this paper focuses specifically on how a state government Privacy Impact Assessment (PIA) program was implemented. Reviewing the state government PIA implementation does not represent other case studies, or illustrates a particular trait or program. However, serves as

an entry point into the strategic considerations, levels of enterprise expertise, and challenges associated with broader privacy policy implementation efforts. Analyzing the challenges of creating an effective PIA tool provides opportunities for ensuring an overall risk management initiative for addressing privacy risks.

BACKGROUND

Defining Privacy

A review of two public dictionary definitions of privacy provide a general idea of the term and shed some light on how each slightly differs in how privacy is defined. *Merriam-Webster* defines privacy as either "the quality or state of being apart from company or observation" or "freedom from unauthorized intrusion" **(**Merriam-Webster n.d.**).** The *Oxford English Dictionary* defines privacy as a "state in which one is not observed or disturbed by others" (Ask Oxford n.d.**).**

From a business perspective, the American Institute of Certified Public Accountants (AICPA) and the Canadian Institute of Chartered Accountants (CICA) Generally Accepted Privacy Principles define privacy as "the rights and obligations of individuals and organizations with respect to the collection, use, disclosure and disposal of personal information (AICPA CICA, 2009)." For the purposes of this paper, the following definition for privacy is used by the case study, "The appropriate use and disclosure of Personally Identifiable Information (PII) under the circumstances." What is appropriate will depend upon laws, individual's expectations and the right of an individual to control the collection, use and disclosure of PII (West Virginia Healthcare Authority, 2009).

What is PII?

All information that identifies, or can be used to identify, locate, contact, or impersonate a particular individual. PII also includes Protected Health Information (PHI). PII may be contained in public and non-public records. When connected with one or more items of information specified in the following paragraph and any other information concerning an individual, the combination of information can be used to identify a specific individual physically or electronically. Some examples of PII:

> May include but are not limited to a specific individual's: first name (or initial) and last name (current or former); geographical address; electronic address (including an e-mail address); personal cellular phone number; telephone number or fax number dedicated to contacting the individual at his or her physical place of residence; social security account number; credit and debit card numbers; financial records, including checking, savings and other financial account numbers, and loan accounts and payment history; consumer report information; mother's maiden name; biometric identifiers, including but not limited to, fingerprints, palm prints, facial recognition, full face image and iris scans; driver identification number; birth date; birth, adoption or death certificate numbers; physical description; genetic information; medical, disability or employment records, including salary information; computer information, including information collected through an Internet Cookie; and criminal records and history (West Virginia Healthcare Authority, n.d.).

The Foundational Principles of *PbD*

Ontario's Information and Privacy Commissioner, Dr. Ann Cavoukian, developed the concept *Privacy by Design* (*PbD*) in the early 1990s. According to Dr. Cavoukian (2010), *PbD* can be described as the idea of embedding privacy at the beginning of designing specifications of information technologies, business processes, physical spaces, and networked infrastructures. The concept of *PbD* can be defined as the new generation of privacy protection which focuses on a proactive, holistic approach to protecting the privacy of individuals. Generally, other privacy protection concepts are associated with reactive approach frameworks which cover reactions for privacy breaches occurring in information technology application. Reactive approach, based mostly on legal compliance is not sufficient enough in the era of rapid pace of technological progress and changes (Cavoukian, 2010). Cavoukian (2010) outlines seven *PbD* Principles as follows: 1) Proactive not Reactive - Preventative not Remedial. This principle considers privacy at the outset of the project, not only as a reaction to a breach or other data protection issue; 2) Privacy as the Default Setting. This principle focuses on the protection of individuals' privacy as the primary concern; 3) Privacy Embedded into Design. This principle considers privacy when designing a new tool or technology; 4) Full Functionality – Positive-Sum, not Zero-Sum. This principle suggests accommodating all interests in a harmonious way, instead of dismissing privacy in favor of innovation, or vice-versa; 5) End-to-End

Security – Full Lifecycle Protection. This principle considers the protection of personal data throughout the product lifecycle; 6) Visibility and Transparency – Keep it Open. This principle seeks to ensure being transparent about the adopted approach to privacy; and 7) Respect for User Privacy – Keep it User-Centric. This principle requires keeping the product or service user-centric; for example, keep the interests of the individuals in mind.

What Is A PIA?

The definition of a PIA has been described is various ways, comes in different sizes, and reflects a wide range of objectives. However, a PIA is basically a tool used to assess the privacy impact and risks to PII stored, used and exchanged by information systems. A PIA evaluates privacy implications when information systems are created, when existing systems are significantly modified or when new technology is purchased (West Virginia Healthcare Authority, 2015). According to the Office of Management and Budget (OMB) (2003) a PIA is defined as:

> An analysis of how information is handled: (i) to ensure handling conforms to applicable legal, regulatory, and policy requirements regarding privacy, (ii) to determine the risks and effects of collecting, maintaining, and disseminating information in identifiable form in an electronic information system, and (iii) to examine and evaluate protections and alternative processes for handling information to mitigate potential privacy risks (OMB, 2003).

Wright (2011) proposes that "…the concept of a PIA emerged and matured during the period 1995 to 2005." The following countries; Australia, Canada, New Zealand, the UK and the United States are primarily using PIAs. Although PIAs seem to be used most often by governments, some private sector organizations also use PIAs, but there is little information available on which companies are using them, the extent to which they are used and whether their process is as thorough or as rigorous as the government institutions in the countries listed previously. In additional, the International Organization for Standardization (ISO) has produced a standard for PIAs in financial services (Wright, 2011).

While it is mandatory for a few countries, it mostly remains merely a recommended process for meeting privacy protection compliance. However, in the United States, federal agencies are required to conduct PIAs under the E-Government Act of 2002 for government programs and systems that collect personal information online. Federal agencies such as the U.S. Department of Homeland Security and the Department of Health and Human Services offer guidance for writing PIAs, such as providing blank PIA privacy impact assessment templates to assist and facilitate their development (Wright, 2011).

PIAs provide numerous benefits, such as: a) providing a proactive approach to privacy management; b) evaluating whether appropriate privacy protections and necessary mitigation or safeguards are present; c) applying privacy requirements, complementing organization-wide compliance activities; d) enhancing current data inventories of information collected, used, stored and exchanged by systems; and f) Providing opportunity for additional education and awareness (West Virginia Healthcare Authority, 2015).

The Intersection of *PbD* and PIA

The PIA concept focuses on how an organization complies with legislative and regulatory requirements. Therefore, a PIA process can be described as a due-diligence exercise that assesses the impact of new technologies on individual's privacy rights. On the other hand, *PbD* assumes a holistic approach by transforming how an organization manages the privacy from policy and compliance to an organization-wide business issue and strategy (Cannon, 2014; Cavoukian, 2010; Wright, 2011). Both the *PbD* and PIA concepts are complementary models for incorporating privacy of individuals into design, development and deployment of systems deals with personal information. If you conducted an internet research on PIAs, you will also frequently see resource materials for *PbD*.

The PIA Experience in State Government

In 2006, the Governor of the state of West Virginia directed a state agency to establish a State Privacy Office (SPO) to oversee an executive branch privacy program. From this directive, an enterprise-wide Privacy Management Team (PMT) was established. The PMT is comprised of Privacy Officers from 12 Executive Branch

Departments, as well as others who lend their expertise to support the team's objectives. The SPO and PMT work together to develop privacy policies and procedures for the Executive Branch Departments. The overall goal of the privacy program is balancing an individual's right of privacy against others' need and right of access to personally identifiable information (PII). The privacy program and policies are based upon six privacy principles, consistent with law and policy. Table 1 briefly summarizes each of the six principles.

Table 1. **Executive Branch Privacy Principles**

Term	Description
Accountability	Each Department shall assign roles and responsibilities to ensure application of privacy principles to PII.
Consent	Each Department shall provide individuals with a reasonable opportunity to object to the collection, use or disclosure of their PII.
Individual Rights	An individual should be afforded the ability to access and copy his or her PII that a Department acquires or maintains, request an amendment of the information an entity maintains and, if such amendment is not undertaken, request that the information be notated.
Minimum Necessary and Limited Use	Departments shall limit the collection and disclosure of PII to their legal authority. Additionally, Departments should only collect or disclose those elements of PII that are reasonably needed to accomplish a legitimate Departmental objective, except where law or public policy directs otherwise.
Notice	Departments shall be open regarding the authority for collecting PII, the purpose of the collection, the location of the entity maintaining the PII, with whom the PII may be shared and why, rights an individual has to PII, and the Department's policies, procedures, standards and practices with regard to PII.
Security Safeguards	Departments shall implement the appropriate management, operational, physical and technical controls to preserve the privacy, confidentiality, integrity and accessibility of PII. The security safeguards shall be designed to protect the PII from (i) anticipated threats of hazards and (ii) unauthorized access, use or disclosure.

Source: The West Virginia State Privacy website: www.privacy.wv.gov

These principles are important to understand because of how they influence the process by which the PIA process was designed and implemented. The primary goal of the PIA process was on how to effectively decrease privacy risks and unauthorized access to PII. The ultimate goal is to foster trust between state government and the citizens of the State. Thus, the PIA was designed to assess the privacy impact and risks to PII stored, used and exchanged by information systems. According to Wright (2011), the PIA process can help reduce liability, negative publicity and loss of reputation. However, Wright (2011) emphasizes PIAs should be not be considered as simply legal compliance checklist or considered to be a privacy audit that assess existing information systems. Implementing a PIA process can help an organization demonstrate compliance with federal and state laws in the event of a privacy audit or complaint.

Designing a State Government PIA Program

From April 2014 to June 2015, the State Privacy Office (SPO) and the PMT were task with implementing a PIA program for all 12 executive branch departments. A workgroup was formed which consisted of privacy officials, legal professionals, SPO staff, and information technology professionals. The first priority of the workgroup was to conduct extensive reviews of existing PIA programs and best practices. The workgroup reviewed PIA programs in both the public and private sectors. Once the literature and program reviews were completed, the workgroup began the complex process of defining components of the PIA tool, guidance document, and training needs. The challenge for the workgroup was to ensure that the PIA program considered both federal and state laws and regulations regarding the protection of PII.

The approach to designing the PIA Tool was based upon the six privacy principles and the information lifecycle (ILC). According to Cannon (2014), the ILC is the process data goes through, starting with acquisition and ending with its disposition. Examples of ILC phases include: 1) collection of data into the department; 2) use of data when the department processes the data in any way; 3) disclosure, sharing or onward transfer of data to third parties; 4) retention of data beyond the initial collection; and 5) destruction of data in a way that renders it unreadable (for paper records) or irretrievable (for digital records).

A web-based PIA tool was developed and refined into three sections. Section one asks for demographic information such as contact information for individual completing form, brief description of the project and department contact information for their privacy and security officials. Section two defines the privacy threshold analysis (PTA), which is built into the PIA, to determine if the new project, program, or system has privacy implications and if there is a need to complete the full PIA. Section three is the full PIA process with questions related to data collection, use, storage, disclosure (sharing), security controls.

The PIA process involves the evaluation of broad privacy implications of projects and relevant privacy laws and policies. When potential privacy risks are identified, a review is undertaken to find ways to avoid or mitigate these risks. There are five stages in the PIA process. Step one is identifying the need for a PIA. The system owner and or program manager from the department would complete the PTA to determine if PII is process by any of the system's components. If answers to the qualifying questions are no, then a PIA is not warranted. If any of the answers are yes, the tool prompts the user to go to step two which is describing the project's information flows and completing the full PIA. Once step two is completed a report is auto generated and sent through email to the user, Department Privacy Officer (DPO) and SPO. Step three is the process of identifying risks. The DPO is responsible for reviewing the report to identify privacy risk from the information provided in the PIA report. If there are any privacy risks, the DPO would continue with steps four and five. Step four is the process of identifying and evaluating privacy solutions. The system owner and or program manager and DPO would collaborate to reach an agreement on resolving any identified privacy or security risks. Step five is the process of creating a summary report of identified risks and resolutions.

In conjunction with the PIA tool, a guidance document was developed to serve as an educational resource and best practice guide for all of the executive branch departments to efficiently and properly perform PIAs. This guide illustrates when to conduct a PIA and the steps needed to support and assist departments in PIA preparation and implementation activities. Once the PIA tool and guidance document were finalized, training was developed for specific department workforce members. Training attendees were provided with the expertise and knowledge on how the PIA process was designed, how the PIA incorporates privacy principles, how the PIA supports *PbD*, and how to properly complete a PIA. The training also provided best practices for identifying privacy risks and vulnerabilities associated with the project as well as how to appropriately mitigate these risks.

CONCLUSION

In the initial PIA implementation stages, there was the tendency for some departments to have a cautious approach to the PIA process. In the past, concerns were primarily related to budget costs and ensuring proper security controls when developing new IT systems. However, collaborating with privacy professionals resulted in a balanced approach to data protection and privacy policy compliance. The executive departments are finding the PIA process to be a great privacy protection tool (Personal communication, July 31, 2015).

One challenge for the executive departments is realizing the PIA report is not an end in itself and will not generally lead unaided to better privacy outcomes. New technologies enable the collection of more data. Thus, it is

important to consider privacy at each stage of new IT system development. System owners and or program managers who complete PIAs may often operate under significant constraints and are subject to many pressures that may prevent them from achieving as much with the PIA process and reports as others might expect. However, the PIA report can provide useful information for department leaders to use where project designs are formed and where decisions on whether, when and how to implement new IT systems are made. As proposed by Cavoukian (2010), "…organizations must have the philosophy of embedding privacy proactively into technology itself."

Exploring the unfolding process of PIA implementation lends itself to a deeper knowledge of how privacy policy is enacted internally. Within the context of West Virginia State government protecting privacy refers to protecting PII from loss, theft or misuse while simultaneously supporting the overall mission. Protecting PII encompasses a variety of ever-changing and interrelated activities from policy development, implementation, and review; to incident prevention, monitoring, and management; to stakeholder collaboration, and education and awareness. Protecting PII requires great diligence, being proactive, and ensuring accountability. Data Protection requires privacy compliance to be embedded throughout West Virginia State government, not only through privacy awareness training and privacy policies, but, through privacy impact assessment to support *PbD*.

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LEGALIZATION OF AN OPEN MARKET SYSTEM FOR THE PURCHASE AND SALE OF TRANSPLANTABLE KIDNEYS: ETHICAL, POLITICAL, AND SOCIAL ISSUES

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ABSTRACT

According to the United Network for Organ Sharing (UNOS), there are in excess of 100,000 candidates waiting for a kidney transplant in the United States. Under the Organ Procurement and Transplantation Network (OPTN) contract with the U.S. Department of Health and Human Services, UNOS must maintain a centralized computer network linking all organ procurement organizations and transplant centers. The demand for transplantable kidneys far outweighs the supply. Unfortunately, this supply-demand disparity gives rise to illegal, unethical, and unregulated black market opportunities for the purchase and sale of transplantable kidneys. The World Health Organization (WHO) estimates that organ trafficking accounts for five to ten percent of all kidney transplants worldwide (Suddath & Altman, 2009). In addition, approximately 63,000 transplantable kidneys were obtained in organ bazaars of Africa, Asia, Eastern Europe, and South America (Satel, 2010). However, as a recent kidney transplant recipient who waited 7 years for a viable, cadaverous, and available kidney match, one author can speak first-hand about the fear, frustration, and anticipation of waiting on "The List" to receive a telephone call that a transplantable kidney had become available. For many, this ordeal lends credence to the argument that, under "perfect" circumstances, the purchase and sale of a transplantable kidney may become a viable alternative in the near future.

A significant variable in the organ procurement process is the nature and function of the processes currently used to determine availability and matching of kidney donors to recipients. This presentation will bring to light current organ procurement systems and policies in the United States, some of the ethical, political, and social issues surrounding the implementation of an open market system for the purchase and sale of transplantable kidneys, and the debate for the legalization of such a system.

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TRACK
HEALTH AND WELLNESS

ARTHRITIS AND CORONARY HEART DISEASE DYAD: HEALTH-RELATED QUALITY OF LIFE AND HEALTH CARE UTILIZATION AMONG U.S. ADULTS

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ABSTRACT

Background: *Arthritis is one of the most common chronic conditions among U.S. adults. According to 2010-2012, National Health Interview Survey, about 52.5 million adults have physician-diagnosed arthritis. About 24% of adults with arthritis have coronary heart disease (CHD); hence, the leading co-morbid condition and reason for mortality in this population. With the rise in multiple chronic conditions, the need to better manage population health, and control cost of care, it is imperative we start addressing co-morbid conditions among individuals with arthritis instead of providing care centered on single chronic condition. Although, it is known that individuals with arthritis have poor health-related quality life (HRQOL) compared to the general population, we have limited knowledge on the combined impact of arthritis and CHD adults' HRQOL, and health care utilization.*

Objectives: *To determine the health-related quality of life and health care utilization for adults with arthritis and CHD as co-morbid conditions when compared to adults with arthritis and no CHD as well as those with no chronic health condition.*

Methods: *The study has a retrospective pooled cross-sectional design. We combined data from 2008-2013 Medical Expenditure Panel Survey (MEPS) for adults ≥ 45 years old. Our study cohort includes adults with arthritis and coronary heart disease (CHD) (n=4,130). We compared HRQOL and health care utilization for the study cohort with adults who had arthritis but no CHD (n=22,855) and those who did not report any chronic health condition (n=26,811). HRQOL was measured based on Short Form Version 12 (SFv12) questionnaire's physical and mental component scores. Health care utilization was measured as the number of office based physician visits, emergency department (ED) visits, and inpatient admissions. We used Kruskal Wallis with Tamhane's T2 Posthoc to test for group differences. Sampling weights were used to account for MEPS' complex sampling design.*

Results: *The study cohort had about 52.7% males, 9.7% African Americans, 7.0% Hispanic, 73.0% were either overweight or obese, 17.0% resided in non-metropolitan statistical areas, about 40.0% resided in Southern US region. The mean (±SD) age was 70.66(±10.4) with at least one additional health condition in addition to arthritis and CHD. The adults diagnosed with arthritis with no CHD as well as with no reported chronic health conditions cohort were younger, 60-69% overweight or obese and 13-15% lived in non-metropolitan statistical areas. The mean physical and mental component scores for the study cohort were 34.4(±11.8) and 48.6(±11.8), respectively as compared to 41.4(±12.3) and 50.3(±10.91) in arthritis and no CHD cohort, and 52.1(±7.85) and 52.7(±8.64) in the cohort that did not report any chronic health condition. Visits to physicians 9.91(±10.05), ED 0.45(±0.84), number of inpatient admissions 0.44(±0.84) were higher for the study cohort as compared to arthritis and no CHD cohort and with no reported chronic health condition respectively. Results from Kruskal Wallis showed that the three groups had statistically significant differences on measures for HRQOL and health care utilization. For the study cohort, physical component scores were on average lower, when compared with arthritis and no CHD cohort (6.91) and cohort with no chronic health conditions (17.77). Similarly, the study cohort's mental component scores were on average lower than arthritis and no CHD cohort (2.40) and cohort with no chronic health conditions (5.44).*

The number of office based visits was on an average higher, when compared with arthritis and no CHD cohort (3.01) and cohort with no chronic health conditions (7.01). ED visits were higher for study cohort than arthritis and no CHD cohort (0.21) and cohort with no chronic health conditions (0.37). Similarly, inpatient admissions were higher than arthritis and no CHD cohort (0.26) and cohort with no chronic health conditions (0.31).

Conclusion: *Adults with arthritis and CHD had additional health conditions, poor HRQOL, and higher health care utilization. Our study emphasizes the need to address multiple chronic conditions through joint management guidelines for co-morbid conditions, and case management for high healthcare utilizers.*

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PREVALENCE OF RISKY AND VIOLENT BEHAVIORS AMONG HIGH SCHOOL STUDENTS: EXAMINING GENDER AND RACIAL DIFFERENCES

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ABSTRACT

United States has the highest prevalence of gun violence in school and also leads in indicators including substance abuse, high-risk sexual behaviors and teen pregnancies. Data from Youth Risk Behavior Survey administered in 2013 were analyzed and comparisons were made between race and gender. The purpose of this study was: a) to evaluate significant differences in youth risk behaviors by gender; and b) to evaluate the type of behaviors that are at greater risk within each race. Data from 1991 – 2013 were used for analyzing trends data. With regard to race, comparisons were made between African Americans and Caucasians since the sample size of other races was insignificant to be used for analysis. Some of the behaviors used in this study include: Substance abuse (alcohol, tobacco, marijuana), involving in physical fight (on and off-campus), carrying a weapon (on and off-campus), suicidal tendencies, and bullying in school. Mean scores, 95% confidence intervals and t-tests were used for data analyses. Results of data analyses and discussion points will be presented in this paper. Understanding the prevalence and trends in risky behaviors among high school students will help in developing tailored interventions to promote health as well as preventing school violence.

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PATIENT-CENTERED MEDICAL HOME: IMPLICATIONS FOR POPULATION-BASED HEALTH

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ABSTRACT

Population health management is a key component of the Patient-Centered Medical Home (PCMH) model. It requires health systems and physician practices to regard patients as individuals and as members of a population. Doing so allows a provider to identify the most important health needs of its patient population, and determine how best to prevent or meet community needs. Population health management involves a proactive, team-based approach to care that focuses on prevention, early intervention, and close partnerships with patients to tightly manage chronic conditions. The PCMH model allows providers to proactively oversee patients who need preventive care and monitor those with multiple chronic diseases. This is done by utilizing health data which is collected and stored in patient registries. It also provides planned care and outreach along with the incorporation of integrated behavioral health care. Finally, the PCMH model allows providers to monitor patient progress, identify appropriate care plans, and recommend changes to care plans by including reminders in the electronic health record. The model allows for evaluation of practice and system performance by tracking patient data and comparing it with national benchmarks.

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CHARACTERISTICS OF INDIVIDUALS WHO ACCESS HEALTH CARE AT A FULL VS. PARTIAL PATIENT CENTERED MEDICAL HOME: A PATIENT PERSPECTIVE

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ABSTRACT

Background: *The patient-centered medical home (PCMH) has been promoted and supported by the Affordable Care Act. It is a model of high-quality primary care delivery by which patient treatment is delivered by a team of health care providers led by the physician to ensure that care is accessible, coordinated, comprehensive, safe, and meets the needs of the patient. Hence it is expected to improve health care quality, enhance patient experience, and reduce costs. Individuals with chronic diseases are the ones who need the PCMH the most given their frequent use of health care services.*

Objective: *The purpose of this study is to examine the characteristics of individuals who access health care at a full versus partial PCMH from patients' perspective.*

Methods: *This study used pooled cross sectional data from the Medical Expenditure Panel Survey (MEPS) from 2008 to 2013. The MEPS data set is built based on a complex survey design that uses weights to correct for non-response bias and provides an estimate of the US national sample. Our sample consisted of all American adults ≥18 years old who have a usual source of care (n = 103,676; weighted n= 174,630,895). A usual source of care consists of a particular doctor's office, clinic, health center, or other place that the individual usually goes to if he/she is sick or needs advice about health care. We constructed a dichotomous dependent variable coded "1" if the individual has access to a full PCMH and coded as "0" if the individual has access to a partial PCMH. Individuals had access to a full PCMH if they consistently answered "yes" to the twelve questions associated with care coordination; respect for the patient's choice of treatment and decision; use of their USC for routine care, preventive care, referrals and ongoing problems; and whether the provider is not far from home and easily accessible on the phone, late at night, and during the weekend. Individuals had access to a partial PCMH if they answered "no" to any of these questions. We controlled for variables that may affect access to PCMH including age, race, ethnicity, marital status, sex, employment status, level of education, total personal income, insurance coverage, region, MSA as well as 10 chronic health conditions (high blood pressure, coronary heart disease, other heart disease, stroke, emphysema, high cholesterol, diabetes, arthritis, asthma, and cancer), overall physical health status, and overall mental health status. A summated score of the ten chronic health conditions was used in the analysis. We used weighted logistic regression, based on the weight associated with the self-administered questionnaire provided by MEPS, to examine the individuals' characteristics associated with access to full vs. partial PCMH.*

Results: *Our sample consisted of individuals between 18 and 24 years old (10%), between 25 and 44 (30%), between 45 and 64 (38%), and between 65 and 85 (22%). Eighty-two percent of the respondents were Caucasians, 11% African Americans, 5% Asians, and 3% others. In addition, 11% were Hispanic, 57% married, 61% employed, 55% female, 9% uninsured, 72% privately insured, and 19% publicly insured. Thirty one percent of our sample had at least a bachelor's degree, another 29% had some college education, and 27% graduated from high school or had a general education diploma. Eighty-four percent of our sample resided in metropolitan statistical areas. The average annual income level was $37,000 and the average number of chronic health conditions was 2. Among individuals with USC, 89% had a partial PCMH and 11% had a full PCMH.*

The results from our logistic regression indicated that compared with individuals between 18 and 24 years old, individuals aged between 25 and 44 (OR=0.85, p<.10), individuals aged between 45 and 64 (OR=0.72, p<.001) as well as individuals aged between 65 and 85 (OR=0.56, p<.001) were less likely to have a full PCMH. Compared with individuals without health insurance, publicly insured individuals were less likely to have a full PCMH (OR =0.81, p<.05). Compared to Caucasians, African Americans were more likely to have a full PCMH (OR=1.25, p<.01). Compared with singles, married individuals were more likely to have a full PCMH (OR=1.28, p<.001). Compared with an individual without any kind of physical or cognitive limitation, an individual with any limitation was less likely to have a full PCMH (OR=0.73, p<.001). Compared to an individual who resided in the western region of the United States, an individual who resided in the Northeast (OR= 1.31, p<.05) and the Midwest (OR =1.27, p<.10) were more likely to have a full PCMH.

Conclusions: *A full PCMH has been thought to be the ideal model of health care delivery to ensure high quality care that is coordinated and patient-centered. However, our sample shows that only 11% of individuals who have a usual source of care have access to a full PCMH. In addition, our findings indicated that age and having any kind of physical or cognitive limitations were negatively associated with the odds of having a full PCMH. When people grow older, they tend to have multiple chronic conditions coupled with some physical or cognitive limitations. Therefore, the provision of full PCMH is important for older people because they use health care services more frequently than younger individuals. In addition, our findings suggest that individuals who have public insurance are less likely to have a full PCMH. Given the increased number of individuals who possess public health insurance as a result of the Affordable Care Act, USCs that provide care for individuals with publicly funded health plan should be encouraged to enhance their services towards the attainment of full PCMH status. Our findings indicate that African Americans tend to have full PCMH compared to Caucasians. This finding may suggest that USCs are aware of racial disparities in experience of care and have taken the initiative to accommodate minorities. However, these efforts should not be deployed at the expense of Caucasians. Everyone should have access to full PCMH equally, regardless of race or ethnicity. Our results also indicate that there are some regional variations in PCMH. USCs in the West should be encouraged to provide full PCMH services. Given that we used cross-sectional data, the interpretation of our results is limited to the assessment of the association of the independent variables with having a USC, or a full vs. partial PCMH; we could not infer causality. And finally, since the Affordable Care Act was fully deployed in 2014, we were not able to assess the impact of the Affordable Care Act on PCMH experience, which should be the focus of future studies.*

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PRESCRIBING BEHAVIOR AMONG PRIMARY CARE PHYSICIANS FOR TREATMENT OF INFLUENZA

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ABSTRACT

Accurate diagnosis and treat of influenza are essential to ensure containment and reduce transmissibility. The illness affects children, healthy adults, and the elderly differently therefore physicians must be fully knowledgeable regarding appropriate treatment, one being antiviral medications. The aim of this research is to identify factors such as age, race, gender, type of medical facility, geographical location, and other factors that are associated with prescribing behavior of antiviral medications among primary care physicians for treatment of influenza.

Data were obtained from the National Ambulatory Medical Care Survey for each influenza season between the years of 2009-2012. The study included data with a primary diagnosis of influenza and no secondary bacterial complication. Bivariate analyses and two models of multivariate logistic regression analyses (one with no fixed effect and the other including year as a fixed effect) were used to analyze the data.

The results from this study indicated that among family practice physicians, 45.7 percent prescribed antiviral medications to patients who tested positive with influenza while 54.3 percent prescribed another type of medication. Antibiotic prescriptions comprised 46.2 percent of the prescriptions for treatment of influenza. Multivariate logistic regression analyses revealed that race (White; $p = 0.034$), employment status (owner; $p = 0.05$), metropolitan location (metropolitan statistical area; $p = 0.028$), and geographical location of health facility (Midwest; $p = 0.05$) were all significantly associated with prescribing antiviral medications.

By analyzing more recent data regarding physicians' prescribing practices, a more timely diagnosis can occur and more effective treatment of influenza can be provided. The findings suggest that efforts should be targeted to increase physician education and awareness of influenza. Appropriate interventions may significantly improve prescribing of antiviral medications and reduce the number of inappropriate medications such as antibiotics.

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REDUCING INFLUENZA IN VULNERABLE COMMUNITIES

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ABSTRACT

Current research illustrates the benefits of vaccinating high-risk populations against highly communicable diseases like influenza. With such information in mind, this study seeks to assess the vaccination status of individuals belonging to two vulnerable communities within Topeka, Kansas. The target population in this study includes transient residents of a homeless shelter and low-income individuals who live in an economically disadvantaged neighborhood. The study also aims to identify barriers of receiving vaccinations in an effort to address these barriers and ultimately increase vaccination rates within these vulnerable communities.

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SUPPORTING AFRICAN AMERICAN MOMS TO INITIATE AND INCREASE THE DURATION OF BREASTFEEDING IN DEKALB COUNTY, GA—IT TAKES A SISTERHOOD

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ABSTRACT

Research shows that breastfeeding provides health benefits for infants' and children's health (lower rates of gastrointestinal problems, ear infections, lower respiratory tract infections, diabetes, and obesity) as well as for the health of the mothers (easier return to prepregnancy weight, decreased risk of breast and ovarian cancer in the prememopausal period, and of hip fractures and osteoporosis in the postmenopausal period) The population of DeKalb County, Georgia is 55% African American, 26% Caucasian, 10% Hispanic, 6% Asian, 2% of two or more races, and 1% are American Indian/Alaska Native. A 2014 survey in Georgia documented that 70.9% of mothers and babies initiated breastfeeding while only 38.4% were breast fed for at least six months. This study also revealed that the proportion of African American mothers who were breastfeeding their infants at hospital discharge after delivery was 20% lower than Caucasian mothers. In response to this information, the DeKalb County Board of Health is initiating the "DeKalb Healthy Start through Breastfeeding Initiative", focusing on increasing breastfeeding initiation and duration among African American mothers and their infants.

As part of this Initiative, Clayton State University students and their professor conducted key informant interviews on behalf of the DeKalb County Board of Health's Health Assessment Program (HAP) with breastfeeding advocates, leaders, and educators serving DeKalb County residents. The respondents expressed concerns that the WIC Program of DeKalb County is no longer as effective in supporting prenatal and postpartum mothers with their breastfeeding. To validate or invalidate this concern, the students also conducted interviews with prenatal and postpartum African American and Hispanic WIC clients. Moreover, the students and their professor were also called upon to visit the best-in class "Breastfeeding Friendly Businesses Program" of Coffee County, Georgia, to assess best practices as well as program development lessons learned in support of DeKalb County's Initiative.

The results of these sub-studies are shared in this paper, as well as the specific evidence-based recommendations provided to the DeKalb County Board of Health for strengthening the Breastfeeding Coalition of the County.

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TRENDS AND DETERMINANTS OF CONTRACEPTIVE METHOD CHOICES: EVIDENCE FROM AN EMERGING ECONOMY

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ABSTRACT

Diaz et al. (1999) pointed out that the central element of quality of care in the provision of family planning services is "contraceptive choice" and it's an important dimension of a women's reproductive rights. As family planning programs are becoming more and more established and contraceptive prevalence is increasing to a considerable level, it is important to carefully study the dynamics of contraceptives, including method choice and type. Bangladesh, a country in South-Asia has gradually achieved tremendous success in terms of family planning and sanitation after its independence. In Bangladesh, Contraception is the most widely used practice espoused by the couples not only to restrict the number of children born but also to control the interval between births. This study is conducted to identify the trends in the socio-demographic profile of users of different contraceptive methods and types among the women aged between 10 to 49 years in Bangladesh using four rounds of Demographic and Health survey data collected in 2000, 2004, 2007 and 2011. It also examines the socio-demographic factors influencing contraceptive method choices and types in Bangladesh. Simple bivariate analysis has been to examine the trend in the profiles of users of different contraceptive methods by choices and types. Finally A multinomial logistic regression model has been fitted to identify the factors associated with contraceptive method types in Bangladeshi women. The results showed that, mostly women aged between 20 to 35 years uses contraceptive methods. Younger women tend to use modern methods compared to older women. Older women use either traditional methods or no methods. The results also shows that with increase in educational level, the use of contraceptives and modern methods increases. Religion plays a role showing that Muslim women are less likely to use ant contraceptive methods compared to Hindu and Christian women. The rural/urban differentials in contraceptive use is declining. In past, rural women were less likely to use modern methods but the situation has improved though not satisfactory yet. Ideal family size has negligible impact on method choices and types. The results also pointed out that women with no or 1 children most uses modern methods while women with more than 2 children tend to use traditional methods. The use of folkloric methods is declining over the years. The study has important policy values as it can help the government to develop suitable policies depending on the different socio-demographic profiles of the women.

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BAREFOOT, PREGNANT AND (NOT VERY) HAPPY: MANAGEMENT AND HEALTHCARE REASONS FOR PAID PARENTAL LEAVE IN THE U.S.

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BAREFOOT, PREGNANT AND (NOT VERY) HAPPY: MANAGEMENT AND HEALTHCARE REASONS FOR PAID PARENTAL LEAVE IN THE U.S.

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ABSTRACT

Twenty-two years ago, the Family and Medical Leave Act (FMLA) was enacted to require employers to provide twelve weeks of unpaid and job protected leave for the birth or adoption of a child, and for those dealing with a seriously ill relative. Due to the increasing number of women entering the workforce, the financial exigencies wrought by the Great Recession, and changing attitudes among younger generations who want a greater work-life balance, the main problems with the FMLA are its exceptions and, quite bluntly, the fact that many workers simply cannot afford to take a leave. This paper will provide a brief overview of the FMLA's flaws, why it is now necessary to correct them, and primarily concentrate on issues related to the birth of a child versus adoption and dependent care coverage as provided in the Act. Furthermore, this paper will examine recently proposed legislation and provide other recommendations for future improvements.

BACKGROUND

In 1993, President Clinton signed the Family and Medical Leave Act (FMLA) which requires employers to grant 12 weeks of unpaid and job-protected leave for the birth of a child, the adoption of a child, and employees dealing with a seriously ill relative. This paper will specifically address the parental leave issues that have emerged since the passage of this Act.

In light of the changing demographics of the U.S. workforce and, inarguably, how many forms of work itself have changed, the FMLA was a well-intentioned and long overdue piece of legislation. However, the FMLA's exceptions – namely, the exclusion of all part-time workers, the exclusion of workers who have not been with their company for at least a year, and the exclusion of anyone working for a company with fewer than 50 workers – have worsened rather than improved the Act's efficacy. Perhaps most importantly, the FMLA grants only unpaid versus paid parental leave in addition to these restrictions. This omission has led the United States to be seen as shameful among national and international policymakers.

For example, one author cited the United Nations' International Labor Organization's analysis of 185 countries and territories with available data. In that analysis, of the 185, all but three – Oman, Papua New Guinea and the United States – provide cash benefits to women during maternity leave; these three outliers provide some form of maternity leave but have no overall law for cash benefits (Kim, 2015). Furthermore, the United States is the only developed country that does not offer paid parental leave (Popovich, 2015). In another startling article, one author illustrated ten charts culled from analyses conducted by the International Labor Organization, the U.S. Department of Agriculture, the McGill Institute for Health and Social Policy, and a combined study from the Pew Research Center and the Organization for Economic Cooperation and Development (OECD), among others, to conclude that the United States ranks last in every measure of family policy (Schulte, 2014).

Since the FMLA was passed, the federal government has not revised it but some individual states have taken action. At this writing, three states – California, New Jersey and Rhode Island – provide different levels of basic paid leave for their residents using a minimal payroll tax to cover expenses; in New Jersey, for example, the payroll tax deduction is a very modest 1.2 percent (Pressman and Scott, III, 2014). California was the first state to offer the country's first paid parental leave law, and "[It is] open to both mothers and fathers. There, new parents get up to six weeks off at 55 percent of their current paycheck, up to about $1,000 a week" (Suddath, 2015, p. 56). Not surprisingly, California's law was criticized with harsh skepticism and fierce opposition by businesses that

labeled it a "job killer;" however, according to Christopher Ruhm, a professor of public policy and economics at the University of Virginia, "businesses in California don't seem to be reporting a strong negative effect. I haven't seen evidence of a significant downside" (Ibid., 2015, p. 57). State legislators and policymakers interested in learning how California's law was designed and measured would benefit from reading Appelbaum's and Milkman's commentary that traces what happened before, during and after the law's passage (Appelbaum and Milkman, 2011 in Pressman and Scott, III, 2014).

Within the private sector, the response to the need for paid parental leave has been lackluster. In an examination of private industry's involvement in offering paid leave over the last 20 years, an author for the Bureau of Labor Statistics (BLS) described how the BLS conducted its analysis. Using the Employment Benefits Survey, paid maternity leave and paid paternity leave were captured separately. In 1992, only two percent of workers received paid maternity benefits and one percent, paid paternity benefits. Recently, the author noted that the definition of family leave was expanded in the BLS's National Compensation Survey to include additional types of leave, such as leave to care for family members. Paid family leave in 2012 was available to 11 percent of all workers and 15 percent of workers in medium and large organizations. As the pattern was with access to other leave benefits, only four percent of part-time workers and eight percent of workers in small establishments had access to the benefit in that year (VanGiezen, 2013).

The definition of family leave has undergone significant changes over the last 20+ years. However, its funding and expansion have not been addressed. Although there are numerous reasons for accepting or rejecting family leave as a critical workforce benefit, the following management and healthcare issues will provide some reasons for its acceptance.

MANAGEMENT ISSUES

It is common knowledge that most U.S. working women return to work sooner than they'd like to do so, and sometimes just weeks or days after having a baby. As noted by one author, "Just how soon they're going back [to work] is difficult to determine. We know that most employers don't offer paid leave, but no federal agency collects regular statistics on how much post-childbirth time off, paid or unpaid, women are actually taking" (Lerner, 2015, p. 2).

According to the Department of Health and Human Services' Maternal and Child Health Bureau, in 2006-2010, 66.0 percent of women reported being employed during their last pregnancy, of whom 69.7 percent reported taking maternity leave. Thus, nearly one-third of employed women did not report taking any maternity leave (30.3 percent). Women with at least a college degree were more likely to have taken leave than those who had attended college but not graduated (80.0 versus 71.6 percent, respectively) while less than half of women without a high school degree reported having taken leave. Hispanic and non-Hispanic Black women were less likely to report having taken maternity leave than non-Hispanic White women (62.5 and 64.3 percent, respectively, versus 72.2 percent). When taken, the average length of maternity leave was 10.0 weeks (HRSA U.S. Department of Health and Human Services Maternal and Child Health: Maternity Leave: Women's Health USA, 2013). It is important to note that one source that contributed to this study observed that many women cannot afford to take unpaid leave and usually use a combination of short-term disability, sick leave, vacation, and personal days in order to have some portion of their maternity leave paid (Institute for Women's Policy Research Fact Sheet: Maternity, Paternity, and Adoption Leave in the United States, 2011).

The aforementioned study is instructive. First, one-third of its sample did not report taking <u>any</u> maternity leave, and one reason may include the absence of pay as shown in the "patch-working" of their other benefits that provide some financial relief. One author noted that even women in high-income positions have trouble figuring out how this patchwork of policies applies to them (Suddath, C., 2015). Secondly, women who are college educated may have more financial resources such as more stable jobs and higher pay than non-college educated women who may be employed in jobs that do not offer job security or, for that matter, any benefits at all. A third and most troubling factor noted by this author is the absence of more recent data within the literature since 2011. The Great Recession financially decimated millions of people across the country and, not incidentally, caused many people to not only lose their jobs but also resort to accepting work that made them underemployed. In addition, employers scaled back on replacing the well-paying jobs that were lost and created a larger temporary workforce, one which is

entitled to no benefits whatsoever (Skiba and O'Halloran, 2013; O'Halloran and Skiba, 2014). It will be helpful to see what emerges from more data collected in the last several years to determine its impact on parental leave.

From an employer's perspective, one would think that modest financial contributions to parental leave would be more than offset by increased productivity gains and lowered expenses. While speaking about the need for both paid parental leave and the federal government's need to recruit and retain what he described as "top people," House Minority Whip Steny Hoyer said, "We are at risk of not being able to recruit the top talent that America needs, that Americans need and that our federal government needs to do the complex and challenging jobs of making sure the American people are served well" (Katz, E., 2015, p. 1). In addition to saving recruitment and selection costs, the federal government and private industry also would benefit from paid parental leave by avoiding other costs associated with turnover, such as the training and development of replacement workers.

One company that has reaped the benefits of paid parental leave for its workers and itself is Google. As one writer commented, "when they [Google] decided to extend their maternity leave for new mothers to five months and made it paid, what do you think happened? That's right, more women started coming back after maternity leave. That means they saved money by not having to find and train new talented workers to replace the women who decided not to come back after maternity leave. And replacing smart, dedicated and trained personnel is not cheap and it's not easy" (Skyrm, 2015, p. 1).

HEALTHCARE ISSUES

Maternity leave from a job after childbirth provides critical time for maternal-infant bonding and adjustment to life with a new baby. A longer maternity leave has been linked with increased breastfeeding duration as well as improved maternal mental health and child development (Staehlin, 2007; Berger and Hill, 2005).

In an extensive examination of paid parental leave in the U.S., a group of researchers prepared a paper that was sponsored by the Institute for Women's Policy Research as a part of a series of Scholars' Papers sponsored by the U.S. Department of Labor Women's Bureau. Their research mirrored the importance of access to maternity leave related to breastfeeding rates and duration as well as the reduction in the risk of infant mortality, and the increased likelihood of infants receiving well-baby care and vaccinations (Gault, Hartmann, Hegewisch, Milli and Reichlin, 2014). Some of the healthcare dimensions from this study and elsewhere are elucidated below.

Breastfeeding Rates & Duration

Breastfeeding can increase bonding between the child and nursing mother, stimulate positive neurological and psycho-social development, and strengthen a child's immune system (U.S. Department of Health and Human Services, 2000). It has also been shown to reduce the risk of health problems such as diarrheal disease, respiratory illnesses, asthma, acute ear infection, obesity, Type 2 diabetes, leukemia, and sudden infant death syndrome (Ip et al. 2007; U.S. Department of Health and Human Services, 2011).

Both the American Academy of Pediatrics (2012) and the World Health Organization (2013) recommend exclusive breastfeeding for up to six months of age with continuation in conjunction with complementary foods for at least 12 months, if not longer.

As referred to earlier in this paper, Appelbaum and Milkman's (2011) study of California's Paid Family Leave program found that mothers who took advantage of this state's paid leave program breastfed for twice as long as those who did not take leave. Another study by Baker and Milligan (2008) used data from the National Longitudinal Study of Children and Youth to measure the effects of Canada's policy change in 2000, which increased job-protected, paid maternity leave from approximately six to 12 months. The authors found that women who took paid maternity leave after the reform breastfed longer and were more likely to breastfeed exclusively for the recommended 6 months.

Increases in Well-Baby Care & Vaccination Rates

Children whose mothers take time from work after childbirth are more likely to receive well-baby exams in the first years of life, which suggests that leaves taken for 12 weeks or longer could be instrumental in promoting

child health (Berger, Hill, and Waldfogel 2005). In addition, a longer maternity leave can give parents the time they need to make sure their children are properly immunized. Berger, Hill and Waldfogel (2005) found that when mothers stay home with an infant for at least 12 weeks after giving birth, their children have a greater likelihood of receiving their recommended vaccinations.

In one study, Daku, Raub, and Heymann (2012) compared the state of maternity leave in 185 countries to vaccination schedules to assess the impact of differential paid maternity leave policies on vaccination rates. Findings indicated that, after controlling for per capita GDP, healthcare expenditures, and societal factors, each 10 percent increase in the duration of full-time equivalent paid leave resulted in increased rates of vaccinations. For example, children are 25.3 percent and 22.2 percent more likely to get their measles and polio vaccines, respectively, when mothers have access to full-time equivalent paid maternity leave; without full-time equivalent pay, however, the duration of paid maternity leave was found to have no significant association with early immunizations and a relatively negligible association with those administered months after birth.

Effects of Family Leave on Maternal Psychological Health

It stands to reason that a mother's emotional well-being and mental health are integral to the quality of care she is able to provide to her infant. An appropriate duration of maternity leave can help prevent postpartum depression and stress. In one study in which 3,350 adults responded to the nationally representative Early Childhood Longitudinal Study – Birth Cohort, data indicated that women who took maternity leave longer than 12 weeks reported fewer depressive symptoms, a reduction in severe depression, and, when the leave was paid, an improvement in overall and mental health (Chatterji and Markowitz 2012). In an earlier study conducted by these researchers and another colleague, data from the National Institute of Child Health and Human Development Study on Early Child Care compared mothers who waited at least 12 weeks before going back to work after childbirth with mothers who returned after less than 12 weeks. The latter group exhibited greater levels of depressive symptoms, stress and self-reported poor health (Chatterji, Markowitz and Brooks-Gunn, 2011).

Another study designed to track psychological health followed a sample of 817 Minnesota employed mothers during the first year after childbirth. Data showed that the longer the duration of leave from work that a woman takes after giving birth -- up to six months -- the lower are her postpartum depression scores on the Edinburgh Postnatal Depression Scale (Dagher, McGovern, and Dowd, 2013).

Reduced Maternal Risk of Disease through Higher Breastfeeding Rates

In addition to the benefits of increased breastfeeding initiation and duration for infants, a longer maternity leave also may have multiple health benefits for their mothers. Although no direct links have been demonstrated, several studies have suggested an association between the duration of breastfeeding and a reduction in a woman's risk for breast cancer – especially among those with a genetic history of the disease – as well as ovarian cancer (Beral et al., 2002; Ip et al., 2007; Stuebe et al., 2009) and rheumatoid arthritis (Karlson et al., 2004). Furthermore, a large, prospective, longitudinal study using data from two cohorts of the Nurses' Health Study, Stuebe et al. (2005) found that breastfeeding for a longer duration may lower the risk of Type 2 diabetes in young and middle-aged mothers.

An excellent update and summary of these and other healthcare rationales for adequate and paid parental leave may be found in a recent white paper written by the Minnesota Department of Health's Center for Health Equity. A portion of this paper's Executive Summary is as follows:

> "The benefits of paid leave policies do not accrue only to individuals or families. Employers, communities, and systems all benefit from people being able to take care of each other and also fulfill their job responsibilities. When paid leave policies are present, people are healthier, they use less sick time, they need less health care, and their children do better in school. Mothers who take paid leave experience improvements in mental and physical health, receive better prenatal and postnatal care, breastfeed their babies for longer periods of time, and experience greater bonding with their children. Elders who are cared for by family members often have a higher quality of life. Workers who have access to paid leave are more likely to schedule and attend preventive care visits with providers, and those who take paid leave while sick

experience faster recovery and prevent the spread of illness and disease in the workplace" (Minnesota Department of Health, Center for Health Equity, 2015, p. 6).

AN OVERLOOKED POPULATION: FATHERS

Until recently, very few studies in the literature have examined how men use or do not use parental leave, and whether it is paid or unpaid. Within certain management disciplines, parental leave as applied to fathers appears to be addressed as a small subset of the "work-life balance" literature.

For example, over the course of five years, Groysberg and Abrahams oversaw data collected by Harvard Business School students who interviewed almost 4,000 executives worldwide and surveyed 82 executives in a Harvard Business School leadership course. Among a plethora of findings, student interviewers noted that, almost universally, "the leaders [we] spoke with dispensed valuable advice about how to maintain both a career and a family" and, as one of them reported, "All [respondents] acknowledged making sacrifices and concessions at times but emphasized the important role that supportive spouses and families played." Nevertheless, the authors acknowledged that "many students [interviewers] are alarmed at how much leaders sacrifice at home and how little headway the business world has made in adapting to families' needs" (Groysberg and Abrahams, 2014, online edition).

Another study of professional working women – and one which this author questions - was conducted by Bain & Company, whose researchers surveyed a wide spectrum of ages and career levels. The study found that "nearly half of all new women employees aspire to top management [but] within five years, only 16 percent still hold that ambition; this compared with 34 percent of men who begin their careers confident they will reach the top and remain so after two or more years of experience" (Bain & Company, 2014, p. 1). To this author, this summary implied that forces, including parental leave, may have affected this conclusion. However, this author was discouraged with the study's major findings: "…there are three areas where mid-career women encounter negative experiences and perceptions that put them off the fast track. First is a disconnect[ion] with the so-called worker stereotype – the "always on" fast-tracking go-getter. Second is [the] lack of supervisor support for mid-level women. The third – borne out of other shortcomings – is a lack of women role models at top company levels" (Ibid, 2014, p. 1). Admittedly, this author did not read the entire study but it appears to her that the first two of these "major findings" do not fully explicate the *reasons* behind disconnection and supervisor support, and these reasons may include the management and healthcare issues regarding parental leave – and affecting both women and men – that have heretofore been reviewed in this paper and elsewhere.

As bluntly stated by Matt Palmquist, a business journalist, "…ample evidence suggests that traditional definitions of gender roles persist, and businesses, for the most part, still expect their employees to remain fully focused on their professional duties despite their parental obligations. However, compared with the abundance of research on the challenges facing working mothers, relatively little attention has been paid to how professional fathers juggle their twin roles as employee and dad – and whether their companies help or hinder their efforts to achieve the right mix" (Palmquist, 2015, p. 68).

RECENT DEVELOPMENTS

In December of 2013, Representative Rosa DeLauro (D-Conn.) and Senator Kirsten Gillibrand (D-N.Y.) introduced a bill, the Family Act, modeled on the California family leave policies that are the most generous in the country. Their bill would guarantee 66 percent of pay to employees for up to 12 weeks of family leave – an improvement, but still not enough, according to one source (Kolhatkar, 2014). While the bill would finance itself through a 0.2 percent payroll tax, it has been stalled in Congress for well over a year. As one writer quipped, "Even if it passes, it [the Family Act] won't fix a system that paints a huge segment of the workforce into a corner. In a country where the median household income is $53,000, 66 percent of a salary might not be enough to support a family. But the Family Act would drastically change the lives of many Americans" (Suddath, 2015, p. 55).

To extend the availability of paid leave to federal workers and in late January of 2015, Representative Carolyn Maloney (D-N.Y.) introduced the Federal Employee Paid Parental Leave Act which would give these male and female workers six week of paid parental leave. It is important to note that earlier in that month, President

Obama signed an executive order allowing federal workers access to this benefit; he also called for separate Congressional legislation, and Maloney's bill would build upon his unilateral action (Katz, 2015). While some praised the Act, others believe it is useless to those who cannot afford to miss paychecks. Regardless, J. David Cox, the national President of the American Federation of Government Employees, believes that "this proposal helps narrow a gaping hole in the benefits offered to federal employees" (Ibid, 2015, p. 1). Cox added that the federal government already reimburses many of its contract employees for parental leave.

Soon, this next national election year will determine how well these and other or newer bills will be handled. Given the last several years of governmental in-fighting and intransigence, many legislators hope that partisan politics will not impede the growing need for paid parental leave.

CONCLUSION

Primarily, this paper has concentrated on our government's responses and public policy sectors' responses to the issues surrounding parental leave in general and paid parental leave in particular. Unfortunately and even though several analysts have argued the benefits of some form of paid parental leave for private sector employees, only in the last few years have predominantly large employers agreed to offer this benefit. One might think that, in particular, the technology sector of the business landscape, a sector that is viewed as progressive and generous with its employees, would embrace the concept. On the contrary, only recently did Netflix and Microsoft announce expanded parental leave policies that allow employees up to a year off (Lorenzetti, 2015). While many large technology companies have joined these ranks, the smaller ones have not. In fact, in a study conducted by an advertising start-up, PaperG, of the 97 tech companies ranging from seed stage to post-IPO that were polled, one-quarter offered less than a month of paid leave for new mothers (Ibid., 2015). One might argue that these smaller and younger companies do not have a human resources infrastructure in place to administer the benefit, or the impetus to offer the benefit simply because it has not become an issue. Nonetheless, this industry is a highly competitive one and smaller companies that do not offer an array of generous benefits may not be perceived by talented professionals as "employers of choice."

In an interview with Dr. Lotte Bailyn, a pioneering social psychologist and Professor Emerita at MIT's Sloan School of Management, she expressed bemusement with the term "work-life balance" because it does not express how people want to live their lives. Instead of separating or compartmentalizing "work" and "life," employers should view their employees as members of a much larger community that extends beyond a business and helps people live integrated lives (Geller, 2015). Part of this integration includes parental leave that offers the flexibility and financial stability issues discussed in this paper.

Finally, most of this paper reviewed some of the reasons why a lack of paid parental leave can cause serious problems for women and men who are employed in full-time positions that are, for the most part, stable positions. What is missing from this review is an examination of the problems faced by men and especially women who, for whatever reasons, are not working and ineligible to receive parental leave, much less paid parental leave. Inarguably and as briefly referenced at the beginning of this paper, "child poverty rates in the United States have consistently been much higher than child poverty rates in other developed countries" (Pressman and Scott, III, 2014, p. 69). Regardless of the country's status on the global stage, the United States should view the lack of adequate parental leave as a threat to future generations and a serious public health issue.

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DIABETES COMPLICATION PREVENTION AMONG INDIVIDUALS WITH COGNITIVE LIMITATIONS

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ABSTRACT

Background: *Diabetes is a debilitating chronic disease that, if not properly managed, can result in various health complications. Individuals must efficiently self-manage the disease in order to mitigate diabetes complications.*

Objectives: *To examine disparities in health behavior that prevent diabetes complications among individuals with diabetes who have a cognitive limitation and individuals with diabetes who do not have a cognitive limitation.*

Methods: *This study will use pooled cross-sectional data for years 2008-2013 from the Medical Expenditure Panel Survey Household Component (MEPS HC). The MEPS data were assigned weights to adjust for nonresponse and provide an estimate of the overall US population. The sample will consist of two groups: (1) individuals who were diagnosed with diabetes and who have cognitive limitations (n=1,875; 12%), and (2) individuals who were diagnosed with diabetes but who do not have cognitive limitations (n=12,897; 85%). Other individuals were excluded due to refusal, don't know, and inapplicable (n=439; 3%). Proposed dependent variables include never had a dilated eye exam, never had feet checked, had blood cholesterol checked, learned care from a source (such as from reading internet). The proposed independent variable includes whether an individual with diabetes has cognitive limitations. The covariates for the model include demographics, socioeconomic status, and geographic location. Multiple weighted logistic regressions will be used to assess the associations between the independent and dependent variables using STATA 14.*

Expected Results: *Our proposed study expects that individuals diagnosed with diabetes who have a cognitive limitation are less likely to engage in health behavior that will mitigate diabetes complications compared with individuals diagnosed with diabetes who do not have a cognitive limitation.*

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A MODEL FOR STRATEGICALLY MAPPING EARLY CAREER DEVELOPMENT

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ABSTRACT

Launching an early career effort requires careful thought and action plans. Students need to use outcome data and designed academic exercises to build a career strategy. Graduate Health Administration Programs can help students
acquire specific knowledge, skills and values as part of the graduate education experience. This presentation examines program requirements that can be designed and utilized by MHA students. In addition to program requirements, faculty can design specific activities into courses and the curriculum that further enable students to crystalize a career roadmap. This presentation combines community engagement and study abroad as a way of developing specific competencies that students can use to differentiate themselves. A focus is placed on Jesuit education and pedagogy as a way of providing a model that utilizes reflection, discernment and action plans. Specific outcomes are detailed that can be used in meeting CAHME outcomes metrics and criteria.

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OCCUPATIONAL INJURY PATTERNS, AND PERCEIVED TRAINING AMONG HOME-BASED DIRECT CARE WORKERS IN U.S. HOME, AND HOSPICE CARE AGENCIES

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ABSTRACT

The main objectives of the study were to profile occupational injury patterns across home health, and hospice care organization characteristics, home-based direct care workers (DCWs) individual characteristics, and examine how worker training affect home health aides (HHAs) risk for reporting an occupational injury. Training knowledge was measured by an 11-item addressing HHAs knowledge on training topic areas. Univariate, and bivariate analysis was conducted. Work-related injury, and type of injury were found to be associated with the increased risk for reporting an injury along with full time employment, high hourly pay rate, and working in an in-patient or mixed setting.

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THE INFLUENCE OF CULTURAL COMPETENCE IN HEALTHCARE

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ABSTRACT

The integration of cultural competence and diversity in healthcare organizations is imperative as both the multicultural workforce and the patient population continues to escalate. This is a daunting challenge as the demographics of the United States are also changing. The small community hospital is no longer immune from dealing with cultural diversity in the workforce as they are forced to hire nurses from overseas due to the nursing shortages.

The increase of United States cities that now have a designation of minority-majorities present critical challenges to the clinical team assessing and delivering care. The need to work across cultures to gain perspective, collaborate and develop policies requires a commitment from the leaders of the organization. This paper will discuss organizations that have conducted cultural competence organizational assessments and made progress in implementing organizational changes.

In addition, gaps in the research will be discussed focusing on leaders and stakeholders dealing with globalization and the ever changing environment of the healthcare arena.

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SUSTAINED SOBRIETY IN ADDICTION RECOVERY SYSTEM: IMPACT ON HEALTH DELIVERY

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ABSTRACT

The goal of the addiction recovery system is to support individuals in sustaining sobriety. However, statistics show that relapse within addiction is a common problem. The paper reviews the parts of the recovery system, its behaviors, and provides insight on potential factors that may improve the system for better sobriety rates. The author suggests possible solutions to the problem and factors that may lead individuals to long-term sobriety.

Key Words: Sobriety, Recovery, Recovery System, Systems Behavior, Addiction

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THE ROLE OF HEALTHCARE ADMINISTRATORS IN OVERCOMING THE BARRIERS PREVENTING NURSE PRACTITIONERS FROM PRACTICING IN PRIMARY CARE

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ABSTRACT

Primary care services are the driving force behind the majority of preventative care and screening programs and the first point of contact for new health care issues. They are essential to the maintenance of individual and population health and well-being and controlling costs within the complex, dynamic healthcare system within the U.S. However, the health care system in the U.S. is struggling with an increasing demand for and decreasing supply of primary care providers which is causing a severe lack of primary care services. Based on the results of a descriptive study conducted to explore the barriers that prevent nurse practitioners from working in primary care, this presentation examines the role healthcare administrators assume in overcoming the barriers that prevent nurse practitioners from having a positive impact on an already strained primary care system.

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THE CONTRIBUTION OF THE LAY THEORIES APPROACH TO THE STUDY OF HEALTH MAINTENANCE DECISIONS: A RESEARCH AGENDA

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ABSTRACT

The theories people use in their everyday life have been termed lay theories, because people are not necessarily aware of their theories or the impact of those theories on their social understanding. The study of the impact of people's lay theories on their social understanding has a long history in personality and social psychology (Hong, Levy and Chiu, 2001). Like scientific theories, lay theories serve the epistemic function of sense making. Lickel, Hamilton, and Sherman (2001) maintain that people use lay theories to understand events and to make inferences about social reality. Similarly, Levy, Plaks, Hong, Chiu, and Dweck (2001) submit that a lay theory provides meaning systems "that impose psychologically meaningful constraints on the infinite variety of interpretations available for a particular stimulus or event" (p. 156).

As opposed to scientific theories, lay persons develop their own theories that are frequently implicit and deal with human characteristics such as ability, personality and intelligence (Burnette, O'Boyle, VanEpps, Pollack, & Finkel, 2013). The core assumption of implicit self-theories is that personal beliefs are critical for understanding human behavior. Such a lens that individuals use to see and understand the world around them involves schematic knowledge structure that explains beliefs and ascribes meanings to people and events (Ross, 1989). Such schematic knowledge structure constitutes implicit theory.

The core proposition of the implicit self-theories is that some people possess malleability of personal qualities while others do not. Such lay belief in systemically different implicit theories about the surrounding world led to the origin of this lay theory in the field of social psychology. According to this body of research, there are two distinct types of implicit self-theories: entity theorists and incremental theorists. While implicit lay theories have been used in the contexts of education and consumer research, its use in healthcare research remains unknown. The objective of this paper is to investigate how implicit self-theorists respond differently to health maintenance challenges with regard to differentiated decision choices, such as compliance and adherence with health regimens, choice of OTC versus prescription drugs, and visits to health care providers.

Entity theorists are characterized by their belief in the fixed nature of human attributes such as ability which cannot be further developed through their own efforts. When provided with an opportunity to learn or acquire new skills, entity theorists evince helpless and defensive reaction (Martocchio, 1994; Rhodewalt, 1994; Robins & Pals, 2002). They set goals with focus on performance. When faced with challenges in their pursuit of goals, entity theorists frequently employ helpless-oriented strategy and feel anxious and vulnerable while evaluating past and future performance (Burnette et al., 2013).

In contrast, incremental theorists are characterized by their belief that human attributes are malleable, not fixed. When presented with opportunities to learn and develop skills, incremental theorists demonstrate confidence in their abilities. They believe that they can improve their abilities through their efforts and therefore look forward to opportunities to learn and develop their skills (Dweck, 2000; Martocchio, 1994; Robins & Pals, 2002; Wood and Bandura, 1989). They set learning goals with focus on improvement and development of attributes. Incremental theorists work hard toward achieving their learning goals, employ mastery-oriented strategy to achieve these goals,

and possess high level of confidence in their achievement potential (Burnette et al., 2013). Their learning goals are set with the objective of developing mastery with the core belief that learning has value. Hence, failure is understood as a lack of effort rather than being incompetent and that it can be improved through perseverance. In contrast to entity theorists, incremental theorists are less likely to set performance goal while being more likely to set learning goals (Mangels, Butterfield, Lamb, Good, & Dweck, 2006; Robins & Pals, 2002).

There has been emergence of a recent body of literature in psychology and marketing, that uses implicit theories to explain how consumers can face challenging situations in their lives. For example, Park and John (2014) observed that brand use can enhance consumer self-efficacy within entity theorists, leading to better task performance. Park and John (2014) observed the brand use as a "crutch" to improve task performance through self-efficacy for entity theorists. However, how performance in a healthcare challenge would alter the health beliefs in entity and incremental theorists and how differentiated health maintenance decisions could reflect a response to their self-esteem concerns remain an enigma. By addressing this issue, the current research considers health maintenance challenges with regard to differentiated decision choices, such as compliance and adherence with health regimens, choice of OTC versus prescription drugs, and visits to health care providers as responses following a challenging health situation. There are several research questions that the current paper seeks to address. How do implicit self-theorists (entity and incremental theorists) handle chronic health failure, failure with feedback, and success? How would these task outcomes influence their health beliefs? What kind of health maintenance choices would help the entity theorists to maintain and repair their health beliefs? How would this response differ for incremental theorists?

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EXPLORING THE IMPACT OF AN INTERPROFESSIONAL CARE PROTOCOL ON THE PATIENT EXPERIENCE AND OUTCOMES FOR SENIORS WITH DIABETES AND ITS ECONOMIC IMPACT

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ABSTRACT

With more than one in five Americans age sixty-five and older living with diabetes, innovation in approaches to managing the care of these individuals is a public health imperative. There is a growing consensus that interprofessional (IP) team-base care will lead to improved health outcomes. This study explores the impact of a care protocol for seniors with diabetes that was developed by an interprofessional team of care professionals. Seniors with diabetes who volunteered to participate received services delivered by either a nurse or physician assistant at monthly visits over a six month time frame. Services were provided on a mobile care unit at senior centers or at an outpatient clinic. Data collection included monthly vital signs, assessment of medication compliance, weight, BMI, and foot exams. Pre and post -test measures included self- reported responses to a Diabetes Quality of Life Questionnaire (DQOL). The results of this study can serve as a framework to advance the work in creating workforce training and care model processes that will serve as the impetus for organizational change to ensure that interprofessionalism, and the anticipated benefits in patient outcomes and delivery efficiencies are sustainable in the future. The study further demonstrated that interprofessional approach to diabetes helps save cost and improves patients' outcomes.

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OCCUPATIONAL RANKING, BODY MASS INDEX, AND GENDER DISCREPANCIES

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ABSTRACT

Studies indicate that looks (beauty) and weight matter when getting hired, especially for women. This study focuses on whether there is a correlation between being obese or overweight and market outcomes as measured by occupational prestige using the Nam-Powers-Boyd occupational ranking, when controlling for education. Utilizing data from the American Time Use Survey, this study will analyze (1) whether occupational rankings are associated with body mass index (BMI) level, ceteris paribus, and (2) whether gender discrepancies exist. Research indicates that there is substantial weight discrimination in the United States (Puhl, Andreyeva, & Brownell, 2008). Therefore, besides the well-documented direct costs of obesity, additional indirect costs may be present such as occupational discrepancies that may arise due to discrimination in the workplace. In order to test this proposition, occupations were ranked based on occupational socioeconomic scores; these scores reflect both the average education and income of the occupation, and therefore represent a level of living for the typical person in specific job classifications (Nam & Boyd, 2004). The literature suggests that discrimination stems from potential employers excluding women from particular jobs based on their appearance or weight, rather than qualification. Though the level of qualification cannot be controlled for in this study, given the data, the goal of this study is to further analyze whether there is an association between BMI and occupational ranking by gender.

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TESTOSTERONE REPLACEMENT TREATMENT: FOUNTAIN OF YOUTH OR LA BREA TAR PIT?

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TESTOSTERONE REPLACEMENT TREATMENT: FOUNTAIN OF YOUTH OR LA BREA TAR PIT?

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ABSTRACT

Testosterone is a naturally occurring hormone required for male health. In recent years, pharmaceutical companies have widely promoted its use to alleviate effects of aging ("low T"). Several recent clinical studies have noted a possible relationship between testosterone replacement therapy and cardiovascular complications. These studies, and others noting benefits associated with testosterone treatment, are reviewed.

INTRODUCTION

Testosterone is a naturally occurring hormone found in humans and other vertebrates. It is secreted by the testicles of males and is the principal male sex hormone, playing a key role in the development of male reproductive tissues such as the testis and prostate as well as promoting secondary sexual characteristics such as increased muscle, bone mass, and the growth of body hair (Mooradian, Morley and Korenman, 1987). Although not essential for life, it is required for health and well-being (Bassil, Alkaade and Morley, 2009) as well as the prevention of osteoporosis in males (Francis, 1999; Tuck and Francis, 2009).

Testosterone replacement treatment (TRT) has been approved by the U.S. Food and Drug Administration (FDA) for adult males who suffer from medical conditions associated with a deficiency or absence of endogenous testosterone (primary or secondary hypogonadism). Testosterone levels normally peak in a man's 20s, then fall naturally by 1% to 2% per year (Feldman et al., 2002; Yeap et al., 2009). Time magazine quotes an unnamed FDA spokesperson as stating "There are no testosterone drugs approved as a treatment for low testosterone levels, often referred to as 'low T,' without an associated medical condition" (Von Drehle, 2014, p. 48).

Notwithstanding the FDA's position, pharmaceutical companies have attempted to label aging men's declining testosterone levels as pathological - to convince men that certain effects of aging, like slowing down and feeling less sexual, constitutes a new disease, and that taking a either a prescription or OTC drug is the cure (LaPuma, 2014). Thousands of doctors around the world are prescribing testosterone off-label for men with borderline low or even low-normal T levels (Davis, 2003), a practice which is completely legal and ethical, but can involve some risks, especially risks related to possible malpractice suits (Buppert, 2012). Handelsman (2013) noted that the number of testosterone prescriptions grew by nearly 1000% between 2000 to 2011, part of a worldwide boom, and Canadian online pharmacies filled millions of such prescriptions, many of them for Americans. In 2013, sales of prescription testosterone in the U.S. were $2.4 billion (Von Drehle, 2014), and are estimated to rise to $5 billion by 2018 (Jaret, 2014). The FDA estimated that 2.3 million prescriptions for testosterone were filled in the U.S. in 2013 (Tucker, 2014). These increases in numbers of testosterone prescriptions occurred "without changes in proven medical indications or improvements in diagnosis of pathologically based androgen deficiency" (Handelsman, 2013, p. 548). In 2011, there were 5.3 million prescriptions written for testosterone in the U.S., at a retail market value of $1.6 billion (US Securities and Exchange Commission, 2012; Spitzer et al., 2013). Sales of topical testosterone drugs increased 10% in 2013, to $2.2 billion, according to data from market-research firm IMS Health (Weintraub, 2015). These numbers most probably underestimate the market size, both in numbers of prescriptions written and dollars spent, as much testosterone is dispensed at low T clinics, where it isn't tracked

since it's often bought with cash (Varney, 2014) and many men are using OTC testosterone gels and supplements, a practice which is not FDA regulated.

Several studies have found that men were more prone to cardiovascular complications while taking testosterone. The results of a survey of more than 55,000 patient records in the Public Library of Science concluded that "in older men, and in younger men with pre-existing diagnosed heart disease, the risk of MI following initiation of TT prescription is substantially increased" (Finkle, 2014). A 2010 study of testosterone therapy for frail and elderly men was discontinued early when the risk of adverse cardiovascular events was deemed too high (Basaria et al., 2010). These results were consistent with those of Vigen et al. (2013), who examined a cohort of 8,000 men in the VA health care system who underwent coronary angiography and had a low serum testosterone level, concluding that the use of testosterone therapy was associated with increased risk of adverse outcomes. It should be noted, however, that as of July 21, 2015, over two dozen medical societies and more than 160 testosterone researchers from around the world have called for retraction of the Vigen et al. (2014) study (see Table 1), citing "gross data mismanagement and contamination" that rendered the study "no longer credible" (Androgen Study Group, 2014; Morgentaler et al., 2015).

--- insert Table 1 here ---

Later in 2014, the FDA called on testosterone manufacturers to warn patients about possible risks of blood clots in veins, a finding not related directly to the heart-attack and stroke concerns. The FDA scheduled a meeting of experts in September to sort out the available evidence in the disputed science of TRT. This panel voted 20-1 to require re-labeling of testosterone-replacement products, with the aim of decreasing their widespread use for "age-related" hypogonadism and requiring the inclusion of information about a possible increased risk of heart attacks and strokes in patients taking testosterone (McCullough, 2015). The FDA further re-iterated that health care professionals should prescribe testosterone only for men with low testosterone which has been confirmed by laboratory tests (FDA, 2015). The panel called for additional studies to demonstrate both clinical benefit and safety of the products (Tucker, 2014).

Let's take these revised FDA requirements in order. Labeling of prescription testosterone products has been revised to reflect FDA-approved clinical indications (see, for example, the website for AndroGel, https://www.androgel.com about-androgel-1-62-percent?cid=ppc_ppd_yah_andro_br_2015_androgel_Exact__8521790807). Requiring laboratory testing is more problematic, as the necessity for testing is a matter of clinical judgement of individual physicians. Prior to the new FDA requirement, only about half of men taking TRT had been actually diagnosed with low testosterone. In fact, there was no evidence that 25% of users ever had their testosterone blood concentrations tested prior to initiating therapy, and 21% of those prescribed TRT never had their blood levels tested while they were taking TRT (Tucker, 2014). There is little agreement about even the most basic questions regarding blood testing for testosterone (Von Drehle, 2014):

- What is the most appropriate approach to the measurement of testosterone?
- What level of blood testosterone is "low? Different laboratories use wildly varying reference numbers, anywhere from 300 to 900 nanograms per deciliter (Jaret, 2014).
- Is "low T" itself a condition (the so-called "male andropause") or merely a symptom? As Paul (2015) noted, it's unclear whether low T represents a true epidemic for America or if the situation is simply a problem which has become "medicalized" (Conrad, 2008), resulting in an abundance of prescriptions and treatments (Longman, 2010; Welch, Schwartz and Woloshin, 2007).

CLINICAL STUDIES

There appears to be a significant difference of opinion regarding the use of TRT (Brooks, 2015). The FDA has obviously realized that testosterone is being used extensively in an attempt to relieve symptoms in men who have low testosterone due solely to aging, and has concerns regarding the benefits and safety of the drug for this use. The FDA has apparently decided to come down on the side of caution, believing that that there is a possible increased cardiovascular risk associated with testosterone use because some studies reported an increased risk of heart attack, stroke, or death associated with testosterone treatment, while others did not. Europe feels otherwise. In November of 2014, the Coordination Group for Mutual Recognition and Decentralised Procedures–Human, a

regulatory body representing European Union member states, reported that there was "no consistent evidence" of an increased risk for cardiovascular problems associated with the use of testosterone products.

The FDA reviewed five retrospective cohort observational studies (Vigen et al., 2013; Finkle et al., 2014; Shores et al., 2012; Muraleedharan et al., 2013; Baillargeon et al., 2014) and two meta-analyses of placebo-controlled trials (Xu et al. 2013; Corona et al., 2014) which examined the risk of cardiovascular events associated with TRT. Conflicting results were found among with the five observational studies: statistically significant cardiovascular problems associated with TRT were identified in two of these studies (Vigen et al., 2013; Finkle et al., 2014), a statistically significant mortality benefit associated with TRT was identified in two other studies (Shores et al., 2012; Muraleedharan et al., 2013 per abstract), and the fifth study (Baillargeon et al., 2014) found no effect overall, but did find a modestly protective effect for men with higher MI risk.

The five observational studies and the Xu et al. (2013) meta-analysis were later reviewed at a joint meeting of the Bone, Reproductive and Urologic Drugs Advisory Committee and the Drug Safety and Risk Management Advisory Committee on September 17, 2014. This group generally agreed the risk of cardiovascular complications associated with TRT appeared relatively low, and recommended a prospective, well-controlled clinical trial to clarify the true magnitude of the relationship. The Corona et al. (2014) meta-analysis, which involved 26 published, randomized, controlled trials, 20 of which were also included in the Xu meta-analysis, found no statistically significant increased risk of cardiovascular events associated with TRT, but could not be reviewed in time to be presented at the Advisory Committee meeting.

Calls for large, long-term, placebo-controlled randomized clinical trials to examine the relationship between TRT and cardiovascular risks have been made for some time (e.g., Bain et al., 2007; Buvat, 2006; Tucker, 2014; Finkle et al., 2014; Hackett, Kirby and Sinclair, 2014). Interestingly, there have been a myriad of studies which have demonstrated benefits of TRT in hypogonadal men, including improved sexual desire and/or function, improved energy, mood, and vitality, improved quality of life, and improved obesity parameters (as measured by increased lean muscle mass and/or strength, reduced waste circumference, reduced total body fat, reduced body weight and/or mass, reduced BMI, and increased bone mineral density (see Table 2).

--- insert Table 2 here ---

Despite the alarm about the potential negative cardiovascular side-effects of TRT, there appears to be a strong positive relationship between normal testosterone and health that, that, while noted in the past, has been overshadowed by more recent studies.

On the other hand, is it possible that at least some of the benefits noted in Table 2 could be due to a placebo effect? Seidman and Roose (2006) have studied sexual dysfunction in depressed older men extensively. They devised an experiment to test whether injectable testosterone compared to a placebo at improving moods and erections. In a randomized, double-blind test, they gave testosterone injections to some subjects and harmless sesame-oil injections to the others. All the test subjects had been experiencing depression and erectile dysfunction. Many of them reported improvements in their mood and function after treatment, but the doctors found no statistically significant difference between the patients injected with testosterone and those injected with the placebo.

CONCLUSIONS

The likelihood of adverse effects of long-term TRT is still essentially unknown, as overall high-quality evidence based upon prospective randomized clinical trials to recommend for or against its use in most men with (or without!) testosterone deficiency does not yet exist. Evidence to suggest that TRT increases cardiovascular … risk is spotty, as results vary across studies, yet the number of prescriptions written in the U.S. for testosterone have more than tripled in the last 10 years (Baillargeon et al., 2013). It appears that the widespread off-label exposure of men to testosterone could easily be classified as a "massive science experiment" with unknown risks for those participating.

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Table 1: Professional Societies supporting The Androgen Study Group's request to the Journal of the American Medical Association for retraction of Vigan et al. (2013), listed in alphabetical order (downloaded 10/10/15 from http://www.androgenstudygroup.org/co-signers/list-of-co-signers-medical-organizations)

American Society for Men's Health (ASMH)
Brazilian Society of Endocrinology and Metabolism
Canadian Male Sexual Health Council, an affiliate of the CUA
Canadian Society for the Study of the Aging Male (CSSAM))
European Society for the Study of the Aging Male (ESSAM)
European Society for Sexual Medicine (ESSM)
German Society for Men and Health
Indonesian Andrologist Association
International Society for Men's Health (ISMH)
International Society for Sexual Medicine (ISSM)
International Society for the Study of the Aging Male (ISSAM)
Irish Association of Sexual Medicine
Italian Society of Andrology
Italian Society of Andrology and Sexual Medicine
Japan ASEAN Council for Men's Health and Aging
Japanese Society for Men's Health
Korean Society for Sexual Medicine and Andrology
Malaysian Men's Health Initiative
Malaysian Society of Andrology and the Study of the Aging Male
Mens Health Initiative of British Columbia (Canada)
Mexican Association of Bone and Mineral Metabolism
Middle East Society for Sexual Medicine
Russian Society for Men's Health
South Asian Society for Sexual Medicine
Sexual Medicine Society of North America (SMSNA)
Sociedade Latinoamericana de Medicina Sexual (Latin American Society for Sexual Medicine)
The Society for Men's Health, Singapore)
Society for the Study of Androgen Deficiency
Society for the Study of Andrology and Sexology, Singapore (SSASS)

Table 2: Studies Demonstrating Positive Effects of Testosterone Therapy in Hypogonadal Men

Symptom(s)	Studies
Improved sexual desire and/or function	Abrams, 2001 Boloña et al., 2007* Corona et al., 2014* Hackett et al., 2013 Hackett et al., 2014-k Isidori et al., 2005 Pexman-Fieth et al., 2014 Rabkin, Gagner and Rabkin, 2000 Saad et al., 2013 Srinivas-Shankar et al., 2010 Wagner and Rabkin, 1998 Wang et al., 2000 Yassin et al., 2014
Improved energy, mood and/or vitality	Abrams, 2001 Hackett et al., 2013 Hackett et al., 2014 Pexman-Fieth et al., 2014 Rabkin, Gagner and Rabkin, 2000 Wagner and Rabkin, 1998
Improved QoL	Abrams, 2001 Grinspoon et al., 1998 Hackett et al., 2013 Hackett et al., 2014 Ho et al., 2012 Lu et al., 2006 Pexman-Fieth et al., 2014 Rabkin, Gagner and Rabkin, 2000 Srinivas-Shankar et al., 2010 Tong et al., 2012 Yassin et al., 2014
Improved obesity parameters Increased lean muscle mass/strength	 Abrams, 2001 Bhasin and Javanbakht, 1999 Emmelot-Vonk et al., 2008 Fairfield et al., 2001 Grinspoon et al., 2000 Hengge, 2003 Page et al., 2005 Rabkin, Gagner and Rabkin, 2000 Srinivas-Shankar et al., 2010 Wang et al., 2000
Reduced waist circumference	Aversa et al., 2014 Francomano, Lenzi and Aversa, 2014 Hackett et al., 2013 Hackett et al., 2014 Haider et al., 2014 Pexman-Fieth et al., 2014 Saad et al., 2013 Yassin et al., 2014
Reduced total body fat	Emmelot-Vonk et al., 2008 Page et al., 2005 Srinivas-Shankar et al., 2010 Svartberg et al., 2008

	Wang et al., 2000 Wang et al., 2004
Reduced body weight/mass	Francomano, Lenzi and Aversa, 2014 Hackett et al., 2014 Haider et al., 2014 Hengge, 2003 Saad et al., 2013 Wang et al., 2004 Yassin et al., 2014
Reduced BMI	Hackett et al., 2014 Saad et al., 2013 Pexman-Fieth et al., 2014 Yassin et al., 2014
Increased bone mineral density	Aversa et al., 2010 Svartberg et al., 2008 Wang et al., 2001 Wang et al., 2004

* meta analysis

TRACK
HEALTH COMMUNICATIONS

COMMUNICATING WITH OUR GENERAL PRACTICE PHYSICIANS

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ABSTRACT

Physician-patient communication associates with all areas of health care; such as treatment adherence, patient outcomes, and providing quality care. Individuals desire communication with their physician on every facet of care the patient receives and the communication must be a two way exchange between the patient and the physician. This study aims to assess the communication between the individual and their general practice physician (GP). Individuals (n=247) completed a survey assessing communication with their GP. Responses were analyzed using gender, age, length of time with the same physician, patient having health insurance, patient having to change to another general physician due to health insurance changes, and the number of annual visits the patient makes to the GP. Additional analysis with these factors assesses how the individual rates the overall relationship with their physician.

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INFATUATED—MEDIA AND TARGETED MARKETING CONTRIBUTIONS TO THE RISE OF OBESITY IN AMERICA

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ABSTRACT

More than one-third (34.9% or 78.6 million) of U.S. adults are obese.[1] Rates of obesity are higher among middle age adults 40-59 years old (39.5%) than among younger adults ages 20-39 (30.3%), or adults over 60 or above (35.4%) adults.[2] More alarming, the proportion of American children 6-11 years of age who are obese has increased from 7% in 1980 to 18% in 2012, and the proportion of adolescents 12-19 years of age who are obese has increased from 5% in 1980 to almost 21% in 2012.[3, 4] In 2012, more than one third of children and adolescents were overweight or obese".[1]

"Overweight and obesity substantially raise the risk of morbidity from hypertension, dyslipidemia, type 2 diabetes, coronary heart disease, stroke, gallbladder disease, osteoarthritis, sleep apnea and respiratory problems, and endometrial, breast, prostate, and colon cancers".[3] These rates and conditions resulted in an estimated annual medical cost of obesity in the U.S. was $147 billion in 2008. The medical costs for people who are obese were $1,429 higher than those of normal weight.[4]

These obesity trends among children, adolescents, and adults, along with the rise in related prevalence of associated chronic disease morbidity and mortality and their health care costs should suggest to all that countering overweight and obesity in America needs to be a top priority for the country. Where should we focus our attention? Clearly, we need to focus on children and youth, as their rates of overweight and obesity are escalating adult obesity, and will add to the already heavy economic burden of these conditions. Some researchers have provided evidence indicating that maternal obesity influences on children's obesity are greater than paternal obesity influences.[5] In both cases, role modeling as explained by both the Health Beliefs Model (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy) and social influencers on multiple levels depicted by the Social Ecological Model (the social influences of parents, peers, those in one's social organizations, and public policies and social influences like media) condition children's and adolescents' behaviors and habits.[6] Also, the issue of the strength of parent controls as compared to the child's control over their own behaviors has been researched as related to overweight and obesity.[7,8] Other studies have investigated the role that media plays in promoting and preventing obesity.[9,10]

This review of this literature led us to investigate the media outlets that are focused on children and adolescents, and to conduct observational research to begin understanding the balance between "obesity promoting ads" versus "obesity fighting ads". After identifying these outlets, the authors observed the media outlets and used structured data collection instruments to count the number of ads that promote obesity and the number of ads to combat obesity to pilot methods for estimating the impact of the media on America's children's eating and drinking behaviors associate with obesity. While the results are limited in scope (types of media, media outlets, and geographic markets; Atlanta region) and duration, they are none-the-less suggestive of additional research that needs to be conducted that can possibly lead to Federal, state, and local public health agency and medical association recommendations and regulations to govern "obesity promoting ads" similar to those that prohibit media advertisement of cigarettes and other tobacco products in the U.S.

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TRACK
HEALTH ECONOMICS

HEALTHCARE PAYMENT REFORM: WILL IT WORK?

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ABSTRACT

The Patient Protection and Affordable Care Act (PPACA) provides for payment reform incentives to encourage providers to increase efficiency, increase patient satisfaction, reduce medical errors, and improve patient health. This presentation examines the history of payment reform and the impact on key economic indicators prior to the enactment of the PPACA. The presentation then describes the payment reform provisions included in the PPACA, the potential impact on the current economic indicators, and whether the payment incentives will result in the stated goals of better health, better healthcare and lower cost.

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PERCEPTIONS OF THE UNINSURED ON THE AMERICAN HEALTHCARE SYSTEM

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ABSTRACT

The purpose of this empirical study was to examine perceptions of uninsured patients on the American healthcare system. We use the Center for Studying Health System Change's 2010 Health Tracking Household Survey to examine the impact of various factors on healthcare satisfaction of 1340 uninsured American respondents. Standardized regression coefficients indicate that factors like satisfaction with primary care physician, visits to in-store health clinics, those with children, older respondents, and race had a significant positive impact on satisfaction with healthcare of uninsured Americans. In addition, deferring medical treatment and number of emergency room visits had a negative impact on healthcare satisfaction of the uninsured. While the results of this study have serious implications for hospital administrators, they also have broader implications for all types of healthcare organizations that deal with the uninsured. In summary, this study increases the understanding of social science researchers and medical providers on how different factors impact satisfaction of the uninsured on the healthcare they receive in the United States.

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ANTITRUST CONSIDERATIONS IN HEALTH INSURANCE MERGERS

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ABSTRACT

The passage and implementation of the Patient Protection and Affordable Care Act has led to significant change in health insurance markets. Growing uncertainty regarding pricing pressures on enrollee premiums and costs of paying for care has led four of the nation's largest health insurers to announce mergers.

The resulting market consolidation will reduce competition in certain geographic markets and can be expected to change the negotiating dynamic for provider agreements. Hospitals, long-term care providers and physician practices should anticipate more difficult negotiations in markets where the number of competing plans has been reduced.

The announced mergers will be reviewed by government regulators from an antitrust perspective. While more traditional antitrust enforcement has focused on reduced competition among sellers in a marketplace, existing antitrust theory allows for enforcement when purchasers, such as health plans, consolidate and reduce competition in markets.

This presentation will examine antitrust theory applied to buyers and will offer perspectives on how regulators might intervene in the proposed transactions. Any antitrust enforcement actions taken prior to the date of the presentation will be analyzed as part of the presentation.

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ICD-10: ARE WE THERE YET OR IS BEING STUCK BY A DUCK OR INJURED WHEN YOUR SURF BOARD IS ON FIRE REALLY AN IMPROVEMENT OVER ICD-9?

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ABSTRACT

This paper will briefly examine selected aspects of the International Code of Diseases-10 CM/PCS (hereinafter referred to as simply ICD-10) as it applies to the healthcare system and providers in the United States. The ICD-10 has possibilities to improve aspects of healthcare. However, it also has significant issues that may add considerable expenses to already increasing healthcare costs in the U.S.

The International Disease Code (ICD-9), after a long, arduous, dilatory, and complicated journey is finally in the process of being replaced in the United States by the new and supposedly improved ICD-10. This code, among other things, is used for providing a common basis for classifying medical diagnoses, and causes of injuries, illnesses and other conditions subject to medical intervention.

The ICD-10 is used in many countries and has been translated into a number of languages. ICD-10 was proposed a number of years ago and signed into law for use in the United States by President George W. Bush. Congress intervened to delay the adoption and implementation of ICD-10 and the statute delaying the Code was signed into law by President Obama.

The new ICD-10 is enormously more detailed and complex than ICD-9. For example the number of coded "events" approaches 200,000. This has implications of huge costs in terms of time and money for training staff and medical professionals in using the latest edition of the International Disease Control. Medical personnel will have incalculable loss of productivity in terms of selecting the precise code used for billing purposes. Incorrectly coded claims will be denied adding to the cost of medical care in terms of lost revenue, recoding, re billing, perhaps re billing again, and whatever else can be imagined.

This topic will most certainly require additional examination and research as ICD-10 and subsequent revisions are implemented and other issues are discovered.

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QUALITY OF CARE AND PROFITABILITY IN NOT-FOR-PROFIT VERSUS FOR-PROFIT NURSING HOMES

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QUALITY OF CARE AND PROFITABILITY IN NOT-FOR-PROFIT VERSUS FOR-PROFIT NURSING HOMES

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ABSTRACT

Nursing home residents across the Unites States rely on quality care and effective services. Nursing homes provide skilled nurses and nursing aides who can provide services 24 hours a day for individuals that could not perform these tasks for themselves. Not-for-Profit (NFP) versus For-Profit (FP) nursing homes have been examined for utilization and efficacy, however, it has been shown that NFP nursing homes generally offer higher quality care and greater profit margins compared to FP nursing homes. The purpose of this research was to determine if NFP nursing homes provide enhanced quality care and a larger profit margin compared to FP nursing homes. Benefits and barriers in regards to financial stability and quality of care exist for both FP and NFP homes. Based on the findings of this review, it was suggested that NFP nursing homes have achieved higher quality of care due to a more effective balance of business aspects, as well as prioritizing resident well-being, and care quality over profit maximization in NFP homes.

INTRODUCTION

Nursing homes provide skilled nurses and nursing aides who can provide services 24 hours a day for individuals that could not perform these tasks for themselves (Robinson, 2014). The difference between for Not-for-Profit (NFP) and For-Profit (FP) nursing homes is that NFP facilities do not pay financial obligations such as federal income taxes and property taxes Grabowski and Stevenson (2008). On the other hand, FP nursing homes are owned by either private investors or shareholders and is therefore part of a company that sold stock to raise revenue to expand the facilities' activities (The Medicare Newsgroup, 2014).

Quality of care may be measured in a variety of ways. One of the most widely used approaches to quality measurement in healthcare is the conceptual framework of Avedis Donabedian (1966). This model of structure, process, and outcomes has impacted healthcare in multiple ways (CMA, 2011). Structural factors are easy to use and access, however, nursing homes can meet these measures but not necessarily provide quality care. For example, it is important to have high staffing numbers but the quality of the staff is more imperative in a nursing home. Process quality indicators reflect on the nursing homes and can be an advantage or disadvantage depending on ownership. In addition, if a vaccination is provided to the resident of the nursing home or not is a good example of process quality indicators. Different plans such as how medication is distributed to reduce errors or toilet plans to reduce bowel accidents with residents are placed into effect and may provide efficient and effective ways of process quality indicators. Process quality indicator plans increase quality of nursing homes while increasing effectiveness of staff. Outcome quality indicators in NFP and FP should reflect on structure, process and provide good health outcomes if appropriate care is provided. According to the authors, outcome quality indicator plans analyze quality of care; however, it is important to take in consideration external and genetic factors that can render outcome results (Castle and Ferguson, 2010). Therefore, the Donabedian model serves as a guideline for coordinating/delivery of care in an attempt to work hand in hand with the three related concepts (Kobayashi, Takemura and Kandra, 2011; Mor et al., 2009).

At the time of placement in a nursing home, residents are often unaware of factors such as ownership (NFP or FP) or the types of resources the facility may or may not have (Alliance for Advancing Nonprofit Health Care, 2011). For example, one nursing home may be equipped with up to date or better technology versus another nursing

home facility. In addition, technology has greatly improved and continues to mature and develop to enhance quality of care in nursing homes (Magan, 2013).

Profitability is, not surprisingly, a top focus for FP nursing homes: the profit margin for FP nursing homes treating Medicaid patients in 2010 was 21%, compared to NFP nursing homes treating Medicaid patients (Young, 2012). Clearly, profitability is not a top focus of NFP nursing homes (Alliance for Advancing Nonprofit Health Care, 2011). Megan (2012) noted that NFP nursing homes in New York state had less frequent hospitalizations, higher staffing levels, lower patient acuity, fewer deficiencies (shortages per 100 beds) and more discharges to the patient's home than did FP nursing homes. In 2012, the number of nursing homes nationwide increased to 15,700 with an estimated 1,383,700 residents (Harris-Kojetin et al., 2013). The ownership status of nursing homes varies: NFP nursing homes rely on philanthropy and other government funding. In contrast, FP nursing homes are generally more focused on stock prices and benefiting shareholders (Span, 2012).

RESULTS

For-Profit Financial Trends

A 2010 Department of Health and Human Services study (DHHS, 2010) of Medicare payments to skilled nursing facilities between 2006 and 2008 revealed that FP nursing homes used substantially more ultra-high therapy Resource Utilization Groups (RUGs) than did NFP nursing homes. The higher the RUG classification, the higher Medicare pays (DHHS, 2012). Overall, regardless of ownership status, the rate of classifying and obtaining reimbursements for ultra-high therapy RUGs increased from 17% in 2006 to 28% in 2008 in FP nursing homes, but FP nursing homes were "far more likely … to bill for higher paying RUGs" (DHHS, 2010, p. 11). In addition, 32% of patients in FP homes were categorized in the highest RUGs compared to 18% of NFP nursing homes, and patients in FP nursing homes had longer average lengths of stay than patients in NFP nursing homes. These differences among types of SNF ownership did not appear to be the result of differences in SNFs' beneficiary populations: the average age and the distribution of ages of nursing home patients over the period of the study changed only minimally, and the top 20 diagnoses at admission remained constant (DHHS, 2010). It should be noted that FP nursing homes owned by large chains were the most likely to bill for higher paying RUGs that were nursing facilities owned by NFPs, and in those cases where FPs purchased NFPs, the billing by the FP nursing homes purchased by large chains changed soon after the NFPs were acquired (DHHS, 2010), while the performance of these nursing homes whose ownership changed deteriorated (Grabowski and Stevenson, 2008).

Overview of Selected NFP Financial Statements

The balance sheet for 2013 year from the Overton County Nursing Home of Livington, Tennessee was examined. On a $10 million balance sheet, only $4.5 million accounted for liabilities. In addition, the payer mix/credit risk was much more balanced between Medicare, Medicaid, and private pay. This balance made the nursing home significantly less susceptible to fluctuations by one payer. The Overton home also had an operating loss of $425,604 (Jobe, Hastings & Associates, 2013).

The financial statements of the Alice Byrd Tawes Nursing Home of Crisfield, Maryland was also analyzed. The nursing home showed an operating profit of $214,219 in 2010, an important indicator of financial stability. The overall position of cash and cash equivalents improved from 2009 to 2010 by $150,383. A new building increased assets and liabilities by nearly $9 million (Independent Auditor, 2010). Although the organization's overall financial position appeared respectable, a heavy population of Medicaid patients leaves it susceptible to changes in Medicaid policy, and was noted in the "concentration of credit risk" - gross charges for Medicaid represented $4,114,139 out of $5,313,886 or 77.4% of charges coming from Medicaid utilization (Independent Auditor, 2010).

Organization Ownership Effects on Structure and Performance

Schlesinger and Gray (2006) in a review of over 50 studies of nursing homes, analyzed and compared selected dimensions of performance, including economic performance, quality of care, and accessibility for unprofitable patients. These authors reported that NFP nursing homes had better outcomes across all dimensions. Further, they concluded that FP homes are typically run at lower costs and are potentially more efficient than their NFP counterparts; however NFP homes have been associated with higher quality of services. In a study of nursing

homes in Minnesota, Ben-Ner and Ren (2008) found that FP nursing homes delegate less decision-making power to employees, provide more incentives and fewer fringe benefits, and monitor patients less. They also found FP nursing homes were more efficient, and provided similar levels of service elements that observable to their customers but lower levels of less-well observable elements.

Profit Status and Quality of Care

Process-based indicators such as inappropriate use of restraints, audit deficiencies for restraint use, catheterization rate, tube feeding rate, and inappropriate usage of psychoactive drugs were reviewed by Hillmer et al. (2005). NFP homes were found to provide higher quality of care when evaluated on both process-based and outcome-based indicators. Both FP and NFP have received audit deficiency citations for inappropriate restraint use, but this review of the literature indicated that there was increased use of restraints in FP homes, as well as increased inappropriate use of psychoactive drugs. The research also noted that that lower staffing rates in FP homes were associated with detrimental outcomes for residents. The increased inappropriate use of restraint rates in FP homes has led to higher morbidity and mortality rates.

Staffing levels and Quality of Care

Staffing levels in regards to FP and NFP nursing homes is considered to be a significant predictor of quality of care (Harrington et al., 2012). A 2011 University of California at San Francisco-led analysis (Fernandez, 2011) and a Harrington et al. (2012) report assessed the staffing and quality of the U.S' ten largest FP nursing home chains. These ten FP chains operate over 2,000 nursing homes nationwide, as well as control an estimated 13% of the nation's nursing home beds. The FP chains assessed were found to keep labor costs at a minimum in order to increase profits; therefore not prioritizing quality of care (Fernandez, 2011).

Staffing levels and quality deficiencies were compared at the FP chains to NFP homes. In data gathered from 2003 to 2008, these FP chains had lower levels of RN staffing as well as lower staffing hours than NFP homes. These chains were considered to have the sickest residents, however the combined total nursing hours were 30% lower than their NFP counterparts. The top ten FP chains were also significantly below the national average for LPN staffing, and were also cited for over 36% more quality deficiencies and 41% more severe deficiencies than NFP facilities. These deficiencies included failure to alleviate pressure sores, injuries, inspections, mistreatment of residents, and poor sanitary conditions (Harrington et al., 2012).

McGregor et al. (2005) also assessed FP and NFP staffing levels. Nursing homes that composed 76% of British Columbia's total facilities were selected, 109 NFP and 58 FP. The average number of hours per resident day was higher in NFP facilities for direct care and support staff for all facility care levels. Direct staff included RNs, LPNs, and resident care aids. In comparison to FP ownership, NFP was characterized by an estimate of 0.34 more hours per resident day for direct-care, as well as 0.23 more hours per resident-day for support staff. The authors concluded that public funds used to provide care to frail elderly patients in nursing homes purchased significantly fewer direct-care and support staff hours per resident per day in FP nursing homes than in NFP ones.

--- insert Figure 1 here ---

Figure 1 shows that NFP status is associated with higher staffing as well as higher average numbers of direct and support care hours per resident day. Lower staffing levels and average hours were consistent in FP homes, due to the implication that lower staffing levels were a viable option to maximize profits in a system with fixed costs (McGregor et al., 2005).

For-Profit Homes and Chain Status

Chain participation allows the costs of network participation to be distributed over multiple facilities, making the profit advantages of FP nursing homes available for use in other areas and activities; e.g., transfer learning among different facilities (Elliot, 2007). FP chain participating homes have been heavily debt-financed with stakeholder pressures for short-term profitability, and base managerial decisions on financial priority at the expense of care quality (Kitchener et al., 2008). In addition, FP homes have been generally less concerned about competition in regards to quality of care because they are enabled by resources to conduct marketing campaigns in

order to attract patients. Lastly, FP homes typically have more attorneys and funds to battle regulatory deficiencies, enabling poor quality to have less of an impact on them.

DISCUSSION

The results of this literature review suggested the advantages and efficiency of NFP nursing homes across multiple dimensions. The literature review supported the overall better performance of NFP over FP nursing homes. Higher staffing levels at NFP facilities have resulted in better quality of care and lower mortality rates. Research indicated that NFP homes prioritize quality of care and support resident payments at their own expenses.

The financial aspects of nursing home facilities have also contributed to the quality of care delivered. Research has indicated that FP nursing homes have an advantage over NFP facilities in the fact that they acquire additional resources, such as funds from stockholders and other outside entities. These funds have proven advantageous over competitors in some aspects, but have also shown to be harmful in others. The vision of the FP homes in regards to high profits often results less concern regarding quality of care. FP nursing homes have attracted residents with marketing campaigns instead of enticing potential residents with optimal quality of care.

Although the FP nursing homes have access to capital to cover their neglect to the attention of quality in care, this financial advantage is not enough to keep FP homes ahead of NFP homes across all dimensions. As a result, the quality of care that the NFP nursing homes offer, such as efficient staff levels to care for resident's needs, and proper medicine distribution, exceeds the additional resources FP nursing homes obtain and thus NFP residents are more likely to stay long-term in a nursing home.

U.S. health system implications are essential in complying with certain recommendations in order to battle the inappropriate billing trends of FP homes. For example, stakeholders such as the Centers for Medicare and Medicaid Services (CMS) should take additional precautions to monitor all Medicare payments to FP facilities, increase the monitoring of FP homes that bill for higher level RUGS, and conduct follow ups on FP homes that have been identified as practicing questionable billing. In addition, the CMS should consider changing the methods for determining how much therapy is needed to ensure correct payments. Further recommendations include that the CMS should increase the use of its fraud prevention system, encourage compliance with new therapy assessments, and conduct more reviews of FP claims.

CONCLUSIONS

Benefits and barriers in regards to financial stability and quality of care exist for both FP and NFP homes. Based on the findings of this review, it was suggested that NFP nursing homes have achieved higher quality of care due to a more effective balance of business aspects, as well as prioritizing resident well-being, and care quality over profit maximization in NFP homes.

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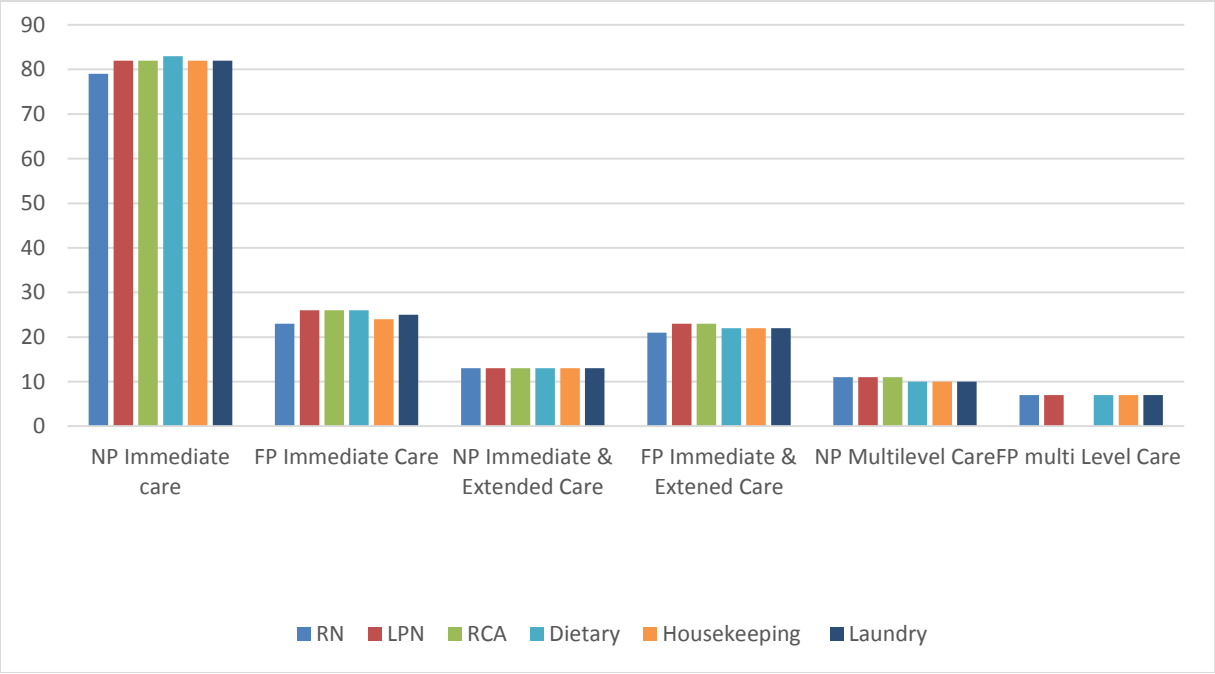
Figure 1. Mean Hours per Resident-day for Individual Job Classifications, by Facility Level and Type of Ownership (data from McGregor et al., 2005)



AN ANALYSIS OF PAYMENT SYSTEMS IMPACT ON MENTAL HEALTH FACILITIES BY TYPE OF FACILITY OWNERSHIP

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ABSTRACT

This paper examines the mental health facilities from the perspective of different payment systems. There are numerous payment systems from private insurance to government programs. Different types of hospitals deal with these payment systems. Medicaid and Medicare are the largest payment systems. Most hospitals accept this payment system. In addition, a large portion of hospitals receive over one-half of their revenue from one source, Medicare and Medicaid being the most frequent. Different payment systems have different levels of reimbursement. If the reimburse level changes, this could mean a large difference in the payments to health care facilities.

INTRODUCTION

The mental health system in the United States is quite large and quite varied. Cases of mental health can be treated in residential programs, in-hospital stays, or by outpatient services. Each of these is unique and provide their own brand of treatment. This paper is going to look at all types program by the type of ownership. There are three types of ownership examined here: private-for-profit, private-non-profit, and government.

In addition, this paper will look at a variety of payment systems, including Medicare, Medicaid, private insurance, a variety of state and local funds, and Veteran Administration funds. The analysis will be done to determine what percentage of each group accepts each type of funding, what percentage of the funds come from each source, and what percentage of the organizations receive over one-half of their funds from one source. Then, the implications of this will be examined.

One of the problems is that the lack of funding or insurance will lead to termination of services. The limitations of public financing could lead to premature termination or a dilution of the quality of mental health services (Frank and McGuire, 1986; Horgan, 1986). In addition, research suggests that premature termination of therapy is more associated with lower socio-economic individuals (Berrigan and Garfield, 1981). Nationally, there are limited funds for the indigent mental health (Frank, 1989). Services are being limited to those who are less severely impaired (Larsen, 1987). This may be a partial cause of some of the recent tragedies in the United States. Individuals who show some signs of mental illness are not receiving the needed care. It has been somewhat demonstrated that Medicaid patients are more likely to receive lower quality services than private insurance patients (Hasenfield, 1985).

Utilization of publicly-funded care is growing. Medicare and Medicaid serve 111 million beneficiaries and $1 trillion in expenditures. This is 43% of hospital revenue and 39% of the national health care expenditures (Altman and Frist, 2015). Health care administrators pay close attention to changes in these programs. A slight adjustment in the reimbursement rates could be monumental. The number of individuals utilizing these programs is only expected to increase, especially with the retirement of “baby boomers”. Medicaid is the third largest domestic program in the federal budget, accounting for 9% of spending. Medicare accounts for 14% of the domestic budget. (Congressional Budget Office, 2015).

In mental health, Medicaid pays for 44 percent of the pediatric stays and 29 of the adult stays (Quinn, 2008). With the scarcity of Medicaid funds, the payment is usually less that the hospital’s cost (Dobson et al., 2006). Hospitals will accept these patients if they have empty beds and the reimbursement covers the variable cost. Medicaid and Medicare patient stays served quite different categories. In 2005, 70 percent of Medicaid’s 7.6

million stays were in obstetrics, pediatrics, and mental health. For Medicare, 96 percent of the stays were in adult circulatory, respiratory, or related categories (Quinn, 2008).

With the advent of the Affordable Care Act (ACA), more individuals are being covered by Medicaid and private insurance. There is no definitive data on what portion of the privately insured individuals have mental health benefits. For those that do have mental health benefits, the quality of the benefits is not known. We do know that many of these private insurance policies that high deductibles.

ANALYSIS OF DATA

The 2010 National Mental Health Services Survey will be utilized to determine the methods of payment for each type of entity: private for profit, private not-for-profit, and government. The survey consisted of 10,374 institutions out of a total of 12,186 entities. Of these facilities, 9.6% were private for profit, 67.2% were private non-profit, and the remaining 23.2% were government owned.

Analysis of the Data

The first questions were whether a facility accepted various kinds of payments. Table 1 presents the results of this analysis. A cross-tabulation was performed for each payment system with the type of hospital, along with the total. For each combination, the number of facilities is given, along the percentage of the type that accepted the payment system. Then, the standard residuals were given. Any absolute value of the standardized residual greater than 2 is considered statistically significant.

The highest percentage belonged to Medicaid. 88.5% of all facilities accepted Medicaid. Only 76.3% of Private for Profit accepted Medicaid that is significantly less that the overall rate. For private-non-profit, 91.1% accepted Medicare. That is significantly larger than the average.

The next highest rate was for Client Fees with an overall acceptance rate of 84.6%. All of the types of facilities were similar to the overall percentage accepting Client Fees.

The third highest rate was for Private Insurance with an overall acceptance rate of 78.9%. Private-for-Profit accepted Private Insurance at a significantly higher rate, 87.2%,

The lowest acceptance rate was for State Education Funds at 21.3%. Government facilities accepted State Education Funds at a significantly lower rate, 16.5%. Other low acceptance rates were U.S. Department of Veteran Affairs, 24.1%; Community Health Block Grants, 24.7%.

This results are not really that surprising. Most facilities have to take Medicare and Medicaid, due to the large number of individuals that they serve. Private Insurance and Client Fees are probably the best paying systems, therefore the large percentages of acceptance. Government entities have lower acceptance rates. This might be due to several reasons. One reason may be the lower reimbursement rates, and another reason may be the amount of "paperwork" required.

Table 1
Funding Accepted by Type of Hospital

Payment System		Private for Profit	Private-non-Profit	Government	Total
Medicaid	Yes	668	5549	1837	8054
	%Yes	76.3%	91.1%	86.1%	88.5%
	Std. Res.	-3.8	2.1	-1.2	
Medicare	Yes	601	4114	1602	6317
	%Yes	68.9%	65.1%	75.2%	69.5%
	Std. Res.	-.2	-1.8	3.1	
State mental Health Funds	Yes	452	4422	1586	6460
	%Yes	52.6%	73.1%	75.4%	71.7%
	Std. Res.	-6.6	1.3	2.0	

State Welfare	Yes %Yes Std. Res.	331 3.1% -3.1	3053 50.5% 6.0	703 45.3% -8.2	4087 45.3%
State Corrections/juvenile justice funds	Yes %Yes Std. Res.	265 30.5% -.9	2100 34.6% 3.1	561 26.5% -4.7	2926 32.3%
State Education Funds	Yes %Yes Std. Res.	182 21.0% -.2	1388 23.0% 2.8	349 16.5% -4.7	1919 21.3%
Local Government	Yes %Yes Std. Res.	306 35.3% -6.0	3029 50.1% .4	1151 54.5% 3.1	4486 49.7%
U.S. Department of Veteran Affairs	Yes %Yes Std. Res.	276 12.7% 4.6	1245 20.6% -5.6	654 31.0% 6.5	2175 24.1%
Community Health Block Grants	Yes %Yes Std. Res.	102 11.8% -7.6	1560 26.0% 2.0	551 26.4% 1.5	2213 24.7%
Client fees	Yes %Yes Std. Res.	765 87.6% 1.0	5061 83.2% -1.1	1853 87.2% 1.3	7679 84.6%
Private Insurance	Yes %Yes Std. Res.	763 87.2% 2.8	4686 77.2% -1.5	1709 80.3% .8	7158 78.9%

The next question dealt with the number of hospitals that received over one-half of their funds from a single source. Table 2 provides the results.

Table 2
Single Source Accounts for One-Half of Funds

		Private for Profit	Private Non-Profit	Government	Total
Yes	**Actual Number**	583	3860	1466	5909
	% With type of Hospital	67.8%	64.6%	70.3%	66.2%

Overall, 66.2% of all hospitals received one-half of their funds from one source. It was highest for government hospital with 70.3%. Private non-profit was the lowest with 64.6%.

Table 3 provides the single source for over one-half of the funds. Medicaid is the largest single provider. 56.7% of all hospitals getting over one-half of their revenues from Medicaid. Medicaid accounts for 61.0% of the single source for Non-Profit Private facilities. The low is for Private-for-Profit at 39.8%. Medicare is the next largest provider for Private-for-Profit at 39.6%. The next largest for Private non-Profit is state mental health funds at 15.5%. The second largest for government was also state mental health funds at 22.8%.

Table 3
Single Source of Funding by Type of Hospital

		Private for Profit	Private-non-Profit	Government	Total
Medicaid	Count % Funding % Hospital Type Std. Residual	229 6.9% 39.8% -5.4	2331 70.3% 61.0% 3.5	756 22.8% 52.2% -2.3	3316 100.0% 56.7%
Medicare	Count % Funding	146 39.6%	204 50.7%	52 12.9%	402 100.0%

	% Hospital Type	25.3%	5.3%	3.6%	6.9%
	Std. Residual	16.9	-3.6	-4.8	
State mental Health Funds	Count	33	594	331	958
	% Funding	3.4%	62.0%	34.6%	100.0%
	% Hospital Type	5.7%	15.5%	22.8%	16.4%
	Std. Residual	-6.3	-1.3	6.1	
State Welfare	Count	13	237	8	258
	% Funding	5.0%	91.9%	3.1%	100.0%
	% Hospital Type	2.3%	6.2%	0.6%	0.5%
	Std. Residual	-2.5	5.3	-7.0	
Stat Corrections/ Juvenile Justice	Count	2	22	5	29
	% Funding	6.9%	75.9%	17.2%	100.0%
	% Hospital Type	0.3%	0.6%	0.3%	0.5%
	Std. Residual	-.5	.7	-.8	
State Education Funds	Count	4	23	1	28
	% Funding	14.3%	82.1%	3.6%	100/0%
	% Hospital Type	0.7%	3.1%	0.1%	0.5%
	Std. Residual	.7	1.1	-2.3	
Local Government	Count	13	120	62	195
	% Funding	6.7%	61.5%	31.8%	100.0%
	% Hospital Type	2.3%	3.1%	4.3%	3.1%
	Std. Residual	-1.4	-.7	2.0	
U.S. Dept of Veteran Affairs	Count	0	0	184	184
	% Funding	0.0%	0.0%	100.0%	100.0%
	% Hospital Type	0/0%	0.0%	12.7%	3.1%
	Std. Residual	-4.3	-11.0	20.5	
Community Service Block Funds	Count	1	6	0	7
	% Funding	14.3%	85.7%	0.0%	100.0%
	% Hospital Type	0.2%	0.2%	0.0%	0.1%
	Std. Residual	.4	.7	-1.3	
Community Mental Health Grants	Count	0	34	6	40
	% Funding	0.0%	85.0%	15.0%	100.0%
	% Hospital Type	0.0%	0.9%	0.4%	0.7%
	Std. Residual	-2.0	1.5	-1.2	
Client fees	Count	39	44	4	87
	% Funding	44.8%	50.6%	4.6%	100.0%
	% Hospital Type	6.8%	1.2%	0.3%	1.5%
	Std. Residual	10.4	-1.7	-3.8	
Private Insurance	Count	94	158	17	269
	% Funding	34.9%	58.7%	6.3%	100.0%
	% Hospital Type	16.3%	4.1%	1.2%	4.6%
	Std. Residual	13.1	-1.3	-6.1	
		Private for Profit	**Private-non-Profit**	**Government**	**Total**
Other Public Funds	Count	2	34	21	57
	% Funding	3.5%	59.6%	36.8%	100.0%
	% Hospital Type	0.3%	0.9%	1.4%	1.0%
	Std. Residual	-1.5	-.5	1.8	
Other Private Funds	Count	0	16	2	18
	% Funding	0.0%	88.9%	11.1%	100.0%
	% Hospital Type	0.0%	0.4%	0.1%	0.3%
	Std. Residual	-1.3	1.2	-1.2	
Total	Count	576	3823	1449	5848
	% Funding	9.8%	65.4%	24.8%	100.0%

	% Hospital Type	100.0%e	100.0%	100.0%	100.0%

CONCLUSIONS

Mental health is an important part of the healthcare system. This paper has examined the various payments systems for mental health by type of government of the healthcare facility. Medicaid and Medicare are important components of the health care system. These payment systems will probably only get larger. A large portion of the each type of hospital (private for profit, private non-profit, or government) accept both Medicaid and Medicare. In fact, over one-half of the funding with either Medicaid or Medicare occurs in 76.1% of private for profit, 66.1% of private for profit, and 55.8% for government hospitals.

One of the problems facing the entire healthcare system is the payment system. There are two major problems. First, shifts in the payment systems may cause fluctuations in the funds received by the health care systems. As the population ages, the percentage of cases paying by Medicare will increase. If Medicare reduces the amount that it reimburses for DRGs, then the health care facility will receive less monies. In addition, under the Affordable Care Act, individuals are required to have insurance or pay a penalty. A lot of the insurance being purchased by individuals, have large deductibles. If the individual cannot pay the deductible, then the healthcare facility may have to absorb that cost.

Second, the government and accrediting are becoming more interested in the quality of care. Healthcare facilities need to document the quality of the care in terms of outcomes. This may be more difficult to document in the mental health system. Back in 1984 at a conference sponsored by the National Institute of Mental Health, it was felt that:

"The most pressing issues in mental health policy, indeed in all of health policy, concern the likely effects of prospective payment systems on costs and patterns of care." (McGuire and Scheffler, 1985).

In addition, it has been suggested that psychiatrists with large Medicaid practices see more patients per week but spend less time with them (Mitchell and Cromwell, 1982). It also has been suggested that Medicaid patients are like to obtain lower-quality services than private insurance patients (Hasenfield, 1985).

The problems facing the funding and level of service in the healthcare industry are daunting but not insurmountable. This is a public healthcare issue that needs to be examined by a variety of constituencies.

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TRACK
HEALTH INFORMATICS

SYMBIOTIC HEALTH INFORMATICS MODEL (CALLED SHIM)

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SYMBIOTIC HEALTH INFORMATICS MODEL (CALLED SHIM)

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ABSTRACT

*SHIM (Symbiotic Health Informatics Model) has unique characteristics, distinguishing it from other health care models. Using SHIM, physician/s make decisions, when the patient is in ER, often unconscious**,** physicians can analyze millions of patient-records in minutes, identify category of the patient, derive the probability of survival of the patient before the treatment, say 15% and possibility of increasing the probability of survival up to 90% or more. Without SHIM, such executions may take about 90 minutes. With SHIM physicians can treat 5 times more patients, physicians and hospitals earn for money, patients pay less and society becomes a better wellness-community.*

INTRODUCTION

Origin of SHIM Health-Care Model

During the last two decades, we witnessed the introduction several type of Information Technologies (IT). The author applied for an internal grant, under the title SHIM. Surprisingly, the application reached the Office of the Vice-President for Research and publications. At the Vice-President's suggestion, SHIM was taken for Patent/licensing by WMU OVPR. All arrangements for patent/licensing procedures were undertaken expeditiously - Two patent lawyers and the Research Program Officer all of them with doctoral degrees, for the author to seek advice.

The Vice President asked the author to expand the SHIM document which resulted in over 80 pages and over 40 PPT slides to explain in a caucus meeting. The Vice President invited 13 experts with specialties in different health-care areas for a caucus meeting to test their reactions about SHIM model. The author made the presentation, the experts greatly appreciated the Model. Then WMU OVPR Vice-President, asked the author to give an estimate of time and cost for implementation. The author replied, "almost two years and $10 million". Then the Vice President asked his counter-part at Borgess Medical center if they would implement the SHIM Model. The answer was absolutely positive.

It is to be noted in this context that it was at Borgess Medical Center that 'stent' was invented and patented first. No wonder, Borgess Medical center is one of the top 100 medical centers in US.

METHODOLOGY

Methods for Creating SHIM

The author, fascinated by emerging technologies such as Artificial Intelligence (AI), Data-Mining (DM), Decision Support Systems (DSS), Data Extraction Transformation and Loading (ETL), Online Analytical Processing (OLAP) was eager to introduce new health-care model. At the same time the author wanted the model to be solidly based Metaphysical and mathematical frame work. This thing led to dialectics of static and dynamic equilibrium. Another critical point was to raise the decision making level from the transactional and managerial levels to the Executive level. Only then, the Physicians will be able to make decisions The final level was concern was to bring about a metaphysical foundation for the intended model to incorporate the constant changes in the patient conditions especially in the ER room. Finally, so far the health-care systems were built with eccentric-focus, due to political, pragmatic and other unknown reasons. This is the most fundamental flow in health-care model. It is obvious, that without patients, there will be no need for physicians, hospitals, medical pharmacies and all other allied agencies. Ergo, the patients should be the center of all health care systems. Hence the author tried to create a

patient-centric health-care system. Because of the drawbacks mentioned above, a methodology deemed to be a compelling necessity to reach the ideal health care model the humanity in general aspire for. It must have a Unique purpose, unique focal point, Unique design, unique development plan, through appropriate test and measurements, and a progressive implementation criterion within the framework goal, tasks, procedures and processes carefully carved with time, and cost for each segment.

SHIM (Symbiotic Health Informatics Model) has some unique characteristics which distinguish it from many other similar models in the health care spectrum. The most important characteristic of SHIM is that it can enable physician/s make decisions, at-the-point-of-care, unlike the transactional systems such as Electronic Medical Records (EMR) or Electronic Health Records (EHR). Consider a typical scenario: A patient is suddenly knocked out at home in a bath-tub, often unconscious. A gadget in the patient's body alerts the ER crew who get the patient to ER often by a helicopter. Once the patient is already in the Emergency Room, at the touch of a Kiosk, SHIM analyzes millions of patient records in minutes, and it detects and identifies the patient to a particular category of patients (by using evidence-based approach). Then it derives pertinent inferences to the physicians for the patient 'at-the-point-of-care'. SHIM will show the probability of survival of the patient before the treatment, say 15% and possibility of increasing the probability of survival up to 80% to 95% or more, by changing treatment procedures, and other related attributes. All these happen in minutes, thanks to this modern technology. The physicians evaluate those recommendations and execute them. Usually, without SHIM, such an execution of decision making takes place in one or two hour. But with SHIM model, the Physicians could make the final decision in 10 to 20 minutes.

Thus using SHIM, the physicians can take care of 5 patients instead of 1 patient, about 5 times more patients can be saved, and the hospitals and physicians earn for 10 times more money, patients pay less and the society live more peacefully, and finally through SHIM, we can bring about a better wellness society. Eventually, our world could be a better place to live in.

The afore-mentioned scenario is fascinating indeed. Now we will try how SHIM can execute such a scenario. This calls for a brief explanation of the embedded components of SHIM. SHIM is built on several modern technology components which are collectively called Business Intelligence (BI). Mainly it has four functions, a) Reporting solutions for general work force, Analytics and Online Analytical Processing tools for business analytics, c) data mining solutions and predictive analytics for specialists, and d) Microsoft Excel or some other spread sheets for your help. Ideal Technology for Business Intelligence include integrated suite of user interface, single integrated environment for data lineage for corporate governance, MS Excel for cost owner ship and so on.

Product and its components which include Web Report Studio, Add-in for Microsoft Office, Enterprise Guide for online analytical processing (OLAP) Information Delivery portal, (ETLQ) for extraction, and Meta Data Repository for browsing and searching, delivery, Data-Mining (DM) for mining data, and many measurement methods which include neural networks, Regression Analysis, Decision trees.

RESULTS

The results consist of a) Completion of SHIM Model, b) Testing the model called instantiation and c) Implementation of the model SHIM d) Future plans for expansion of SHIM.

Completion of SHIM Model

Creation of SHIM model is complete. The model is created using JAVA SCRIPT, ii) Demonstration the instantiation Model to the Vice-President and his crew for their suggestions for improvements is yet to be done, although the author is ready demonstrating to the Vice-President. It is getting delayed due to holidays, vacations, inclement weather (9" snow) and the infamous Kalamazoo Shooting spree. iii) The author hopes to complete the demonstration of instantiation within a fortnight, iv) Presentation of the Instantiation to a caucus group, similar to what we have done when we presented the idea to a Prominent Medical group. It might take place a month after instantiation approval from the Vice President and his crew, and v) Demonstration the instantiation of the SHIM model to a caucus group, similar to the Presentation of the concept of SHIM. It might happen in August.

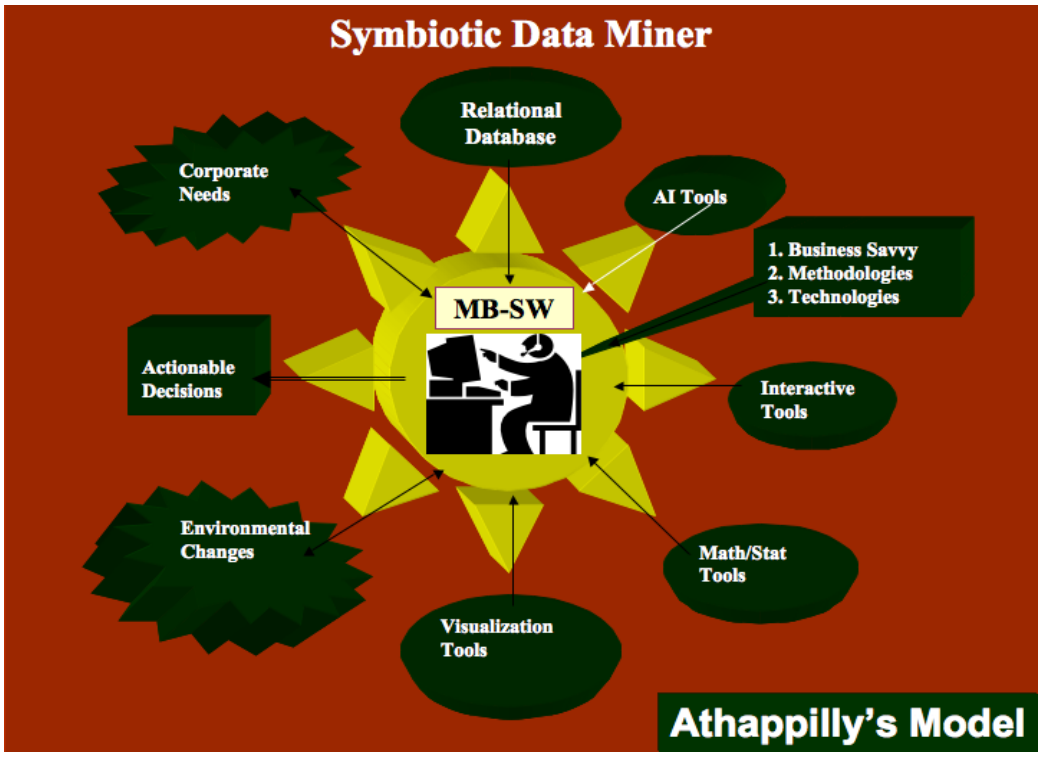
The Implementation of the Model

The author will be working with Zealogics LLC technology company to implement the model with its in-house experts and off-shore crew specifying the detailed chart of tasks, time and cost. Implementation project. Once implemented, there will be a permanent crew from Zealogics LLC technology company for maintenance,

The Nature of the Present Paper

The author intends to high light the special features of the SHIM model showing "What it is and Why it is, but not How it is". To begin with, the author introduces the model and its integral parts using the following diagram:

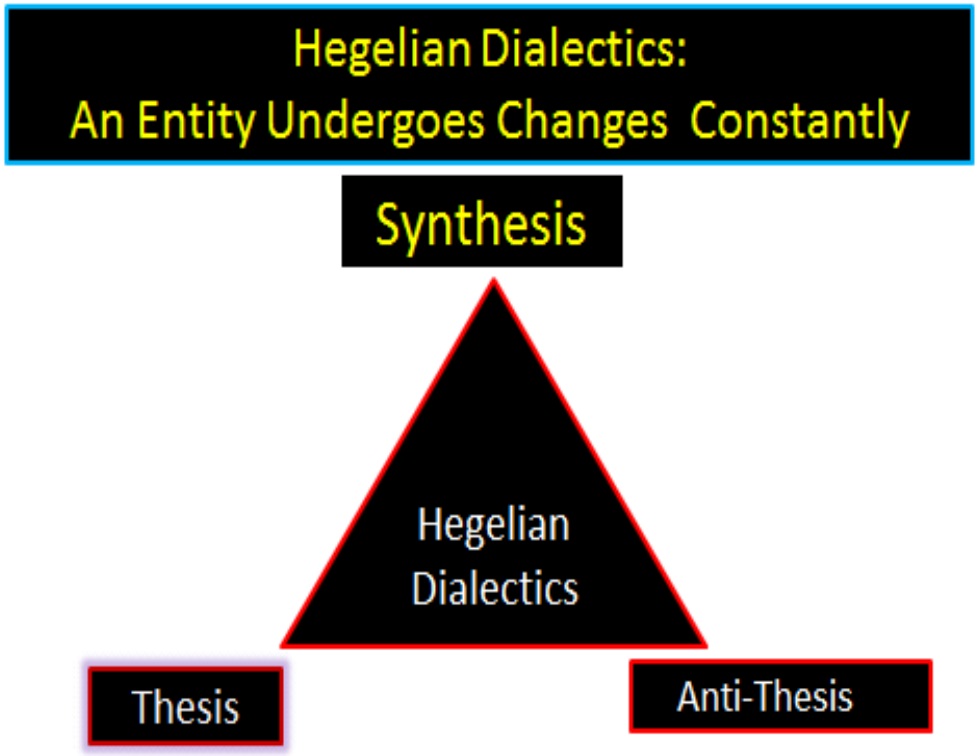
Figure 1: A Diagrammatic Representation of Athappilly's SHIM Model



The Central Piece is the data miner personified. Its ultimate purpose is to help physicians make the best possible decisions, when the patient is 'at-the-point-of-care'. The model diagram describes in a simple view the essential ingredients of the model. It uses many tools such as AI, Stat/Math, and visualization. The fundamental basis of the SHIM model is Symbiosis, which is a unique Approach for Cohesiveness of among Physicians, health-care provider, and the patient and for all other stake holders such as business entrepreneurs, insurance agencies, pharmaceutical companies, and the Federal, State and local government regulators.

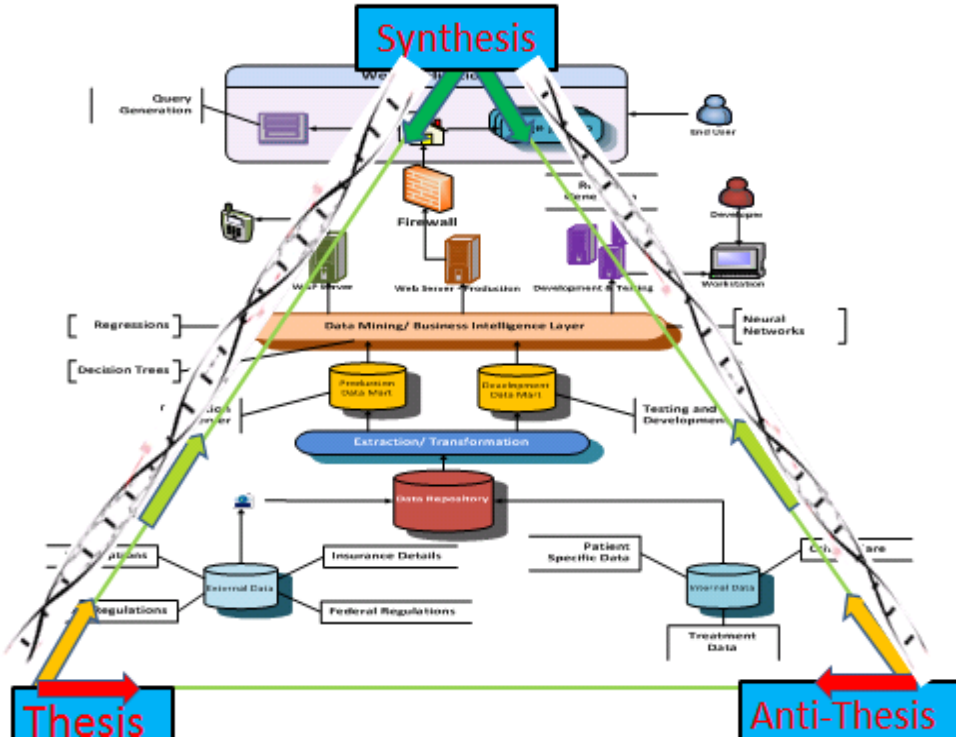
Symbiosis has its foundation based on two mutually complementing theories: 1) Hegelian triadic approach and 2) Walrassian dynamic equilibrium. Hegelian theory establishes the encounter between the patient at the point-of-care (thesis), and the physician/s (anti-thesis) and solution is brought about by mutual interaction between the physician/s and the patient, (synthesis). Since two objects, especially living beings do not remain in a status quo; Philosopher Walrass introduced dynamic equilibrium theory, because to accommodate the changing nature of living objects. The following diagram consists of a static triad, represented by triangle, it keeps a static equilibrium. But no living object is static.

Figure 2: Hegelian Static Equilibrium encounters an incompleteness for the living objects.



Because of the continuous changes, the model is represented by a helical spiraling akin to the DNA structure.

Figure 3: Metaphysical Foundation-Walrassian dynamic Equilibrium



If implemented properly, the unique characteristics of the proposed system, SHIM Model can be a truly realistic and universal health-care solution.

Instantiation of the Health Care Model

Demonstrate the status of the model and future expansion of the in Michigan and beyond. A brief statement of research accomplishments in their discipline in the past three years should be included. For Developing and Expanding a Health Care Model called Symbiotic Health Informatics Model (SHIM).

Nature and Significance of the Research Project:

The Symbiotic Health Informatics Model (SHIM) is a computer application system that assists clinicians in the management of their patients from the point-of-care. SHIM works by integrating medical Knowledge with patient characteristics and generates patient-specific recommendations. Over the last two decades Information Technology (IT) has been incorporated into patient care and has significantly impacted patient care by improving patient safety, decreasing heath care costs and enhancing quality of treatment. IT in patient care began as a result of Transaction Processing Systems (TPS) such as electronic medical record (EMR) keeping and bar coding systems attributed to medications and from there the data was deployed into a database management system which facilitated structured patient queries. Before long, several types of advanced IT systems emerged to support decision making at various levels of health care management, including critical care.

The significance of this study, therefore, is to design, develop and deploy an integrated critical care information system (SHIM) in order to assist clinicians in the management of their patients at the point-of-care. SHIM will be able to monitor data streams—for example, vitals—and medical records retrieved electronically. SHIM will provide a variety of services such as computerized reminders, alerts, guidelines, recommendations, order sets or other similar tools to clinicians. Today's critical care clinical settings are characterized by multi-professional teams and degrees of involvement. The SHIM is deemed to be almost inevitable to cultivate clear and concise communications within the entire group. Objectives for the SHIM project are to: 1) Integrate medical knowledge with patient characteristics and 2) Generate patient-specific recommendations. To achieve the objectives, the

proposed SHIM requires specific capabilities: a) to access and monitor data streams and electronic medical records, b) to provide recommendations through computerized reminders, alerts, guidelines, order sets or other similar techniques, c) to engage in multi-professional-team involvement, d) to access up-to-date information regarding insurance policies related to coverage, procedures and prescriptions, and e) to access federal and state regulations and guidelines regarding prescription drugs. An ideal system will be designed with an easy to use front-end KIOSK; each button of which is wired into a back-end system of an integrated network with online transactional processing (OLTP), as well as online analytical processing (OLAP) capabilities, to input pertinent patient information at a touch for ad hoc decision-making at the point-of-care.

However, these afore-mentioned systems were mostly designed and developed to act as isolated systems. Hence they did not communicate with each other. Therefore, an individual patient's EMR data cannot be linked directly to their medications data. Also, the systems had not fully deployed emerging technological advances such as Artificial Intelligent (AI) modeling, data mining and business intelligence, which would improve the performance quality of IT used for patient at-the-point-of-care substantially.

CONCLUSION

The applicant has been working on this health care model for the last 20 years, and has published several papers in reputed journals, completion and expansion of SHIM is my passion, based on the firm belief that this model will do a lot of good for not only the patients, but also the physicians, medical institutions, and all their related agencies to make their state a wellness center. All these might happen because the model is all inclusive since SHIM integrates all those model in the SHIM environment.

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TELESTROKE: AN APPROACH TO THE SHORTAGE OF NEUROLOGISTS IN RURAL AREAS

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ABSTRACT

Telestroke has provided swift, lifesaving treatment and has afforded patients the ability to be treated in an efficient manner in rural areas where neurologists may not always be available. It has been reported that Telestroke in rural areas has increased the ability to treat patients by being able to access a neurologist for assistance in evaluating the patient to determine if administering lifesaving in treatments were needed. The utilization of Telestroke has been shown to increase the use of IV Tissue Plasminogen Activator (tPA) which improves outcomes such as better quality of life, lower disability and improved rehabilitation. Employment of Telestroke is discussed as an efficient means of providing 24/7 neurological consultation to stroke patients in rural hospitals. Employment of Telestroke is discussed as an efficient means of providing 24/7 neurological consultation to stroke patients in rural hospitals.

Key Words: Telestroke, Neurologists, Rural Hospitals, Neurologists in rural hospitals, Cost

INTRODUCTION

According to the Centers for Disease Control and Prevention (CDC) in 2015 stroke was the fifth leading cause of death in the United States (U.S.). Those who survive are classified among the highest and most serious long-term disability patients. Stroke is a disease with a high social and economic impact (Wechsler et al., 2013). The incidence of stroke is about 800,000 cases per year (Roger et al., 2012). It has been estimated that the total cost of strokes in the U.S, was 38.6 billion in 2009; taking into consideration the expenses related to healthcare services, medication and lost productivity (Kulscar, Gilchrist & George, 2014).

In recent years, treatments administered within the first few hours by a qualified specialist have shown to reduce mortality and improve prognosis in stroke patients by 30%. The first 60 minutes after the onset of stroke symptoms is crucial to begin treatment in order to minimize long term disability or avert stroke death (Bresnick, 2013). It has been reported that in 2005 that nearly 1.1 million stroke survivors had reportedly struggled with performing basic daily activities (Kulscar et al., 2014).

According to the 2013 Population statistic Census, approximately 19.3% of the U.S. population lives in rural areas, many of which lack permanent presence of an expert neurologist. Telemedicine for stoke, also known as telestroke, helps to bridge the gap between treatment time and shortage of neurologists in rural underserved areas (Nagao, Koschel, Haines, Bolitho & Yan, 2011). Neurologists with stroke care expertise, usually located in urban areas, are not always feasible destinations for Emergency Medical Services (EMS) transporting stroke patients from rural areas. Based on a 2009 national study of EMS response times, it was estimated that only 22% of the U.S. population in a rural area lived within a 30 minute drive to a neurologist staffed medical facility (Albright et al., 2010).

In a broad scope, telemedicine is the practice of medicine at a distance, assisted by the electronic transfer of data through audio and video (Kazley, Wilkerson, Jauch & Adams, 2012). Telestroke is a cost effective delivery method that enables neurologists to provide life-saving treatment to stroke patients in rural areas that lack access to physicians with adequate stroke knowledge and expertise. Under the telestroke model, neurologists are enabled to communicate, using digital technology, with on-site physicians who are treating patients at facilities that do not have adequate stroke expertise. An off-site neurologist can perform neurological assessments of a patient, evaluate brain

imagining and aid bedside healthcare providers in diagnosis and treatment, including administering IV tPA which is a clot busting drug that reduces mortality and long term disability (Schwamm et al., 2009).

Physician administered tPA is the only Food and Drug Administration approved treatment for ischemic strokes. By dissolving the clot and increasing blood flow to the brain, tPA that is given between three to four and a half hours from the onset of symptoms can improve the recovery of a stroke (Adeoye et al., 2011).

According to the American Heart Association, telestroke is about developing a network connection through audiovisual systems that allows physical examination of the patient from a distance and evaluation of complementary tests such as a CT or MRI. The neurologist referral center can better identify those patients who will benefit from the transfer and indicate the appropriate treatment, saving crucial time in this pathology (Timpano et al., 2013).

The purpose of this research was to explore the shortage of neurologists in rural areas to determine if telestroke can impact stroke intervention in rural hospitals.

METHODOLOGY

The primary hypothesis of this study was how the use of telestroke in rural health facilities can increase quality outcomes of stroke intervention in hospital emergency rooms if neurologists are not available.

The method for this study was a qualitative study using literature review. The Marshall University Drinko library in Huntington, West Virginia was used for full text articles, utilizing the PubMed, EbscoHost, WorldCat and ProQuest databases. Google Scholar was used when articles could not be located through the above mentioned data bases. Terms included in the search consisted of 'telestroke' AND 'rural hospitals', OR 'hospital reimbursement', OR 'neurologist', OR 'shortage of neurologists in rural areas', OR 'cost', OR 'outcomes'. Reputable websites of CDC, United States Census Bureau, American Heart Association and American Telehealth Association were also used. Articles were limited to the English language. 38 articles were selected for this research. Further, a semi-structured interview with an expert clinician well versed in emergency medical treatment of strokes in a regional ER that utilizes a telestroke hub-model added to the data collection was performed. This clinician will be referred to as Expert in ER telestroke throughout the review. This search was completed by SM, JAP and AS and validated by AC, who acted as a second reader and also double checked if references met research study inclusion and criteria.

RESULTS

Impact of Telestroke Technology

The unavailability of neurological consultation and recommendation is accentuated if studies are considered that show thrombolytic treatment. It is effective in specialized centers, but ceases to be if administered in hospitals with little experience and few patients (Biglan et al., 2012). Usually patients arriving at a local hospital with a suspected acute stroke are urgently transferred to a large regional medical center (Ickenstein et al., 2005). This move typically takes 30 to 90 minutes, the patient is re-evaluated by the neurologist on-call. Under these conditions, in most cases, the therapeutic window of four and a half hours for thrombolytic therapy has been consumed, thus depriving virtually all strokes that start in rural areas of the most effective treatments for the acute phase (Hyland, 2013). In cases where it is possible, safely administered intravenous tPA, transfer loss is very important in time as it is well known to have a negative impact on subsequent functional recovery (Hoody, Hanson, Carter & Zink, 2008). Initiatives to reduce latency to medical helicopters have managed to moderately increase the number of patients treated with tPA, although at a high cost benefit due mainly to 80% of patients transferred are ultimately not candidates for thrombolytic therapy (Müller-Barna et al., 2014).

Despite its limitations a healthcare model based on urgent road transport of stroke patients have a positive impact on evolution, since a seemingly simple measure as urgent evaluation by a neurologist clearly improves prognosis because it allows the immediate adoption of the most appropriate therapeutic measures and early identification of complications (Agarwal & Warburton, 2011; Cho et al., 2008). In order to save time, new protocols have been developed where suspected stroke patients bypass the nearest downtown hospital thus shortening treatment and increasing the percentage of candidates for thrombolytic treatment (Ganapathy, 2004). Strategies are

included in the 2012 recommendations from the Brain Attack Coalition however there is a widespread view that the new Information Technology and Communication has to play a key role in the future (Schneck & Morales-Vidal, 2012; Storm, Gunzel & Theiss 2011).

There are different types of technology able to transmit the necessary information between centers, although the technology chosen can vary in medical centers, the criteria requires a fast, reliable and quality communication method. The adoption of telestroke should be individualized in each case according to the characteristics and pre-existing technology in each medical center. A study published by LaMonte et al. (2008) evaluated the effectiveness of telestroke services compared to in-person services and found patients were diagnosed and treated more quickly when receiving telestroke assessments than those relying on in-person assessments, 17 minutes versus 33 minutes. The telestroke systems have evolved to the point that they are readily available which allow the consulting neurologist to remain in one place while waiting for the patients results (Choi & Urban, 2002).

According to the Expert in ER Telestroke, small rural facilities lack neurologists' onsite to evaluate and treat stroke patients. The shortage of neurologists in rural areas is a multifactorial problem. First, the rational of staffing a full-time neurologist may not be justified in a small rural facility. Cost to recruit and retain such specialist could be difficult to fund thereby limiting the compensation a rural facility could support. Additionally, smaller facilities may lack of technology to provide the necessary services to a treat a stroke patient. The Expert noted a solution to neurology shortages in rural facilities; it has been the utilization of telestroke that can be used to treat patients at the bedside using telestroke technology. Using this technology the patient is evaluated by a neurological specialist who can treat the patient instantaneous. Telestroke is directed to the patient's bedside where the neurologist on the other end, controls the camera to have access to view the patient. The process is efficient and allows for the timely treatment to reduce the cells from being deprived of oxygen. The Expert works at St. Mary's Medical Center, which provides services to rural facilities and noted the process works well and allows for a direct link to a specialist. The Expert noted that while hospitals are gaining access to these services there are others who have not implemented due to existing technology and cost (Expert in ER Telestroke, 2015). Depending on the vendor, prices and maintenance cost per month will vary, however one high-end estimate in 2011, was between $5,000-$6,000 per month for telestroke with 24/7/365 network on-call coverage, with integrated security socket platform (Freeman, Barrett, Vatz & Damerschalk, 2012).

Impact of Telestroke on Quality

Telestroke is a safe and feasible tool for stroke diagnosis to enhance tPA utilization and improve long term outcomes. The tPA administration rate, during a recent study, was shown to have increased to 55% and in some cases used in hospitals for the first time. When tPA is managed, stroke patients can experience significantly improved outcomes, such as better quality of life, decreased rates of disability and improved rehabilitation (Fang, Cutler & Rosen, 2010). The cost efficiency of telestroke is realized through reduction in disability and associated long-term care (Zanaty et al., 2014).

Telestroke Cost Benefit and Reimbursement

Prior to telestroke, possible stroke patients were transferred to larger medical centers. Later was the introduction of Telephone Advice that was used to reduce the amount of transfers out though non-visual physician consultation (Handschu et al., 2014). In both cases, patients were unnecessarily transferred out, which not only reduced reimbursement for the rural hospital, but also increased the expenses to the rural hospital for the actual transportation cost of the patient if not covered by insurance (Demaerschalk, 2011).

There are financial barriers to implement telestroke. Costs are broken down into four categories, equipment, installation and maintenance, training and clinical resources. While costs vary, the average cost to implement telestroke is $46,000 (Miley, 2009). Either the hub or spoke hospital can pay the expenses related to costs of telestroke (Hess & Audebert, 2013). According to the researcher these expenses could be fees for the neurologist in the form of on-call pay, costs for hardware infrastructure, and fees to a third party vendor for consulting. Additionally, most programs rely on public sector financing which are usually associated with academic medical systems, however these programs are typically restricted to rural areas.

A summary of reimbursement by the American Telehealth Association in 2013, has noted that while Medicare has lagged behind other payors, currently, the reimbursement has been the same for telestroke, from

January 2007 to January 2013, as it is for face-to-face with three restrictions: location, qualifying facility and approved procedure.

DISCUSSION

The purpose of this research was to explore the shortage of neurologists in rural areas to determine if telestroke can impact stroke intervention in rural hospitals. The results of the literature review and interview with an expert in the field have suggested telestroke has had a positive effect on treatment of stroke patients by allowing a more timely assessment which enables earlier use of IV tPA. The literature review supports telestroke an alternative to neurologists on-site in rural area hospitals (Avitzur, 2010).

Telestroke has permitted hospitals without access to neurologists to provide management of thrombolytic therapy in stroke patients. Patients displaying symptoms of stroke can be observed by a neurologist, who can also see the patient's brain scans for damage caused by a hemorrhage or a blocked artery. A significant part of the population living in geographically remote areas of large hospitals and the permanent presence of an expert neurologist at each of the district hospitals is unfeasible. There have been several strategies to address these problems and one of them is telestroke (Wechsler et al., 2013). This system consists of the development of hospitals networked together using audio visual technology that allows remote physical examination of the patient and evaluation of tests. The neurologist can better identify those patients who will benefit from the transfer and indicate the appropriate treatment.

The process of medical decision making is guided by the neurologist who uses telestroke to evauluate the patient in a rural setting. A decision must be made to transfer the patient, start IV tPA and transfer to a referral hospital or utilize telestroke to treat the patient at the rural hospital. This was confirmed with the semi-structured interview with an Expert in the field of ER telestroke. The Expert confirmed that when rural facilities implemented telestroke, it improves access to stroke care however it has been noted that implementation costs, which are estimated at $46,000, prohibits implementation at some facilities.

The literature review was limited in the area of reimbursement due to the frequently changing policies within various governmental and commercial payors. It has been observed that telemedicine network; either urban or rural, both need a significant capital investment for equipment and technical support. Hence, the components of the total cost of development and maintenance of telestroke network includes the equipment, support of information technology, the essential administrative and clinical personnel along with personnel training and education. The successes of telestroke programs are dependent upon having the financial means to sustain the program (Silva, Farrell, Shandra, Viswanathan & Schwamm, 2012).

CONCLUSION

The application of technologies of communication and information improve the efficacy and efficiency of treatment of acute stroke in patients presenting to the emergency department of a rural hospital. Telestroke is suggested to be effective in stroke pathology when a neurologist is unavailable. Telestroke provides enhancement of utilization of tPA and when tPA is managed, stroke patients experience a better quality of life, decreased rates of disability and improved rehabilitation.

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APPENDIX A

Questions for Semi-Structured Interview with an Expert in ER Telestroke on March 15, 2015

- Why is the timing of stroke treatment important?
- Why is there a need for telestroke in the treatment of stroke?
- Why is it important for patients to see a stroke specialist as opposed to general doctor?
- How have you used telestroke to solve the problem of diagnosing and treating stroke patients? How fast is it?
- How does the process work?
- How is telestroke in the ER working?
- What are the main barriers in implementing telestroke?
- Will patients still need to see a specialist in person?
- Is your facility supporting any other hospitals via telestroke (i.e., acting as a hub to another hospital)?
- If so, how is that working?
- Do the rural hospitals you support experience a shortage of neurologists? Is that why they opted for telestroke?
- What is the driving factor or most common reason rural hospitals experience a shortage of neurologists?
- In your experience, is the process efficient?

BARRIERS TO ADOPTION OF WIRELESS BODY AREA NETWORKS IN HEALTHCARE: A LITERATURE REVIEW OF TRENDS

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BARRIERS TO ADOPTION OF WIRELESS BODY AREA NETWORKS IN HEALTHCARE: A LITERATURE REVIEW OF TRENDS

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ABSTRACT

Real-time personal health monitoring is gaining new ground with advances in wireless communications. Wireless Body Area Networks (WBANs) provide a means for low-powered sensors (affixed both inside and outside a human body) to communicate with each other as well as with external telecommunication networks. The benefits of such technology in healthcare range from continuous monitoring of patient vitals to measuring post-acute rehabilitation time and improving quality of medical care provided in medical emergencies. However, there are barriers to its adoption including security concerns, usability and technology interoperability. This article presents a literature survey of the barriers to adoption of real-time health monitoring using WBANs. The search criteria focused on peer reviewed articles that contained the keywords ("wireless body area network" AND "adoption" AND "challenges") or ("wireless body area network" AND "adoption" AND "barriers"). This article is expected to benefit the academic researcher and the practitioner alike, by identifying gaps in the implementation of the technology and highlighting opportunities to improve related products and services.

Key Words: Wireless Body Area Networks (WBANs). Body Area Networks (BANs). Barriers to WBAN Adoption. Healthcare. Patient Monitoring.

INTRODUCTION

Advances in Information and Communication Technology (ICT) have made it possible for real-time transmission of biological information from the human body over a communication network for remote storage. Such real time transmission takes place through the use of Wireless Body Area Networks (WBANs). From a healthcare delivery perspective, this opens up avenues for efficient monitoring by increasing patient mobility while also facilitating a geographically-agnostic monitoring facility. From a patient perspective, benefits include improved quality of care and cost savings.

The IEEE 802.15 standard defines a Body Area Network (BAN) as "A communication standard optimized for low power devices and operation on, in or around the human body (but not limited to humans) to serve a variety of applications including medical, consumer electronics / personal entertainment and others" (IEEE Standards Association, 2008). Numerous definitions of WBAN have been proposed, one such by Khan & Yuce (2010) being "A special purpose sensor network designed to operate autonomously to connect various medical sensors and appliances, located inside and outside of the human body" (p. 591). Miniature devices containing sensor nodes that monitor biological and physiological signals, process and transmit them wirelessly are worn or implanted in the human body.

A WBAN operates in the range of 1-2 meters range of the human body (Hughes, Wang & Chen, 2010). Figure 1 shows a typical configuration set up of a WBAN. Several sensor nodes are placed either on the human body, or, implanted within the human body (*in-vivo*). They monitor, capture and transmit biometric measurements like Electrocardiograms (ECG), blood pressure, glucose levels, limb movements etc. to an on-body "control" unit, usually termed as the Body Coordinator (BC). This device in turn assimilates and transmits data over a Wireless Local Area Network (WLAN) or a Wide Area Network (WAN) or the Internet to a remote healthcare monitoring facility, thus making for an end-to-end wireless communication system.

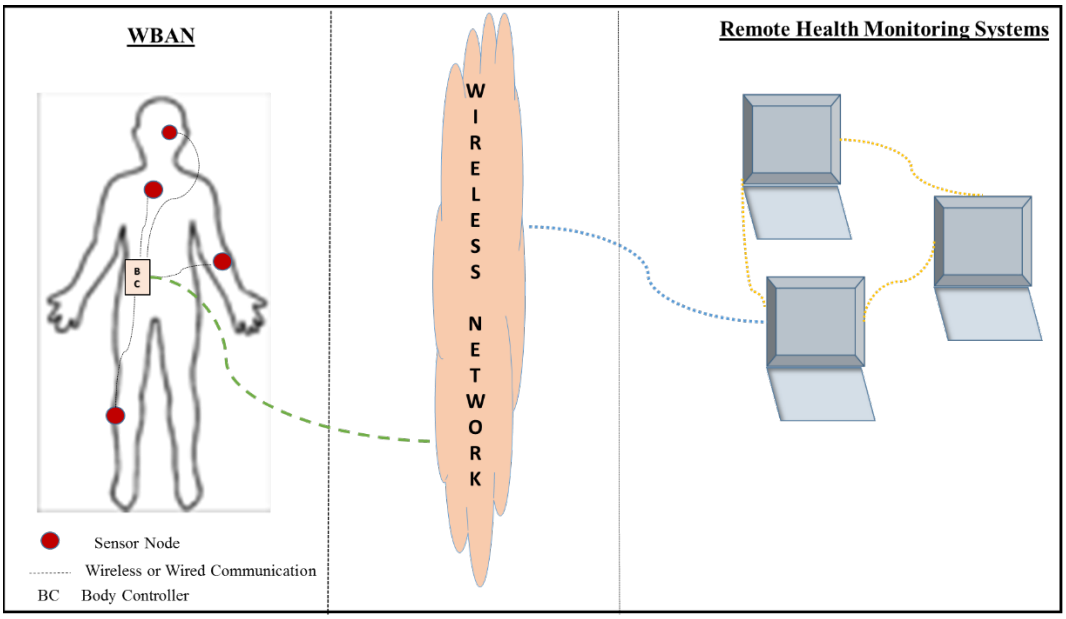

Figure 1. Typical WBAN Configuration

MATERIAL AND METHODS

The aim of this study was to survey documented challenges and barriers to WBAN adoption in research literature. To that end, a systematic literature review was conducted on *PubMed*. The search criteria focused on peer reviewed articles that contained the keywords ("wireless body area network" AND "adoption" AND "challenges") OR ("wireless body area network" and "adoption" AND "barriers"). Findings from articles that met this criteria have been reviewed in subsequent sections of this article. Articles were reviewed for relevance and those that were not found germane to the study were excluded. The literature review process resulted in 11 relevant articles after the filtering process. This speaks to the lack of many research papers in this specific area of study and the need for more focused research in this area.

RESULTS

From the literature review it was found that the challenges and barriers broadly fell under two categories: Technology Barriers and Social Barriers. Tables 1 and 2 summarize the findings relating to the Technology Barriers and Social Barriers which are discussed in some detail in the following section.

Table 1.
Technology Barriers

Article	Technology Barriers Identified
Hughes et al. (2012)	1. Balance between Quality of Service (QoS) characteristics and low energy footprint
	2. Lack of efficient low power protocols
	3. Reliability characteristics
	4. Security characteristics
Costa, Novais & Simoes (2014)	5. Maturity of complementary technology (Artifical Intelligence)
Kabir, Ashrafuzzaman, Chowdhury & Kwak (2010)	6. Signal attenuation characteristics of communication
Lai et al. (2013)	7. Need for elongated battery life
	8. Requirement to minimize power consumption
	9. Complexities in prioritizing emergency vs. regular communication

	10.	Quality of communication links
	11.	Security characteristics
Kartsakli et al. (2014)	12.	Complexity of technology integration
Kamel et al. (2009)	13.	Maturity curve of technology
Yilmaz, Foster & Hao (2010)	14.	On-body propogation characteristics
Monowar, Hassan, Bajaber, Al-Hussein & Alamri (2012)	15.	Energy efficiency requirements
	16.	QoS Characteristics
Coskun, Ozdenizci & Ok (2015)	17.	Security characteristics
Patrick, Griswold, Raab & Intille (2008)	18.	Technology interoperability

Table 2.
Social Barriers

Article	**Social Barriers Identified**	
Hughes et al. (2012)	19.	Ease of use
	20.	End-user inexperience
	21.	Trust
Lai et al. (2013)	22.	Ease of use
	23.	Limitations in human subject availability
	24.	Potential health hazards
Yilmaz et al. (2010)	25.	Cost
	26.	Usability
Patrick et al. (2008)	27.	Cost
Marcroft, Khan, Embleton, Trennell & Plotz (2014)	28.	Health condition of subjects on whom used
	29.	Lack of skilled clinicians to administer and monitor

DISCUSSION

Technology Barriers

The technology barriers center on balancing critical Quality of Service (QoS) attributes, security, and maturity of the technology itself against logical constraints in deploying WBANs. Each of these is presented next.

Quality of Service (QoS)

Key Hughes et al. (2012) define QoS as a measure of service quality that the (communication) network offers to applications and users. WBANs operate in an environment of limited network bandwidth and energy, low memory footprint and transmission power. At the same time, there are relatively high QoS requirements to comply with including reliable transmission of patient physiological signs, minimal network packet loss and transmission delays as well as the ability to discern and interpret normal physiological signs from emergency readings. Hughes et al. (2012) discuss the relative merits of numerous WBAN protocols in overcoming these challenges, but highlight the lack of efficient low power protocols as a major area of continued research.

Both Lai et al. (2013) and Hughes et al. (2012) emphasize as a challenge to be overcome the lack of long term battery power sources which is related to the size of WBAN nodes. To compensate for this the sensor nodes need to be designed with very low power consumption characteristics, which becomes an additional constraint. Lai et al. (2013) cite advancements in wireless power technologies and harvesting power from surrounding electromagnetic environment as a potential long-term solution to the battery problem. This continues to be a research in progress.

Monowar et al. (2012) point out the nuances in variation of QoS requirements in a healthcare setting. For example, an Electrocardiogram (ECG) monitor has strict requirements with respect to delay and reliability requirements, while a respiration monitor, while having a high reliability requirement may tolerate some latency in capturing readings. This heterogeneity in QoS requirements within a *single* WBAN creates a complex ecosystem. A

majority of the WBAN protocols are not designed to take advantage of this nuance, thereby over-estimating and over-allocating resources of an already power-constrained WBAN. In response, a more energy-efficient WBAN protocol capable of adapting to the multiple constraints listed on which they have run several lab simulation tests has been proposed. However in the author's opinion, a far more robust set of tests across multiple real-world scenarios are necessary before this proves to be a viable solution to the problem. Complementary technology like Ultra-Wide Band (UWB) communication exist which satisfy several QoS characteristics above. However, Kabir et al. (2010) cite inherent constraints such as high signal attenuation while traversing the human body, as a constraint to its large-scale adoption. Yilmaz et al. (2010) refer to the phenomenon of *de-tuning* (i.e.) loss of signal transmission frequency of sensors placed on the body, relative to free space. All of these make for unique technological challenges in effectively designing WBAN networks.

Security

WBANs transmit sensitive health information and hence it is critical they adhere to strict security requirements. Hughes et al. (2012) highlight the fact that WBANs carry the same amount of risk and are vulnerable to the same form of attacks like network eavesdropping and Denial of Service (DoS) because they leverage wireless communication as the transmission medium. They cite the limitation of energy consumption in a WBAN scenario as a current barrier to designing security-heavy communication protocols. In addition to the technology challenges of securing a WBAN, they emphasize the operational challenge for network designers – that of setting up appropriate processes and training for non-technical personnel which would operate and handle this technology on a daily basis. Lai et al. (2013) highlight the need for protocols to differentiate between inherent sensor node anomalies and malicious misbehaviors injected from the surrounding environment. While echoing some of these challenges, Coskun et al. (2015) present a complementary technology – Near Field Communication (NFC) for use in WBANs to address some of these security concerns.

Technology Maturity

Kamel et al. (2009) surveyed numerous cutting-edge research projects underway in Europe that focused on furthering WBAN and related technology's adoption in healthcare. An interesting fact they highlight is that while there is a high concentration of academic research is these areas, the relative number of commercial products leveraging such technologies are still very less. They cite documented challenges such as lack of suitable infrastructure in real-world settings to both evaluate and deploy such technologies, several disparate and emerging technology standards leading to interoperability challenges and legal and privacy issues, and current financial business models of healthcare enterprises as factors inhibiting wider and deeper market penetration of such technologies.

The end-to-end infrastructure involved in WBAN communication shown in Figure 1 involves seamless integration of a wide range of medium and long range technologies while assuring the QoS characteristics. Kartsakli et al. (2014) stress that the heterogeneity of the hardware devices involved, coexistence and interference inter-WBAN systems, and other technologies deployed in a typical healthcare setting as key challenges to overcome for a successful implementation. Patrick et al. (2008) share this perspective in their study on the feasibility of leveraging mobile phones in the WBAN ecosystem. While numerous studies point to early successes, they allude to interoperability issues among mobile phone software and service providers as limiting factors to its wide-spread adoption. Costa et al. (2014) underline the compatibility of complementary technology used in the healthcare domain as yet another limiting factor. For instance, Artificial Intelligence (AI) has been widely used in the area of Ambient Assisted Living (AAL), the seamless use of *smart* technology in a patient's surrounding environment to proactively monitor, predict, and over time, respond to human actions (e.g. in an assisted elderly care facility). When WBAN is introduced in this context, it gives rise to newer integration challenges including the need for WBAN transmission to be more *context-aware and intelligent* in sensing human movements and in interacting actively with the patient.

SOCIAL BARRIERS

Aside from and in addition to the technology challenges discussed above, there are several challenges pertaining to social barriers that have been discussed in research literature. Key themes in this regard are discussed next.

Trust and End-User Inexperience

Hughes et al. (2012) cite trust and lack of end user experience as complementary factors that may be limit WBAN's wider adoption. The typical end-user demographic of WBANs tends to be the aged population, who might generally lack the knowledge and experience in the use of such technology leading to mistrust. This, coupled with a single sub-optimal encounter with it might increase their resistance to adopting this technology.

Ease-of-Use

Usability features or lack-thereof, play a critical role in WBAN's adoption, due to the fact that sensors are affixed either on the human body, or *in-vivo*. The sensor nodes must be unobtrusive and be comfortable for long-term use. Since sensors can be placed in different parts of the body, both Hughes et al. (2012) and Lai et al. (2013) emphasize the need for sensor designers to balance the number of nodes with wearabilitya characteristics. Lai et al. (2013) further underscore potential health hazards inherent in long-term sensor use such as exposure to radio radiation and increase in thermal temperature around areas where nodes are placed. Yilmaz et al. (2010) recommend as a partial solution to this problem, a strategic combination of both wired and wireless technologies based on physiological vital signs being monitored.

Ethical Challenges

A unique dilemma researchers are faced with is the use of human subjects in clinical trials of sensor technology. A robust clinical trial and research phase should include testing the implantable nodes across a wide array of human subjects to establish the technology's viability. At the same time, researchers need to adhere to strict requirement as established by the Institutional Review Board (IRB). While several tests can be conducted in a simulated environment, recreating intricacies of human body motion and physiological reactions can be tricky and difficult in a simulated environment. In the context of using sensor technologies for monitoring high-risk infant's movements, Marcroft et al. (2014) discuss the fragility and size of infants involved, who often with serious brain injuries. Such situations create a socio-technological barrier that needs to be overcome.

Training

Healthcare staff and clinicians need to be trained in effectively administering sensor nodes on patients as well as in monitoring and reacting to real-time data obtained from WBANs. Marcroft et al. (2014) emphasize the need for assessors to be acutely sensitive to interpreting and evaluating vital signs and limb movements of pre-term infants since motor movements of one-to-three month infants tend to show limited variability. Since WBAN security is of paramount importance, healthcare staff need to be trained in both the technological and administrative aspects of securing the end-to-end WBAN infrastructure.

Cost

It is interesting to note that none of the research papers have highlighted the cost of WBANs as a primary adoption barrier. However, Yilmaz et al. (2010) compare the relative cost of wired vs. wireless technologies for 'on-body' sensors. In the context of leveraging mobile phones as a ubiquitous mechanism for collecting and transmitting physiological signs, Patrick et al. (2008) cite the penalties levied by mobile phone carriers in situations where customers go over their allotted data plans as a possible factor that could limit adoption.

CONCLUSION

The goal of this paper was to survey the key obstacles to the widespread adoption of the WBAN technology. From a research standpoint, this study has highlighted gaps that need to be closed with respect to technology interoperability and end-to-end integration in the complex healthcare ecosystem. Secondly, the scarcity of research papers is evident from the number of relevant research papers that could be obtained, underlining the need for more research and research publications to achieve a finer balance between QoS requirements and usability characteristics. Thirdly, further advancements in simulation software are needed to compensate for the lack of or limited availability of human subjects in the trial phases of WBAN technology.

From a practitioner's standpoint, the major takeaway is the untapped potential in commercializing the various WBAN research project's findings and prototypes. It is clear that WBAN technology is still in the nascent stages of the typical Product lifecycle, with immense potential to positively impact healthcare delivery in years to come. There is an urgent need to couple mature end-user experience with technology standardization across the vendor base, to lead to fiscally sound investments which will contribute to delivering healthcare at a reduced cost.

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BIG DATA MANAGEMENT IN UNITED STATES HOSPITALS: BENEFITS AND BARRIERS

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ABSTRACT

Big Data has been considered as an effective tool to reduce healthcare costs by eliminating adverse events and reducing readmissions in hospitals. The purpose of this study was to examine the emergence of Big Data in the United Sates healthcare industry, to evaluate hospital's ability to effectively make use of complex information, and to predict the potential benefits hospitals might realize if they are successful. The findings of the research suggest that there were a number of benefits expected by hospitals when using Big Data analytics, including cost savings and business intelligence. In addition, hospitals have recognized that there have been challenges including lack of experience and cost of developing the analytics. Many hospitals will need to invest the expense of acquiring adequate personnel with experience in Big Data analytics and data integration. The findings of this study suggest that the adoption, implementation, and utilization of Big Data technology will have a profound positive impact among healthcare providers.

Key Words: Analytics, Big Data, Business Intelligence, Costs, Data Warehouse, Health Information Management

INTRODUCTION

The widespread adoption of Electronic Health Records (EHRs) has emerged, in large part, as a result of the Healthcare Information Technology for Economic and Clinical Health (HITECH) Act, which was enacted in 2009 and gave incentives to hospital and physician providers who adopted the new technology (HealthIT.gov, 2014). In just a few years, these EHRs have collected large amounts of patients' personal health information, and simultaneously, many hospitals have either already begun, or have goals, to connect with outside health-information exchanges giving them access to receive and transmit unprecedented amounts of healthcare data (Groves, Kayyali, Knott, & Van Kuiken, 2013). Some hospitals and many industry analysts have concluded that if all of the healthcare data being collected could be manipulated and studied, there could be many benefits to be gained, for example cost containment might be possible by evaluating high-risk patients' behavior and providing some early interventions that might curtail the worsening of their condition (Brigham and Woman's Hospital, 2014). The activity that involves amassing and rapidly analyzing large amounts of different kinds of data is known as working with Big Data (Cognizant, 2012).

Working with Big Data has not been without many obstacles, and the early adopters in the healthcare sector have learned that working with Big Data is very difficult (Frost & Sullivan, 2012). The authors reported that sheer size of the data sets overwhelms most standard computer and software programs. With the advent of applications for smart phones and other hand-held medical devices that patients can use to check their medical condition and then transmit results to their hospital, the data storage requirements will need to be measured by petabytes (Halamka, 2014). A petabyte is 1,000 terabytes (one trillion bytes) of data, which is more than four times all the information contained in the United States (US) Library of Congress (McKenna, 2013). Another factor that makes working with Big Data an arduous task has been the lack of data standards (Cognizant, 2012). Despite the fact that most hospitals

have been working in the electronic realm in billing services for an even longer time than they have with EHRs, the billing data has lacked consistency across different payers, and therefore has not been very useful (Frost & Sullivan, 2012). Beyond the physical space needed to store Big Data, there have been difficulties in allocating the appropriate levels of capital and human resources needed to transform so much raw data into meaningful information (Halamka, 2014). And finally, an important real barrier to Big Data analytic adoption has been legal, which include laws that were designed to protect a patient's privacy (Roski, Bo-Linn, & Andrews, 2014).

Because the U.S. spends far more on healthcare than the rest of the world for similar, or some cases poorer outcomes, and most notably in 2009, the healthcare costs represented almost 18% of the gross domestic product, the ability to lower healthcare costs has been a major incentive for hospitals to invest in Big Data (Groves et al., 2013). These scholars also reported with new payment systems being introduced into the healthcare market, such as population health management and patient centered medical homes, both of which, put the hospitals at risk for not only lowering costs, but improving outcomes, Big Data healthcare analytics have been looked to as necessary information in order for hospitals to be successful. Using Big Data, hospitals hope to be able to predict the patients' outcomes and can tailor the care that certain patients receive if it is believed that they will do poorly without additional intervention, and in doing so, the hospital could prevent unnecessary readmissions, adverse events, or other delays in getting well (Brigham and Women's Hospital, 2014).

The purpose of this research project was to examine the emergence of Big Data in the U.S. healthcare industry, to evaluate hospitals' ability to effectively make use of complex information, and to predict the potential benefits hospitals might realize if they are successful.

METHODOLGY

The methodology for this research was a literature review with a semi-structured interview with an expert in Healthcare Information Technology (HIT).

The hypothesis of this study was that hospitals utilizing Big Data will have an increase in efficiency, efficacy and increased cost savings. The research approach followed the steps and research framework utilized by Yao, Chu, & Li. (2010) (Figure 1). This framework has been effectively applied in preceding studies, increasing its internal validity (Coustasse, Tomblin and Slack, 2013; Porterfield, Engelbert and Coustasse, 2014).

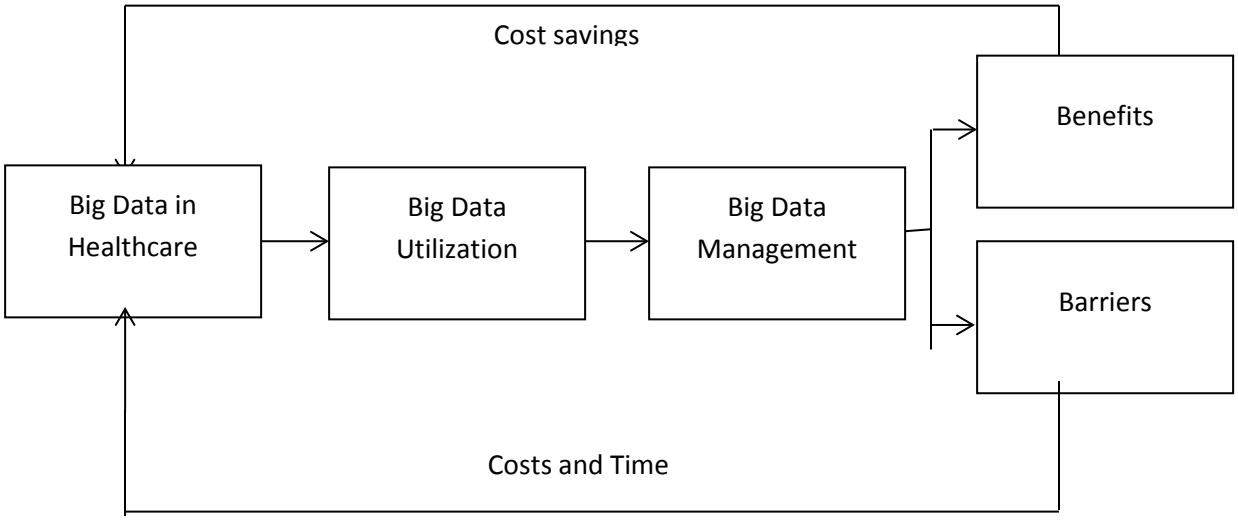

Figure 1: Research Framework (Yao, Chu & Li, 2010)

Figure 1 shows the major steps of Big Data utilization and cost savings in a healthcare institution and the barriers to impeding its implementation. The application of this conceptual framework with this study was considered suitable. For example, it starts with identifying the major benefit of harnessing Big Data, which is cost savings, and then the framework highlights the barriers of cost and time needed to work with Big Data (Figure 1).

The key phrases "Big Data" OR "Business Intelligence" OR "Data Warehouses" AND "Healthcare Information Management" OR " Data Mining" OR "Health Information Exchange" AND "analytics" OR "analysis" OR "healthcare" OR "health" OR "clinical" OR "review" OR "benefits" OR "barriers" OR "costs" OR "outcomes" as inclusion criteria to explore scholarly databases for articles. The following databases were used for this research: PubMed, ProQuest, Medline, EBSCO host, Academic Search Premier, Science Direct, SpringerLink, Google Scholar and Google. Information from various websites was included, such as, National Institute of Health, Centers for Medicare and Medicaid, Center for Diseases Control and Prevention, HealthIT.gov, Intel Corporation, Robert Wood Johnson Foundation, McKinsey Global Institute, Brigham and Woman's Hospital.

Literature was selected for review on the basis of relevance to the study, governmental regulations, and barriers and benefits to using Big Data. In an attempt to stay current, references utilized were limited to those written in English and published between 2009 and 2014. Only primary and secondary data collected from reports, articles, research studies and reviews were included in this research. References were analyzed and established to have satisfied the inclusion criteria if the material yielded accurate knowledge regarding Big Data, with special consideration on its management, benefits and barriers. A total of 68 sources were reviewed. Only 25 references to date were utilized in this literature review. The literature search was conducted by CS, AH, LB, and validated by AC who acted as a second reader and also confirmed if references met the research study inclusion criteria.

The semi-structured interview of D.L., Cabell Huntington Hospital's Chief Informational Officer, with a long experience in healthcare informatics, was used to learn about the process of developing data warehouses, the potential barriers in working with Big Data and the expected benefits (Appendix A). This interview was digitally recorded, and only relevant and pertinent answers were used to support the information found in the literature review to provide a contextualized and more comprehensive overview of this emerging technology and its utilization by U.S. hospitals.

RESULTS

The Emergence of Big Data

Many authors have identified three attributes of Big Data: volume, variety, and velocity (Jee & Kim, 2013; Moore, Eyestone, and Coddington, 2013; Raghupathi & Raghupathi, 2014). The first, attribute, volume, was characterized as the sheer size of the data sets, and would be measured in terabytes or petabytes (Sarasohn-Khan, 2014). The existence of Big Data in healthcare has emerged as a by-product of providing services to patients and includes documentation in physician and nursing notes, diagnostic imaging studies, laboratory test results, treatment documentation, pharmacy records, and billing information (Raghupathi & Raghupathi, 2014). The sources and formats of data continue to grow in variety and complexity. Manyika et al. (2011) reported that beyond the physician and hospital collected data, additional information has come from the internet; social media; mobile devices; government records and databases; and traditional offline documents scanned by optical character recognition into electronic form. The introduction of hand-held devices with sensors has expanded the capacity to collect data from individuals in their own homes (Manyika et al., 2011). The second attribute, variety, refers to the wide range of types of data that are captured, for example, much of the data is structured in a manner that would allow it to be queried by data identifiers; where as much of the data is free-text contained in notes that would require manipulation before it could be co-mingled with the structured and semi-structured data sets (see Table 1 Jee & Kim, 2013). The third attribute, velocity, refers not only to the rate at which the data is being collected and stored; but also velocity also refers to the necessary speed of the data analytics to be effective, which has been said to be as close to real-time as possible (Moore et al., 2013; Nash, 2013; Wills, 2014).

Barriers to Hospital's Use of Big Data

A review of the literature found a number of barriers that might prevent or slow hospitals in the development of Big Data and the related analytics. Many researchers have found that the time and costs associated

with the integration of the data from various information systems has been a major challenge in developing a Big Data warehouse (Jee & Kim, 2013; Shapiro, Mostashari, Hripcsak, Soulakis, and Kuperman, 2011; Northover, 2014; Raghupathi, & Raghupathi, 2014; Wills, 2014; Chute et al., 2013). Another concern has been the issues surrounding security of the data, compliance, and patient privacy issues, and many researchers have thought that regulatory and policy changes will need to be addressed to promote adoption (Bates, Saria, Ohno-Machado, Shah, and Escobar 2014; Jee & Kim, 2013; Northover, 2014; Raghupathi & Raghupathi, 2014). Many of the researchers have cited lack of expertise in Big Data analytics as a hurdle to hospitals, which will be important since having all of the data gathered in a warehouse without the ability to analyze it properly would not accomplish any benefit (Table 1). A complete list of challenges associated with Big Data identified by the researchers were compiled and included in Table 1.

Table 1: Challenges for Hospitals in Using Big Data Analytics

Challenges	Details (Citation)
Cost and difficulty of connecting disparate systems to data warehouse	• Lack of standardization of data sets is costly (Raghupathi, & Raghupathi, 2014). • Sheer volume of data and lack of connectivity of systems makes it costly (Wills, 2014). • Complexity of extracting data from a large variety of sources in different formats (Chute, 2013). • Integration costs (Jee and Kim, 2013). • Cost of developing interfaces (Shapiro, 2011). • Data standardization and interoperability between numerous IT systems (Northover, 2014).
Lack of information systems and analytical professionals with experience	• New leadership is needed, Chief Analytical Officer (CAO) (Nash, 2014). • Lack of information technology big data talent in healthcare (Northover, 2014). • Ability to find big data analytic talent (Jee and Kim, 2013). • Lack of competency of healthcare staff in using analytics (Skiba, 2014).
Concerns over data quality and quality assurance practices	• Data quality will be important to be validated before predictive analytics are applied (Northover, 2014). • Quality assurance will be a difficulty ongoing task (Raghupathi, & Raghupathi, 2014). • Predictive modeling might have harmful effects if patients are treated differently based on a flawed data model (Wills, 2014). • Data must be extremely current or not going to be helpful in analytics (Moore, 2013).
Security and privacy	• Security and privacy concerns (Northover, 2014; Raghupathi & Raghupathi, 2014). • HIPAA and other regulatory restrictions need to be modified with new policies (Bates, 2014). • Data security and compliance programs (Jee and Kim, 2013).
Financial motivations	• Current payer systems still mostly fee for service will need to continue to shift to motivate hospitals (Bates, 2014).

Potential Benefits to Hospital Using Big Data Analytics

Based on the review of the literature, there were some common benefits cited for hospitals if they are successfully able to use Big Data analytics. The most common benefit found was the reduction of healthcare costs, which might be achieved in many different ways, including: reducing readmissions, eliminating unnecessary tests, diagnosing patients earlier when interventions are more successful, and effectively managing patients who are at

high risk for complications or those who utilize services frequently; these strategies are often associated with population health (see Table 2). Other benefits included improving health care outcomes and using Big Data for business intelligence leading to better operational decisions (see Table 2).

Table 2: Benefits of Using Big Data Analytics

Benefits	Details (Citation)
Reduce costs of healthcare delivery	• Tracking high-cost patients, lower readmissions, reduce adverse events, treatment optimization (Bates, 2014). • $200,000 USD in monthly savings experienced by University of Michigan Health System in providing blood transfusions using big data analytics (Raghupathi, & Raghupathi, 2014). • Reduction of healthcare costs by predictive modeling (Wills, 2014). • Reduce healthcare spending (Jee and Kim, 2013). • Lower readmissions (Stempniak, 2014). • Lower costs through better patient interventions (Northover, 2014). • $7 billion USD in total estimated savings by 2,700 Premier member hospitals after using Big Data analytics to analyze supply chain costs (IBM, 2013).
Reduce costs of research and development	• Analytical tools could lessen time for research study by predicting which patients that would most likely comply with studies (Jee and Kim, 2013). • Reduce development costs for pharmaceutical companies (Chute, 2014).
Improve health care outcomes	• Better detection and earlier detection of medical conditions (Jee and Kim, 2013). • Being able to use analytics to intervene with patients that will benefit most (Skiba, 2014). • Anticipate patient needs and provide tools for population health (Moore, 2013). • Analytics to support population health strategies (Shapiro, 2011). • Increase quality of care (Nash, 2014).
Business Intelligence	• Using data to make better operational decisions at hospitals (Stempniak, 2014). • Improve hospital's collections (Moore, 2013). • Provide for automated means for better quality reporting (Shapiro, 2011). • Improve patient engagement with predictive analytics (Nash, 2014).
Expand patients access to care	• E-health, mobile health tools that transmit data to hospitals from patients' home (Nash, 2014).

Hospital Case Study: Cabell Huntington Hospital's Experience with Big Data Warehousing and Analytics

Cabell Huntington Hospital (CHH) is a 313-bed acute care hospital serving patients in West Virginia, eastern Kentucky, and southern Ohio. CHH has had a close working relationship with the School of Medicine at Marshall University (Marshall). About a year ago, CHH's CEO and the Dean of the medical school determined that developing a data warehouse with analytic tools would be made a priority. For one payer, CHH and Marshall had been responsible for managing the costs of providing all health care to a certain group of patients. The insurance company had been requesting proof of lowered costs as well as other quality outcome measures. Without the data analytics, Marshall and CHH had not been able to appropriately respond to the insurance company (D.L, 2014).

According to D.L., the first step in the process of developing a Big Data solution was forming an Informatics Technology Governance Committee made up of CHH's CIO, Marshall's CIO, and the Chief Medical Information Officer, a physician who is involved with this project, and some key financial executives in the hospital.

After doing some research, the group concluded that there were basically two approaches that could be undertaken: the first, would involve building a data warehouse from scratch with all of the analytics to be added using some commercial software; the second, would involve buying a pre-packaged data warehouse and analytic solution all in one. CHH and Marshall decided to choose the first option. The main reason was the perceived cost of building versus buying. In 2014, an estimate of the cost for the pre-packaged solution was projected to be $1 million (D.L., 2014).

One of CHH/Marshall's biggest challenges has been that they do not have any organizational knowledge of working with Big Data analytics. D.L. admitted that they do not have the skill set, expertise, and other experience, because they have never worked in this new sector before; so they are on a learning curve. The first thing that the team had to do was to hire a data architect who would have the responsibility to build the data warehouse. CHH also hired two data analysts to work on the day-to-day duties. So far, the staff members have been in the process of evaluating all of the different data sources, building the data dictionaries, doing some normalization of data, so that they can start pulling data into one place and do some analytical reporting.

As far as the potential benefits to be realized by developing the Big Data analytics, the CIO, envisioned two focus areas. The first area would be internally-focused benefits, such as improving internal operations, efficiencies, working denials, and improving quality and safety issues; the second area would be externally-focused benefits, such as population health, understanding where the patients go throughout the entire healthcare spectrum – not just the hospital or physician's office. Performing the analytics, could result in preventing readmissions, excessive or unneeded care, or more drugs (D.L, 2014).

DISCUSSION

The purpose of this research project was to examine the emergence of Big Data in the U.S. healthcare industry; to evaluate hospitals' ability to effectively make use of complex information, and to predict the potential benefits hospitals might realize if they are successful.

The findings of this study suggest that the adoption, implementation, and utilization of Big Data technology may have a profound positive impact among healthcare providers. Cost containment, cost savings, and better patient outcomes through more successful disease management are among the principal benefits to be expected. Kaiser Permanente Health Connect® is an EHR that has improved the management of disease among cardiovascular disease patients, as well as yielding Kaiser Permanente an approximate savings of $1 billion (Groves, et al., 2013). Utilizing demographic characteristics, previous diagnoses, and various information collected from EHRs, enables healthcare organizations to predict costs for individual patients, which may be used by insurers and providers (Loginov, Marlow, & Potruch, 2012).

The results suggests that adoption and utilization of Big Data technology have increased in recent years, making a significant impact in reducing costs in the delivery of care at the patient level. For instance, Raghupathi & Raghupathi (2014) found that blood transfusion costs were reduced by $200,000 USD per month just at one health system by the use of Big Data analytics. Brought about, in part, by the HITECH bill encouraging providers to adopt EHRs, the gathering, synthesizing, and practical use of Big Data is expected to continue. However, the results also suggested that adoption of Big Data analytics has been implemented relatively slowly due to numerous barriers, such as security and privacy concerns, lack of connectivity between disparate HIT systems, and a shortage of experienced health care informatics personnel. Therefore, it can be surmised that many health care organizations will be working to overcome many of these barriers in order to survive in a new era of health care which is focused on health care value and the efficient delivery services. Overall the results suggest that hospitals utilizing Big Data technology have had an increase in efficiency, efficacy, and increased cost savings.

Many hospitals and health systems will need to invest the expense of acquiring adequate hardware and software with the capability to accommodate the volume of data for their expected future HIT needs. Because the integration of linking data from numerous systems can be challenging, many providers will need to factor in a considerable amount of planning in order to appropriately estimate the amount of capital and staff required to implement a sufficient strategy to harness Big Data technology. Providers have to put forth the cost of ensuring that relevant members of their workforce are adequately trained in HIT, in order to effectively use of the new HIT

systems. Hospital planners will need to develop pro forma statements that strive to predict the costs savings that might be realized by preventing unnecessary readmissions, and eliminating unneeded tests.

Healthcare providers also have a duty to design their organizations' HIT systems to assure that patient privacy is safe guarded, and must take action to meet the legal obligation to conform to any privacy laws. It is incumbent upon the leadership of a healthcare organization to pave the way toward implementing a system to accommodate its Big Data technology needs in order to affect the desired increase in efficiency, efficacy, and cost savings.

STUDY LIMITATION

The literature review may be limited by: the quality and number of databases accessed, and the search strategy utilized. Also, the consideration of developing technology for the purpose of harnessing Big Data is a relatively new concept; therefore, there was a limited amount of quality research available on the quantitative benefits of Big Data, which restricted the researchers' ability to conduct a thorough analysis. Researcher publication bias cannot be ruled out due to research evaluation to determine articles study relevancy.

CONCLUSION

Harnessing Big Data technology is an effective solution for reducing healthcare costs, reducing adverse events and readmissions. Until recently, it has been found that the Big Data technology has been too expensive, and it has been very time consuming to implement. However, as the cost savings are realized, hospitals will invest more into developing Big Data analytics.

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APPENDIX A

Questions Asked in Semi-Structured Interview of Mr. Dennis Lee, Chief Information Officer at Cabell Huntington Hospital in Huntington, West Virginia on September 19, 2014.

1. As a Chief Information Officer, what has been your experience working with Big Data generated in the hospital environment?

2. What efforts have been undertaken to develop data warehouses at Cabell Huntington Hospital and/or Marshall Health? Why?
3. How would you develop a realistic estimate of the resources (personnel, hardware, storage, software, time, etc.) required to capture and analyze Big Data generated by a 313-bed academic medical center's operations, such as Cabell?
4. In your experience, what have been the main challenges with working with Big Data? Why?
5. What do you believe are the likely benefits that might be realized if the data could be effectively managed and mined?
6. Do you believe that the pay-off of successfully obtaining Big Data analytics will be worth the investments? Why or Why not?
7. What do you believe is going to be the first area(s) that the healthcare market will see Big Data applications being employed? Why?
8. How far in the future do you predict these applications will occur?
9. What advice would you give hospitals that are in early planning stages of developing a data warehouse and tools for Big Data analytics? Why?

EVALUATION OF GLUCOSE MONITORING TECHNOLOGIES FOR COST EFFECTIVE AND QUALITY CONTROL/MANAGEMENT OF DIABETES

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ABSTRACT

The diabetes epidemic in the United States (U.S.) has become a burden in regards to treatment, disease management, and associated costs. Key advancements in medical technology have been developed in efforts to mitigate this issue. We compare several types of glucose monitoring systems with respect to quality of care, management, and cost-effectiveness for type 1 and type 2 diabetics.

INTRODUCTION

Diabetes is a disease of metabolism: a disorder of how the body processes food. Most of the food eaten is transformed into glucose, which enters into the bloodstream, where cells use it as an energy source. Insulin, a pancreatic hormone, is required for the absorption of glucose into cells. Normally, when people consume nutrients, the pancreas produces the appropriate amount of insulin necessary for glucose to be absorbed from the blood stream into the cells. In individuals with diabetes, the pancreas produces either no or insufficient insulin, or the body's cells do not process the insulin which is produced properly. As a result the body loses its fuel source.

Two major types of diabetes exist: type 1 diabetes (formerly referred to as juvenile diabetes) and type 2 diabetes (formerly referred to as adult onset diabetes). Patients with type 1 diabetes account for about 5-10% of diagnosed diabetics in the U.S.; this condition occurs mostly in children and young adults but can become manifest at any age (ADA", 2012). It occurs because the body's immune system attacks and destroys the insulin-producing cells in the pancreas. If not diagnosed and treated with insulin, an individual with type 1 diabetes can lapse into a life-threatening coma.

About 90-95% of diabetics have type 2 diabetes, which is often associated with physical inactivity, older age, previous history of gestational diabetes, a family history of diabetes, obesity, and certain ethnicities. In 2010, type 2 diabetes was diagnosed in more than 25.8 million adults over the age of 20 in the U.S., while another 7.1 million went undiagnosed; 81.5 million had prediabetes (Roger et al., 2011). The prevalence of type 2 diabetes in all age, gender and ethnic groups in the U.S. is expected to more than double (from a prevalence of 5.6% to a prevalence of 12%) between 2005 and 2050 (Narayan et al., 2006).

Type 2 diabetes is increasingly being diagnosed in children and adolescent (Copeland et al., 2005; "Healthy Ohio", 2014. Patients with type 2 diabetes usually produce normal amounts of insulin, but this insulin is not used properly by the body and eventually a decrease in insulin production results. This results in the same situation as in the case of type 1 diabetes: blood glucose increases and the body cannot efficiently use of its main source of fuel ("Glucose", 2015).

Diabetes is associated with multiple long-term complications affecting virtually all parts of the body. The disease often leads to blindness, heart and blood vessel disease, stroke, kidney failure, amputations, and nerve damage (ADA, 2010). Before the discovery of insulin, a diagnosis of type 1 diabetes was a virtual death sentence – all patients died within a few years after diagnosis (Sattley, 2015). Insulin, while not a cure, was the first major breakthrough in the treatment of diabetes.

Treatments for type 1 diabetes include healthy eating, physical activity, and taking insulin; basic treatment for type 2 diabetes are the same as for type 1, except that oral medication may be substituted for insulin ("About Health", 2015). Blood glucose levels should be closely monitored through frequent blood glucose checking; patients with diabetes should also monitor blood glucose levels several times a year with a laboratory test called the HbA1c, results of which reflect average blood glucose levels over a 2-3 month period. This entire monitoring procedure has been characterized by many diabetics as complex (Kouris et al., 2010). The goal of diabetes management is to keep levels of blood glucose as close to the normal range as safely possible ("Goals of Treatment", 2015).

Diabetes was the 7th leading cause of mortality in the U.S. in 2007, with a reported 71, 382 death certificates listing it as the underlying cause of death. Actual contribution of diabetes to death is likely much more substantial, as an additional 160,022 death certificates in 2007 include diabetes as included under any-listed cause of death (ADA, 2011).

In 2012, the total expenditure for U.S. diabetes care was $245 billion, $176 billion for direct medical costs and $69 billion in productivity reduction (ADA, 2014). Between 1988-1994 and 2011-2012, the prevalence of diabetes increased in the overall U.S. population and in all subgroups evaluated, although the prevalence did appear to stabilize between 2007-2008 and 2011-2012 (Menke et al., 2015).

TECHNOLOOGY

Technological advancements in medicine have been developed in an effort to mitigate the diabetes epidemic in the U.S. Self-monitoring of blood glucose provides useful information for the management of diabetes. It can help the patient understand how well he/she is accomplishing treatment goals; how diet, exercise and other factors (e.g., illness, diabetes medication) affect blood glucose; and identify when blood glucose is too high or low (Mayo Clinic, 2015).

Traditional Blood Glucose Testing

Traditionally, the most common way (Vashist et al., 2011) to check blood sugar levels has been for the patient to: (1) prick the finger with a small, sharp needle; (2) transfer the drop of blood to a test strip; (3) place the test strip into a glucose meter; and (4) read the blood glucose level displayed on the meter. This self-monitoring approach is an "integral component of effective therapy" (ADA, 2015, S33). Although these Self-Monitoring Blood Glucose (SMBG) devices are generally simple to use, many patients often do not fully adhere to their provider's monitoring regimen. Lack of adherence is generally due to the inconvenience of testing multiple times daily, the cost of monitoring supplies, and the pain associated with multiple finger pricking (D'Archangelo, 2009). While the glucose meter itself is relatively inexpensive ($40 is not unusual), test strips for SMBG can cost up to $100 per month ("Guidelines", 2015). Globally, sales of blood-glucose monitors peaked in 2011 and has declined since then (Wall, 2013), but this is not sufficient to conclude that the business is souring since the majority of sales do not come from the blood glucose monitors but from the blood glucose strips themselves (Lund, 2014). The SMBG market was estimated at $3.99 billion for 2013 and is projected to grow to $4.18 billion by 2016 (Frost & Sullivan, 2015).

Continuous Glucose Monitoring

A technological advance in the field of glucose monitoring has been the development of Continuous Glucose Monitoring (CGMS) systems. CGMS include a tiny sensor that is surgically inserted under a diabetic's skin and used to monitor glucose levels. This sensor can stay in place for up to one week. Glucose levels are transmitted via radio waves to a wireless monitor (NIDDK, 2015). Unlike conventional SMBG monitoring, CGMS devices have the ability to more easily identify trends and fluctuations regarding direction, duration, magnitude, and frequencies in blood glucose levels that are difficult to monitor effectively using traditional glucose monitoring methods (Klonoff, 2005).

CONTINUOUS GGLUCOSE MONITORING CLINICAL RESULTS

Benefits of Continuous Glucose Monitoring in Diabetes Treatment: Studies of Type 1 Diabetes

Continuous glucose monitoring (hemoglobin level) can be associated with improved glycemic control in adults with type 1 diabetes (Tamborlane et al., 2008). Hirsch et al. (2008) demonstrated that type 1 diabetics with greater sensor utilization showed a greater improvement in A1C levels, but reduction in HgA1c was not significantly different between test (CGM) and control (SMBG) groups.

CGM technology has increased that capability to accurately recognize hypoglycemia and hyperglycemia in type 1 patients. CGM has offered sensitivities that have reached over 80% for threshold alerts alone, which had improved to well over 90% when combined with predictive alerts (Mastrototaro, Welsh and Lee, 2010). CGM has been shown to be associated with decreased HbA1c levels and time spent in hypoglycemia in individuals with type 1 diabetes (Battelino et al., 2012). Peyrot and Rubin (2009) reported that in a survey administered to 162 patients using a CGM device and 149 patients using SMBG to monitor blood glucose levels, found that the patients using CGM were more satisfied with their treatment and had better quality of life. The ADA found that CGM can be extremely useful in patients greater than the age of 25, due to evidence that CGM results were weaker on children and young adults (Steck et al., 2014).

Wojciechowski et al. (2011), in a review of 14 randomized clinical trials of the use of CGM for type 1 diabetes, found that CGM, particularly its real‐time system, had a favorable effect on blood glucose control and decreased the incidence of hypoglycemic episodes in both adult and pediatric patients.

Benefits of Continuous Glucose Monitoring in Diabetes Treatment: Studies of Type 2 Diabetes

Historically, patients with type 2 diabetes, particularly patients on diet or oral medications, test blood glucose levels much less frequently than patients with type 1 diabetes (Joyce and Pick, 2013). The Harman-Boehm study (2008) described multiple indications for the use of CGM among those patients with type 2 diabetes:

- to determine when and for how long patients have low, normal or high blood glucose
- to map fluctuations-direction, magnitude, duration, frequency, causes
- to facilitate adjustments in treatment to optimize control
- to determine response to adjustments in therapy.
- to determine the impact of lifestyle modification on control.
- to determine the impact of diet composition on control
- to diagnose and avoid hypoglycemia

CGM has many advantages to patients with type 2 diabetes. Harman-Boehm (2008), suggested that CGM provided an answer for some of the insufficiencies attributed to SMBG (e.g., CGM has the ability to detect postprandial glucose excursions, and nocturnal hyperglycemia not easily detected by SMBG). In a study in 2012, it was found that quality of life using the CGM, showed scores mainly unchanged for both the treatment and the control group, however, fear of hypoglycemia was reported in the study to be lower by 7.4% while wearing CGM (Mauras et al., 2012).

Patients with type 2 diabetes using CGM on an intermittent basis of 3 days a month for 3 months showed significant decreases in calorie consumption from total calories per day of 1858 calories to 1690 calories, an increase in exercise time from 188.2 minutes per week to 346.6 minutes per week and a decrease in the HbA1c levels from 9.1% to 8.0% (Yoo et al., 2008). The patients in this study also demonstrated decreased total daily calorie intake, weight, body mass index (BMI), and postprandial glucose level, and a significant increase in total exercise time per week after 3 months.

Allen et al. (2008) demonstrated a positive correlation between educating patients with type 2 diabetes on the impact of their physical activity on their glucose results using the data from the CGM device and the patients' increase in moderate activity by 5 minutes a day and also showed a statistically significant decrease in HbA1c.

When evaluating the use of CGM in a small sample (n=10) of poorly controlled type 2 diabetics, patients showed a mean reduction of 20% in HbA1c at the end of the first 90 days of monitoring, with an additional 1% reduction achieved to an average of 7.72% among those participants who continued to use CGM (Thielen et al., 2010). Cosson et al. (2009-0k) found a statistically significant decline in the HbA1c of type 2 diabetics using CGM

compared with controls in a self-monitoring control group. No significant reduction in HgA1c was found for type 1 diabetics.
Vigersky et al. (2012) in a randomized controlled trial of 100 type 2 diabetics, found significant reduction of HgA1c after 12 weeks with results persisting after 40 weeks. A 52-week study (Ehrhardt et al., 2011) found that RT-CGM improved glycemic control better than self-monitoring of blood glucose (SMBG) in patients with type 2 diabetes who were not taking prandial insulin.

Barriers to Continuous Glucose Monitoring Implementation

Some disadvantages that were reported included the complex task of inserting and calibrating the sensor, troubleshooting device malfunctions, and responding to alarms that became a burden that reduced the benefits from the technology (Wolpert, 2010).

The use of CGM requires the insertion of sensors under the skin, and many patients experience pain and/or discomfort from the sensor, transmitter, or tapes which are used to secure the device to the body. Also, the user was tasked with reading the CGM data once an alarm sounded and often, patients were not taught how to interpret and use the data, which cause patients to be dissatisfied with their results (Mastrototaro, Welsh and Lee, 2010).

Reimbursements for CGM devices have been limited by insurance or government payers. Insurance companies have been demanding rigorous evidence about continuous monitoring before they would pay for this technology (Klonoff, 2005). Usually, the sensors that have been used for CGM struggled to provide an accurate measurement of blood glucose; the devices had to be calibrated to the patient's blood glucose level by finger pricking, the more traditional method (Heinemann, 2006).

Cost-Effectiveness of Continuous Glucose Monitoring for Type 1 and Type 2 Diabetes

A cost effectiveness and resource allocation empirical study determined the cost-effectiveness of CGMS compared to SMBG and insulin therapy in type 1 diabetic adults, concluding that patients using CGMS achieved an expected improvement in effectiveness of 0.52 QALYs at an expected increase in cost of $23,552, resulting in an ICER of approximately $45,033/QALY. Based upon a willingness-to-pay of $100,000/QALY, CGM with intensive insulin therapy was deemed to be cost effective (McQueen et al., 2011). The CGMS combination also reduced the likelihood of disease progression, co-morbid complications, and mortality in subjects via its effect on HbA1c levels in comparison to SMBG (McQueen et al., 2011). Using the same willingness-to-pay hurdle, Huang et al. (2010) also reached the same conclusion for type 1 diabetics, although these researchers did note considerable uncertainty surrounding these estimates. Lifetime projections indicated that CGMS would lead to reductions in complications such as blindness, amputation, and kidney disease.

Research has indicated cost-effective results in type 2 diabetes patients as well. Vigersky et al. (2012) analyzed the short and long-term effects of CGMS in type 2 diabetic subjects not on prandial insulin, concluding that type 2 diabetic patients not taking prandial insulin had significant improvement in glycemic monitoring using CGMS (Vigersky et al., 2012). A base-case analysis projected the costs at five years using the same intervention that was used by Vigersky et al. (2012). Mosley et al. (2012) estimated that improved glycemic control from CGMS was projected to reduce average costs with the following complications: heart disease (-$177), kidney disease (-$141), and diabetic food complications (-$212), and that the overall cost/QALY was $10,071.

DISCUSSION

The analysis of the literature displays a need for CGM among patients with type 1 and type 2 diabetes. CGM is a viable treatment option that serves to assist in data collection for lifestyle adjustments and treatment adjustments.

Clinically, in multiple studies, CGM has been shown to be effective in reducing blood glucose and HgA1c. The studies suggest an improvement in lifestyle in terms of nutrition, exercise and glucose control. This shows that the individual's awareness of how their choices impact their glucose states which contributes to the willingness to accept the lifestyle modifications needed. Identifying the causes of blood glucose changes in a real-time environment using CGM contributes to greater confidence among those with type 2 diabetes when compared to

SBG monitoring. This confidence allows for the user to confidently adjust their medication doses with much less fear of a hypoglycemic event (Joyce and Pick, 2013).

Despite evidence that CGM has the potential to benefit patients with type 1 and type 2 diabetes, widespread adoption of this technology has been limited. In patients with frequent hypoglycemic incidents, the quality of life benefits that were provided by continuous monitoring were offset by disadvantages.

CGMS technologies are able to detect critically low overnight blood glucose levels, reveal blood glucose change levels between meal consumptions, display early morning spikes in blood glucose, and evaluate how an individual's caloric intake and physical activity affect blood glucose levels (Vashist, 2013). They offer the potential to predict hypoglycemic events before their occurrence (D'Archangelo, 2009) and are compact, wearable, light-weight, portable, possess long sensor life spans, and are water-resistant (Vashist, 2013). CGMS are especially useful in intensive care units, where close monitoring of blood glucose is especially important (Vashist, 2013).

If further research continues to suggest that the use of CGM is a viable measure to battle the diabetes epidemic in the U.S., stakeholders of the health system need to ensure that the general population has affordable access to and the means to education on this clinical technology. Improvements in the ability to use CGM information appropriately, joined with improvements in the design of devices and their reliability will continue to help with diabetes management.

However, most commercially-available CGMS require training and education of the diabetic patient, and frequent fingerstick blood tests for calibration. They are also relatively expensive. Until these problems have been addressed, it is that CGMS devices will replace SMGB systems on a widespread basis (Vashist, 2013). According to WebMD ("How Does", 2015), new and improved types of CGMS are currently in clinical trials.

CONCLUSION

CGMS has been shown to be an effective and cost-effective option in terms of efficient treatment and disease management for type 1 and type 2 diabetic subjects. Further improvement in the design and reliability of CGMS technologies will enhance the management of diabetes.

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ABSTRACT

Nationwide Health Information Network (NHIN) use in healthcare facilities was examined for utilization and efficacy, although the advantages are abundant, healthcare facilities have been reluctant to adopt it due to associated costs. The purpose of this study was to analyze the feasibility of a U.S NHIN by exploring and determining the benefits of and assessing the barriers to its implementation. The results of this study suggest that implementation and utilization of NHIN by healthcare industry stakeholders leads to an increased quality of patient care, increased patient-provider communication, and cost savings opportunities. Increased quality of care is achieved by reducing adverse drug events and medical errors. Cost savings opportunities are generated by a reduction in spending and prices that is attributable to electronic health record systems' increased efficiency and effectiveness.

Key Words: Nationwide Health Information Network, benefits, barriers to implementation

INTRODUCTION

Technology has skyrocketed and grown over the last decade, with an increase of its use also comes the potential of fraud and abuse of technology. In addition, laws such as the Health Insurance Portability and Accountability Act (HIPAA) were passed in 1996 to protect confidentiality information of individuals' private files in healthcare (Office of Mental Health, 2012). HIPAA works closely with the Nationwide Health Information Network (NHIN) and protects confidential information being transmitted over the internet (ONCHIT, n.d.a). In addition, surprisingly the United States (U.S.) is not the first to develop NHIN. France is one of the many that are the forerunners in developing a national HIE (Grady, 2012). France implemented the Dossier Medical Personnel for use in 2011 and many challenges arose, but according to this author, the U.S. could learn from the mistakes to help develop the full widespread use of NHIN (Grady, 2012).

NHIN was developed under the Office of the National Coordinator for Health Information Technology and was adopted in 2004 (ONCHIT, n.d.b). Files are secured electronically and safely instead of the old fashioned way of paper information. This process has allowed information to be readily available and transmitted to the right people which, in turn, increases process flow and leading to overall better quality of care for the patient when records are immediately available (ONCHIT, 2013).

NHIN has been used by various organizations which makes it feasible to exchange pertinent information between these organizations including: organizations that use Electronic Health Records (EHR), personal health records, health information exchanges, and government departments like public health departments and so forth use the NHIN (USDHHS, 2010). In spite of the benefits that NHIN has provided, many healthcare providers have

remained reluctant about committing to implementation and maintenance of such a technology given the high costs and effort associated with establishing NHIN standards (Dixon, Zafar, & Overhage, 2010).

Multiple features come together to build NHIN. These features include NHIN Exchange, Direct Project and also Connect (Dimick, 2010). NHIN Exchange is the first initial startup of the NHIN and implemented the policies, standards, and specification that interlinked federal agencies like Centers for Disease Control and Prevention (CDC), Centers for Medicare and Medicaid Services (CMS), Department of Defense (DoD) and many more (Bouhaddou et al, 2012). As of 2012, NHIN Exchange had 30,000 clinical users, 65 million people involved, 1 million records have been shared, with an estimated 3,000 providers (Sullivan, 2012). NHIN Direct Project was created so that health organizations and government agencies like DOD,CDC, and CMS can send authenticated and encrypted health information to known trusted individuals (ONCHIT, 2014). As of 2010, more than 200 participants and over 50 different organizations contributed with Direct Project (ONCHIT, 2014). NHIN Connect uses the Social Security Department to securely connect hospitals and government organizations with the Data Use and Reciprocal Support Agreement also connect has allowed health information to be exchanged in a healthcare organization which from there can connect to a Regional Health Information Network (RHIO) (Enrado, 2011). RHIO is a type of health exchange organization which includes stakeholders within a certain area and governs Health Information Exchange (HIE) for the purpose of improving quality care (USDHHS, 2012). With components like Exchange, Direct Project, and Connect the NHIN is able to form a stronger interoperability relationship between patients and providers at a private but quality standard (USDHHS, 2012).

Healthcare providers, health plans, and organizations that exchange information within a state have been referred to as RHIO (Vest & Gamm, 2010). RHIO interlinks with HIE which has greater synchronization of care and has allowed patient and physician portals, patients health personal records, health insurance, and information exchange to interlinks with HIE (Vest & Gamm, 2010). The HIT for Economic and Clinical Health's main goal was to have more EHR and hospitals by 2019 connecting physicians, hospitals, and patients through the internet. The investment of $19.2 billion in 2009 has been to encourage hospitals to use HIT. This allotment has allowed the creation of infrastructure towards HIT (ALN Medical Management, 2010).

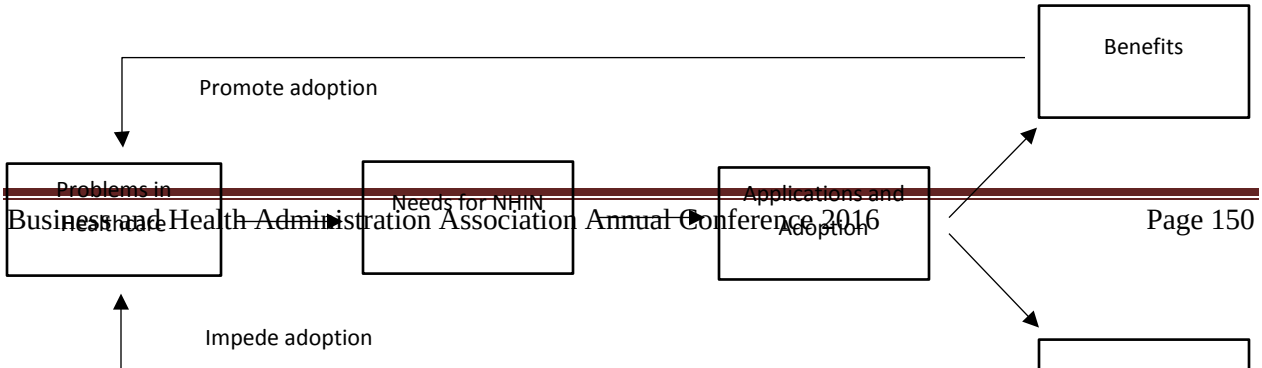
The main purpose of this study was to analyze the feasibility of a U.S NHIN by exploring and determining the benefits of and assessing the barriers to its implementation.

METHODOLOGY

The primary hypothesis of this study was: hospitals that commit to implementing and actively managing NHIN standards, services, and policies will experience increased quality of care, better communication, and lower costs. The research methodology applied in examining the implementation of NHIN in the U.S. followed the basic guidelines of a systematic literature review partnered with a semi-structured interview of JM, the Chief Information Officer at Carroll Hospital Center, a private, nonprofit, 193-bed hospital located in Westminster, MD (see Appendix A). This interview was tape-recorded, and only appropriate answers were used to support findings from the literature search to offer an example in practice and a more complete outline of this technology and its utilization in the hospital setting.

The research approach and conceptual framework found in this study followed those implemented by Yao, Chu, & Li (2010). The current study's use of this conceptual framework is appropriate because its original application was to explore how an adopting an emerging technology could enrich the healthcare delivery system. The circular process is similar to any project development method; it defines a problem and determines a need before preparing and implementing a solution. In this study, the solution is the utilization of NHIN in a variety of health care settings. After the adoption of NHIN standards, services, and policies, the benefits and barriers are assessed which permits the process to restart to address barriers and evaluate benefits (see Figure 1).

Figure 1: Conceptual Framework



The literature review was separated into three stages: (1) Literature Recognition and Compilation; (2) Literature Analysis and Evaluation; and (3) Literature Categorization.

Stage 1: Literature Recognition and Compilation

The search of literature was conducted using the search engines and academic databases accessible through Marshall University Libraries. Databases that were used to explore literature included Academic Search Premier, LexisNexis, ProQuest, PubMed, SpringerLink and Google Scholar. In the search, the keywords 'Nationwide Health Information Network' or 'NHIN' were combined with the terms 'cost' or 'quality of care' or 'benefits' or 'privacy' or 'barriers' as inclusion criteria. Journal articles and other scholarly press written in English and from sources within the U.S. regarding NHIN adoption were pinpointed. Given the shortage of scientifically peer-reviewed publications concerning the subject matter of the current study, articles from well-respected newspapers and magazines were referenced to supplement the academic literature.

Stage 2: Literature Analysis and Evaluation

Literature was chosen for review on the basis of benefits and barriers to the utilization of NHIN by healthcare providers. The search queries were narrowed to include articles published between 2003 and 2014 to keep it a current review. Only primary and secondary data from literature written in the U.S. were included in this review. The primary step in establishing the relevancy of literature to the current study was to review the abstract of each respective article. If the material offered accurate information concerning the utilization of NHIN by healthcare providers with an emphasis on benefits and barriers, the articles were determined to have satisfied the inclusion criteria. The literature search was performed by TG, CG, and JV and validated by AC who acted as a second reader and also verified that references met inclusion criteria. From a total of 62 initial results, 44 sources were considered suitable for use in the current study.

Stage 3: Literature Categorization

Those articles that were found to be relevant were then categorized using the adopted conceptual framework. The findings of the literature review are shown in the following sections of the results using the classifications of benefits and advantages of, as well as barriers to, NHIN adoption by healthcare providers.

RESULTS

Benefits and Advantages of NHIN

Increased Quality of Care

In 2013, 210,000 Americans died from preventable hospital errors, making it the third-leading cause of death in the U.S. (James, 2013). The most common and deadly medical errors are mistakes that take place with prescribing medication (Carter, 2012). The ability to electronically write and transmit prescription in the ambulatory setting is now mainstream and becoming the standard of care (Hillblom, Schueth, Robertson, Topor, & Low, 2014). In 2006, e-prescribing, the ability to electronically send an accurate, error-free and understandable prescription directly to a pharmacy from the point of care, was made available through HIE (CMS, 2014). Adverse Drug Events (ADE) affect nearly five percent of hospitalized patients, making them one of the most common types of medical errors (Boxer, 2013). HIE has greatly reduced the frequency of ADEs from known allergic reactions, by finding prior allergies that the patient may not have remembered, and improving the accuracy of the allergy list (Kaelber & Bates, 2007).

In 2014, a study on the enhanced checklists and electronic dashboards of an EMR system decreasing medical errors was published. Central line-associated blood stream infections among children rates dropped from 2.6 per 1,000 line days to 0.7 per 1,000 line days with the use of the EMR system (Pageler et al., 2014). With an implemented NHIN, physicians can easily access patient medical records to check any current medications patients are on, probe for any allergies and/or adverse drug interactions as well as review past visits to provider and examine medical test results (Crane & Crane, 2008). The fast and ubiquitous access to patient records and other medical information provided by the NHIN could reduce the number of medical errors due to inadequate information regarding a patient's history, prescribed medication, and current condition (Felder, Alwan, & Zhang, 2008).

Increased Communication

Patients play such a large role in determining both the need for care and the outcomes of care. There is a growing mindfulness that patients should be more participatory in successfully managing their own health and healthcare (Greene & Hibbard, 2012). According to Houston, Sands, Jenckes and Ford (2004), 82% of patients who used electronic based communication through NHIN stated that the experience as satisfying. More than 40% of these patients even answered they would be willing to pay a fee-per-email. The study also revealed that 95% of patients said email was more efficient than a telephone call and 40% stated it was a less intimidating forum to ask questions (Houston et al., 2004). NHIN has allowed the physician and patient to have more time to talk amongst another since the physician no longer has to contact various personnel to receive lab or test results and have more face-to-face time with patients (O'Malley, Cohen, & Grossman, 2010). The HIE, which is conducted through NHIN, has allowed patients and physicians to share information on an electronic chart such as test results. Patients who view their medical information regularly are more collaborative not only improving the patient-physician communication but relationship as well (White & Danis, 2013). Patients who are more engaged in their health have been more active participants in the therapeutic alliance collaboratively who manage their health with clinicians to improve factors such as pain reduction, functional outcomes, and medication adherence (Tang, Ash, Bates, Overhage, & Sands, 2006).

Cost Savings

Implementation of a NHIN using various EHR systems in primary care can result in a positive financial return on investment (ROI) to the healthcare organization. (Wang et al., 2003). In 2003, Wang et al. estimated cost savings of $86,400 per provider over a period of 5 years by using an EHR. Physicians who use commercially available EHR systems have been saving of $5.14 per patient per month (Information Management Journal, 2013).

Alder-Milstein et al. (2013) described a University of Michigan study that analyzed the impact of EHRs in community-based settings, including private practices and hospitals. Throughout the study researchers collected data from insurance agencies from the years 2005-2009 revealing that outpatient spending did not rise as fast in communities that had adopted an EHR system. Also, the findings of this study resulted in a three percent savings that could substantially increase if focus was pinpointed within the healthcare organization (Alder-Milstein et al., 2013). In 2008, Bar-Dayan et al. showed a 4.1% price decline, in overall expense, among specialty physicians who used an EHR system. The system made referral transfers more efficient, delivering needed information easier between primary care physicians and specialty physicians. EHR, used within the NHIN, can facilitate effective utilization of healthcare providers and decrease costs (Bar-Dayan et al., 2013).

BARRIERS TO NHIN ADOPTION

By interviewing 18 executives at 10 different healthcare organizations, Dobalian et al. (2012) found that concerns have been raised about the additional financial resources required for NHIN during a time when cost-cutting is a main focus of the healthcare industry. Areas of apprehension included setup costs of new infrastructure needed, alteration costs of existing technology to be eligible for participation, training costs to educate workforce on using the new technology, and hiring costs to handle the increased workload necessary for operation (Dobalian et al., 2012). The interviews also found that healthcare executives were worried about patient privacy and the misuse of data. These concerns were attributable to: (1) the confidentiality of patient information, especially in vulnerable populations, such as those with HIV, psychological disorders, or celebrity status; (2) HIPAA compliance and

burdening legal departments with an even larger workload; (3) unauthorized use of patient data for public health; and (4) increased risk of data breach. It was determined that apprehensions existed among the interviewed healthcare executives concerning the interoperability of NHIN; inhibited data translation due to organizations' varying definitions and infrastructure requirements for data transmission and retrieval to outside parties were the main issues voiced (Dobalian et al., 2012).

Uncertain Costs Associated with Implementation

Kaushal et al. (2005) estimated that achieving NHIN required an initial capital investment of $156 billion over the course of 5 years, equal to 2% of total healthcare spending over that same time span. Two-thirds of this initial investment was for establishing functionalities such as EHRs, CPOE, and electronic prescriptions, among others. The remaining one-third of the initial investment was needed for establishing interoperability. In addition to this preliminary investment, $48 billion in cost was anticipated annually for continual operation (Kaushal et al., 2005). A 2007 study presented by Pan, Cusack, Hook, and Middleton estimated the cost of the initial deployment of HIE across NHIN to be $97 million. An additional $41 million in cost was estimated for annual maintenance-related costs (Pan et al., 2007).

In a 2009 survey of 131 RHIOs conducted by Alder-Milstein, Bates, & Jha, it was reported that an average of 25 months was required for operational RHIOs to reach a level where operating costs were covered by revenues generated from entities participating in data exchange. Only 41% of operational RHIOs reported the ability to cover operating costs with revenue generated from entities participating in data exchange. Of the operational RHIO respondents that were unable to operate at a level where costs were covered by revenues at the time of the survey, only 28% reported that they eventually expected to reach that level (Alder-Milstein et al., 2009). The main barrier to the development of RHIOs among survey respondents was a lack of funding; over 80% of planning RHIOs and nearly 60% of operational RHIOs indicated this as an important barrier. Of the 131 survey respondents, 34 RHIOs reported pursuing clinical data exchange in the past but were no longer pursuing it as of June 2008, equaling a RHIO failure rate of 20% (Alder-Milstein et al., 2009).

Patient Privacy and the Misuse of Data

HIPAA, the legal epicenter of the public and professional attention in the health care industry, prohibits health care entities and their employees from disclosing any health-related information about a patient without authorization from the patient or their medical power of attorney; additional data security systems are needed to protect this sensitive patient information while stiff legal and financial ramifications, along with a sullied public image, await violators of HIPAA (Hollar, 2009). Another legal aspect of the electronic exchange of Protected Health Information (PHI) within the U.S. is the Family Educational Rights and Privacy Act (FERPA), which states that a child's parent or legal guardian must authorize the release of the child's school records to any agency or individual that requests them, if the child is under 18 years of age. The child's school records oftentimes contain PHI pertaining to cognitive development and immunization records (Hollar, 2009). FERPA overrides HIPAA and requires EHR networks like RHIOs and NHIN to obtain the consent of parents and guardians of children under the age of 18, compounding the already-troubling issue of obtaining the consent of all individuals age 18 and older for exchanging PHI electronically (Hollar, 2009).

Rosenbaum, Borzi, Repasch, Burke, and Benevelli (2005) provided insight into rights and legal issues surrounding the electronic exchange of PHI, including the ownership of health information, disclosure of PHI, access to PHI by governmental agencies, and basic research access to patient records. An agreement was reached that HIPAA was designed to prevent patient confidentiality and discrimination abuse, though certain conflicts exist with HIPAA overruling states' efforts to safeguard PHI (Rosenbaum et al., 2005). The ownership of a patient EHRs has remained a major unresolved issue among patients, hospitals, insurance companies, and other shareholders in the U.S. health care industry (Rosenbaum et al., 2005).

Interoperability

While the importance of NHIN is widely recognized in the U.S., the storage of patient data has remained divided on which of the following two data storage architectures should be utilized: (1) the distributed or institution-centric model, where patient data is stored where it is created and inputted; or (2) the centralized or patient-centric model, where patient data is stored in one central location for a given patient (Lapsia, Lamb, & Yasnoff, 2012). In simulation studies aimed to analyze data availability, data integrity, and data retrieval failure rates for each of the architectures listed above, the distributed model fared poorly in data availability, integrity, and retrieval failure rates when compared with the centralized model of patient data storage architecture (Lapsia et al., 2012). The choice of patient data storage architecture impacted the efficiency, usability, and effectiveness of NHIN at the point of care, given that both architectures studied are popular models utilized within the U.S. healthcare industry (Lapsia et al., 2012).

According to JM, the interviewed hospital information technology executive, NHIN implementation has faced challenges in maintaining interoperability. A characteristic of the U.S. healthcare industry is the non-standard language used in health information technology. The lack of a structured nomenclature for data in healthcare has inhibited the ability of organizations to effectively and efficiently exchange information across a nationwide network. Inconsistencies also exist among documentation included in a patient's EHR, where physicians provide a telling and lengthy narrative about the care provided to the patient and other healthcare personnel use shorthand notes in order to work as efficiently as possible. The inconsistencies in documentation techniques make it difficult on developers of architecture for NHIN because it is difficult to recognize text to include in a universal, recognizable language used in the exchange of a patient's PHI (James, 2005).

DISCUSSION

The purpose of this study was to examine and analyze the feasibility of a U.S. NHIN by exploring and determining the benefits of and assessing the barriers to its implementation. The results of the literature review have suggested that NHIN has had a positive effect on the U.S. health systems. The possibilities of advanced HIT are consistently growing, thus enhancing quality of care with factors such as interoperability and compatibilities between systems, therefore making it much easier to transmit imperative information through state and federal systems. The literature review supports the feasibility of the U.S. NHIN as well as significant savings for hospitals and providers. NHIN assures progress in accessing patient information and being able to transmit necessary information into the hands that need it. In fact, with the capabilities and progressiveness that NHIN has shown; NHIN allows patients to be able to go to different providers and have their medical information follow them without paper medical records which is pertinent to not alone patient but their providers.

From the literature review conducted the implementation of a NHIN would increase the quality of care by providers. NHIN permits HIE, which includes E-prescribing. E-prescribing has the ability to electronically send prescriptions rather than physicians having to hand write them. Medical errors will significantly reduce with the use of this system. The legibility of hand written prescriptions have been obstacles in the clinical field and often result in prescribing incorrect dosage and or drugs to patients. This hindrance is eliminated when prescriptions are electronically typed in and transferred. E-prescribing detects errors and contain alerts to make sure the right drug and dosages have been distributed which in return increases the quality of care. Along with E-prescribing HIE contains EHRs that contain patients medical history. Having access to a patients' medical history is very influential in the quality care that is given by the provider. Patients have easily forgotten received treatments and conditions they have previously had. The history that is offered by HIE help physicians in making decisions for the patients' treatment because they do not have to rely on their patients' memory.

Increased communication was also identified as a benefit from the literature review. The patient-physician relationship is important and communication is key. Communication is enhanced by NHIN with the HIE's e-mail messaging system between patient and providers. The results stated that 40% of patients stated that e-mail communication was a less intimidating way to communicate. If patients are comfortable with their physician communication is more likely to occur, and in a result physicians are more likely to treat, and appropriately. Along with the e-mail system, HIE offers access to test results for patients. Patients who have had access to test results are more concerned with their health. The access to such information gives initiative for patients to ask their physicians about their results and any other health concerns that may stem.

From the literature review, study has shown that there is significant savings in costs associated with the implementation of NHIN. The feasibility of NHIN has a noteworthy amount of cost savings of $86,400 in ROI over 5 years with the implementation of EHR within NHIN. The rate of outpatient spending has also decelerated with a 3% savings. This study suggests that NHIN is vital to hospital savings relative to costs.

The number of patient to physician ratio continues to escalate, physicians that have patients information already can open the door for other ways of communication amongst patients and physicians. NHIN can allow greater communication possibilities for advancement within HIT. For example, telehealth allows patients to see physicians online 24 hours of the day from their computer (i.e.. American Well). With NHIN's capabilities, it could be possible in the near future to allow those physicians to have access to the patients records. In return, quality of care more is more efficient and effective. In addition, physicians can actually see what problems the patient has had in the past. This would allow physicians chances of diagnosing the problem correctly at a much faster rate than if a physician didn't know anything about a patient while decreasing costs on both ends.

As it was learned one size does not fit all especially when it comes to interoperability. In the early stages of NHIN, variances in states that have larger HIE's have taken on new characteristics. This has helped lead the way for solid groundwork with identity proofing/ authentication, addressing and secure routing for the states that are lower in the chain that may not be able to acquire for themselves without getting in the way of other HIE projects involving DoD, CDC, CMS, and others (McCloskey, 2010).

NHIN provides an abundance of advantages, the concept of everyone adapting is more challenging. In addition, some physicians do not like participating in Meaningful Use because it requires change and it is very costly and hard to meet (Kibbe, 2010). Meaningful Use is an incentive for physicians to show that physicians are using EHR efficiently and effectively. In fact NHIN Direct is easy to subscribe to and transmit important data. With NHIN, Meaningful Use criteria has allowed or is allowing data exchange to support care coordination, patient interaction/engagement, and submission of quality data to meet and lower costs (Kibbe, 2010).

This research study could be limited by the search strategy undertaken, the quantity of databases searched, and publication bias, which may have constrained the articles that were used in this study. Researcher bias may also have been an issue given that articles were searched for and evaluated by the researchers to establish their relevancy to this study. Published research on NHIN implementation is limited given that it is still in the developmental and trial stages across the U.S.

NHIN can grow substantially to be the cornerstone of HIE across the U.S. for all participants within the healthcare industry. It can produce cost savings opportunities, increase the quality of care that is being delivered to patients, and increase communication among patients, providers, and other industry stakeholders. Given that NHIN is still an emerging HIE technology that has gained momentum and support in the 2000s, further research is needed to assess the impact that NHIN will have on the healthcare industry, with a focus on providers and patients. A comparison of the effectiveness and efficiency of NHIN methods and frameworks provided by governmental organizations in the U.S. would progress the implementation and utilization of this new HIE technology by providing a standard for all to follow.

CONCLUSION

The findings of this study have suggested that the utilization of NHIN has the capability to generate opportunities for cost savings after investment for implementation, increase in quality of patient care, and increase in patient-provider communication. Nevertheless, barriers to NHIN implementation and utilization still remain throughout the healthcare industry, the main one being concerns about interoperability.

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TRACK
HEALTHCARE MANAGEMENT

ELICITING SEXUAL HISTORY: TESTING IS THE KEY TO PREVENTION BUT PROVIDERS CONTINUE TO BALK

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ABSTRACT

More than 1.2 million persons are living with human immunodeficiency virus (HIV) in the US with over 58,000 cases predicted each year since 2006 (Chibbaro, 2007, CDC, 2015). The best method to prevent the spread of HIV is to test, provide treatment for those infected thereby reducing the risk of transmission to a sexual partner, and PrEP (CDC, 2016) to prevent infection for those known at risk. Sexual history taking and the counseling structured from that information is a critical element in HIV prevention education but there is still reluctance by primary providers to ask essential questions. Reasons are explored.

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IMPLICATIONS OF THE AFFORDABLE CARE ACT FOR FREE CLINICS: EFFECTS ON DONORS, PATIENT VOLUME, AND VOLUNTEERS

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ABSTRACT

This paper will report on the preliminary findings of a national survey given to free and charitable health care clinics across the country. The particular focus will include a reporting of the effects of the Patient Protection and Affordable Care Act (PPACA) on patient volume, donations, and volunteerism from the perspective of those running these institutions. Surveys completed by the staff and leadership of health care clinics were collected from the summer of 2015 to the present. The perceived effects of the PPACA by clinic staff may reveal an ongoing necessity for free and charitable clinics to provide care for people despite the passing and implementation of the ACA.

This provides background context for the central focus of this paper, which is the impact of the PPACA, (commonly known as "Obamacare"), had on the demand for various types of health services, the number of volunteers, and value of cash donations. For example, we will present data from a sample of 473 clinics to reveal that while the need for some services has decreased, there has been an increase in demand for other services. Implications for how health care administrators and business leaders in health care can utilize this information will be discussed, along with how these reported findings may affect the perceived success of the PPACA.

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SMALL CLINIC ELECTRONIC HEALTH RECORDS IMPLEMENTATIONS: AN OPTIONS THINKING VIEW

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ABSTRACT

The rapid evolution of electronic health records (EHR) in recent years has made it difficult for small medical and dental practices to remain competitive. While research has shown that offices who use EHR receive more insurance reimbursements for enhanced coding techniques, how decision makers choose the appropriate implementation is still elusive for many practices. By using strategies from real options, research suggests that decision-makers in offices can make better-informed decisions by examining real options. However, real options have never been evaluated in relation to implementation choices governed federal regulations. To examine this gap in the literature, we addressed EHR software implementations using real options theory to determine if these options will better serve decision makers.

In an effort to improve patient care and help providers make better decisions about treatments, federal laws that govern the way Medicare and Medicaid reimbursements are processed have been enacted (Jones, Rudin, et al. 2014). These mandates require that all providers who are eligible to receive Medicare and Medicaid payments acquire federally compliant software. These mandates are necessary to avoid being penalized by a progressively increasing reduction in reimbursement rates.

In this paper, we adopted Myers' view of real options thinking, and we apply Fichman's point of view as it relates to IT investment decision making (Myers 1977, Fichman, Keil, et al. 2005). This framework allowed us to study how decision makers in practices can view the choices available when implementing EHR software. Therefore, we addressed the following research question, "how do real options thinking lead to different EHR implementation decisions in small physician practices?" The research was conducted using a qualitative multi-case study of three small practices. Study results identified how small practice decision makers can utilize real options theory to understand better what options are available to them when purchasing and implementing EHR systems. Real options can also be a helpful tool in assisting a small practice in evaluating EHR systems overall fit within the practice and the system's overall ability to meet specific practice needs.

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MANAGING MULTI-GENERATIONAL WORKGROUPS IN HEALTHCARE; BOTH IN CLINICAL AND ADMINISTRATIVE ROLES

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ABSTRACT

Working in groups is inevitable in healthcare and historically it has provided an opportunity to exchange knowledge based on experience. That was when age was equated with wisdom. Now, with as many as four generations working in one place (Vanek, 2013), conflict arises between individuals who are comfortable with the status-quo, those who embrace change, and those who are in the middle ground. Hendricks and Cope, (2013) identify communication, commitment, and compensation as three values that vary widely in the generational diversity and should not be dismissed when attempting to ease the tension in group work. Although, conflict can equate to creative solutions.

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PUBLIC HEALTH AND PRIMARY CARE: EXPANDING THE ROLE

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PUBLIC HEALTH AND PRIMARY CARE: EXPANDING THE ROLE

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ABSTRACT

The demand for primary care services in the United States is currently not being fully me. Ageing and demographic changes indicate the gap between demand and supply will continue to widen. Provisions within the Affordable Care Act will attempt to increase the supply of primary care physicians. Sadly, past experience does not inspire us with confidence that these efforts will work. Public health departments are often ignored in terms of the role that they play in providing primary care. This paper identifies the need for additional primary care services and outlines a proposal to allow public health entities help satisfy this need.

INTRODUCTION

A clear argument can be made that the essence of public health is a collective exercise to create environments where people can be healthy (Tilson & Berkowitz, 2006). The nature of what it means to be healthy has been changing. The greatest challenges to health are now chronic diseases: cardiovascular disease, cancer, hypertension, asthma, and diabetes (Mayes & Armistead, 2013). Within the developed countries chronic diseases consume the largest percentage of health care expenditures (Schroeder, 2007). In the United States this problem is even greater as chronic diseases account for 75% of our health care expenditures (Centers for Disease Control and Prevention, 2009). If we accept the premise that the essence of public health is to keep people healthy, then the inclusion of public health into primary care becomes logical. It also becomes evident, and economically necessary, that primary care focus more on reducing the impact of chronic diseases.

An almost constant refrain is that the United States is spending too much money on health care. The current estimate is that we are spending almost 20% of our Gross Domestic Product for health care and this could rise to 25% by 2025 (Congressional Budget Office, 2011). Based upon the current cots of chronic diseases and the projections of future costs, the control of health care spending will require significant reductions in the impact of chronic diseases. Here is where we believe a greater focus on primary care can produce very meaningful results. Public health should provide a much greater role in this reduction.

Assessment of Primary Care Services

The United States health delivery system is complex due to the nature of the ideals of healthcare that exist within the population. The United States lacks a single national entity or set of policies guiding the health care system; physicians and hospitals practicing in the same community and caring for the same patients are not connected to each other (Doctors for America, 2015). It should be of note that when the health reform initiatives were originally initiated, there were issues of declining health insurance and also increasing cost for the care within the United States. However, "a third crisis also has captured the attention of policy makers; the decline of primary

care." (Bodenheimer, 2010). The Starfield pillars of primary care identified four features of primary care services: first-contact access for each need; long-term person- (not disease) focused care; comprehensive care for most health needs; and coordinated care when it must be sought elsewhere (Bodenheimer, 2010). The Institute of Medicine's definition of primary care is consistent with ensuring that integrated, accessible health care services are provided and that there are clinicians who are accountable for addressing a large majority of personal health care needs (Institute of Medicine [IOM], 2010). In 2010, research by the Agency for Healthcare Research and Quality (AHRQ) noted that the number of practicing primary care physicians in the United States was approximately 209,000 (Agency for Healthcare Research and Quality [AHRQ], 2010). More recent data from the Kaiser Family Foundation's State Health Facts reports that as of June 2015 notes that the number of totally active primary care physicians in the United States is 430,150 (Kaiser Family Foundation [KFF], 2015). California has the highest number of active primary care physicians with 49,112, followed by New York (35,569) and Texas (27,859). The other top 10 states where the most primary care physicians are practicing in the United States are identified in Table 1.

In terms of populations of patients within the United States, there is a wide variety of differences among communities. The needs for services vary depending on whether the community is rural or urban. Only about 11 percent of the nation's physicians work in rural areas, despite nearly 20 percent of Americans living there (National Conference of State Legislators [NCSL], 2012). Primary Care will be challenged to address the needs of all populations, which are transforming the services and partnerships of the past. According to The John's Hopkins Primary Care Policy Center, "Primary Health services" are defined as (1) health services related to family medicine, internal medicine, pediatrics, obstetrics, or gynecology, (2) diagnostic laboratory and radiologic services, (3) preventative health services, (4) emergency medical services and (5) pharmaceutical services. In reality, not all services are provided as robustly as others within different segments of our communities. There are traditional facilities where primary care services are offered in the United States that include single practices, group practices, managed care organizations, public health facilities and corporations. Today, there are also emerging, non-traditional facilities, including emergency departments, specialty care centers, school wellness areas and workplace wellness centers. Whether traditional or non-traditional, issue of access, quality and cost still are essential components to address, along with how to keep facilities in compliance, utilize additional practitioners and adapt to changes in health care for sustainability.

Table 1: Top 10 States with the highest number of Primary Care Physicians

STATE	Primary Care Physicians
California	49,112
New York	35,569
Texas	27,859
Florida	24,609
Pennsylvania	21,167
Illinois	19,480
Ohio	17,466
Michigan	16,257
Massachusetts	14,005
New Jersey	13,294

Models of Care

There are new models of care that are gaining interest in the United States. Some practices can now become certified Patient Centered Medical Homes (PCMH). Other models of care are also being considered to improve outcomes and focus on collaborative health care. The new programs and services must be unique to the area rather than just transitioning urban focused programs to rural communities. With the ACA, the problem is expected to get bigger as more people are being driven into the healthcare system. Unfortunately, few communities have the funding, facilities or the number of providers to accommodate their additional needs. Options for providing additional care through existing rural providers include, expanding services to nurse practitioners (NP's), Physician Assistant's (PA's), Pharmacists and other non-physician health professionals currently engaged with patients to improve the outcomes within their impacted communities. PCMH models allow patients to be engaged with a team

of healthcare professionals, including their provider in order to begin the process of transforming health care to a more integrated approach that is appropriate and includes access to community resources when there is a need.

The Integrated Health Model (IHM) is another option of inclusive use of physician and non-physician professionals. Some of the IHM features are designed to incorporate more specific health needs, such as Mental Health and Behavioral Health. In seeking to integrate care through these new models, the outcomes are improved and the cost of care becomes less when access is more readily available.'

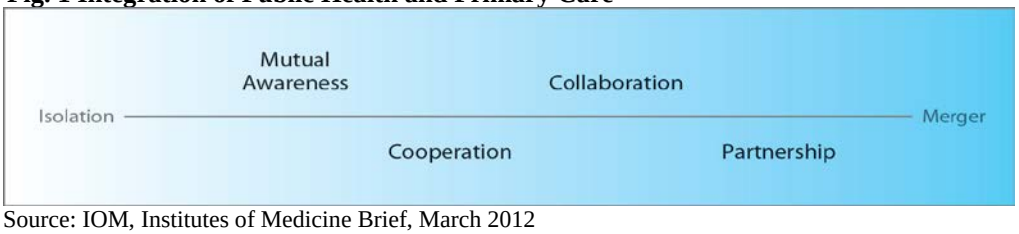
According to Healthy People 2020, access to healthcare is important for (1) overall physical, social, and mental health status, (2) prevention of disease, (3) detection and treatment of illness, (4) quality of life, (5) preventable death and (6) life expectancy.

Future of Primary Care

Public Health and Primary Care are aligned in their goals but have historically worked as independent entities. In an effort to provide care that is based on equity, the complexities of cost, quality and access to care continues to remain critically important in determining how to ensure that health delivery become exemplary for all. The next decade should be aligned with moving toward an integrated system instead of factions between public health and primary care. In rural communities, access to primary care is essential in providing for physical, social and mental health services, prevention of disease, detection and treatment of illnesses, quality of life, preventable death and life expectancy. There are significant gaps within the rural health care system. The most common gaps are cost, quality and access.

Although public health and primary care are focused on similar goals in providing care and services, they have typically operated as their own independent entities. In considering where there are opportunities to make changes that will better align the two; there are many factors that are important. In many instances, gaps exist for rural communities that do not occur in urban areas. There is a new challenge for public health as it strives to meet the needs of populations of patients but individualize the approach toward ensuring optimized cost, quality and access to health needs. Gaps that are perceived and realized remain to be cost, quality and access to care. Access is the most likely to be impacted significantly impacted in rural areas. Based on the 2012 Institutes of Medicine's (IOMs) Brief on Primary Care and Public Health: Exploring Integration to Improve Population Health, new opportunities are emerging to bring these two areas together. However, it will not be a short- term simple fix; rather there will be various phases of change due to differences between communities based on needs, social climate and expertise. Additionally, local, state and federal agencies have been tasked with continuing to make strides toward partnerships between primary care and public health. It is well understood that mutual awareness may be considered a big accomplishment in some communities, while cooperation and collaboration will be huge milestones in other communities. Figure 1 identifies the manner in which integration will take place if it is to happen between public health and primary care.

Fig. 1 Integration of Public Health and Primary Care



Source: IOM, Institutes of Medicine Brief, March 2012

The Role of Local Public Health Departments in the Delivery of Primary Care Services

The 2002 report by the IOM *The Future of the Public's Health in the 21st Century*, reiterates the definition of public health as "What we as a society do collectively to assure the conditions in which people can be healthy" (IOM, 2003, p. 28). The three core areas of public health are assessment, assurance and policy development and include ten essential functions (Figure 2). The pillar of the public health system is the Local Health Department (LHD). There are approximately 2,800 LHDs in the United States (NACCHO, 2014) that are legally required to

provide the essential public health services within their communities (IOM, 2012a, p. 3). The size of the communities which LHDs serve range from populations of less than 10,000 to populations over 1,000,000 (NACCHO, 2014). Because of the varied population differences there are also multiple levels of jurisdictions that include city, metropolitan, county, and tribal units or multi-county regions or districts. In addition to these multiple jurisdictions, there are different funding schemes within the state and local governments that help finance the services provided, as well as a diverse public health workforce to provide those services. For these reasons, the scope of public health services within these communities vary tremendously from providing surveillance services to clinical services.

Figure 2: Ten Essential Public Health Services

Assessment
1. Monitor health status to identify community health problems 2. Diagnose and investigate health problems and health hazards
Policy Development
3. Inform, educate, and empower people about health issues 4. Mobilize community partnerships to identify and solve health problems 5. Develop policies and plans that support individual and community health efforts
Assurance
6. Enforce laws and regulations that protect health and ensure safety 7. Link people to needed personal health services and assure the provision of health care when otherwise unavailable 8. Assure a competent public health and personal health care workforce 9. Evaluate effectiveness, accessibility, and quality of personal and population-based health services
Serving All Functions
10. Research for new insights and innovative solutions to health problems

Source: Public Health Functions Steering Committee (1994)

The National Profile of Local Health Department Study Series (Profile Survey) is a survey conducted by the National Association of County and City Health Officials (NACCHO) for local health departments to determine the public health services that LHDs currently provide, which may include environmental services, population-level services or individual-level clinical services (primary care). This Profile Survey has been administered several times from 1989 to 2013. This study utilized the 2013 LHD Profile Survey, which had a response rate of 79% representing over 2,532 LHDs to determine the scope of primary care services provided. This survey was selected because it provides the most current representative sample of primary care services after the budget crisis from 2008 and prior to the implementation of the ACA. The primary care services were divided into four categories provided by the LHDs. These categories were immunizations, maternal and child health (MCH), chronic disease management, and other services.

The results from the 2013 Profile Survey, indicates that the most common public health services provided by LHDs are population-based. Ninety-one percent of local health departments provide communicable and infectious disease surveillance programs, 90% provide adult and child immunizations, and 83% provide Tuberculosis screenings (NACCHO, 2014). In addition, environmental health surveillance programs were provided by 78% of the LHDs (NACCHO, 2014). The primary care services provided are diverse and are dependent upon the size of the community. A larger percentage of primary care services are more common among LHDs who serve larger populations.

Although immunizations can be classified as a population-health program, it is also considered to be a primary care service and as previously mentioned, is the most common service offered by LHDs. Among the maternal and child health (MCH) services offered, 60% of LHDs of any size provided maternal and child home health care visits and 54% provided family planning services. A little more than 30% of the LHDs provided any type of clinical services such as early periodic screening, diagnosis or treatment (EPSDT) programs (36%) or well-child care clinics (32%) and even fewer offer obstetrical care (8%) (Table 2). Chronic disease management services are provided by half of the LHDs, where only 11% of all LHDs provide comprehensive care services. Among all LHDs,

high blood pressure screenings (57%) were the most commonly offered screening program and cardiovascular screening (27%) the least offered. Behavioral/mental health services and substance abuse programs were the lease likely programs to be provided across all LHDs.

Table 2: LHDs Primary Care Services Provided (%) by Population Served[a]

Services	All LHDs	<25,000	25,000-49,999	50,000-99,000	100,000-499,999	500,000+
Immunizations						
Adult Immunizations	90%	87%	92%	94%	93%	92%
Child Immunizations	90%	85%	92%	93%	92%	95%
Maternal and Child Health						
EPSDT[b]	36%	36%	37%	37%	37%	38%
Family Planning	54%	50%	55%	57%	61%	63%
MCH[c] Home Visits	60%	53%	57%	66%	68%	78%
Prenatal Care	27%	20%	27%	34%	32%	35%
Well Child Clinic	32%	29%	31%	36%	35%	33%
Obstetrical Care	8%	5%	8%	9%	14%	18%
Chronic Disease Management						
Chronic Diseases	50%	42%	48%	54%	60%	72%
Diabetes Screening	36%	35%	34%	40%	37%	42%
HBP[d] Screening	57%	62%	57%	58%	49%	50%
CVD[e] Screening	27%	23%	26%	32%	29%	39%
Cancer Screening	36%	30%	34%	42%	44%	44%
Other Services						
Comprehensive PC[f]	11%	7%	9%	16%	15%	20%
APM[g]	19%	13%	16%	21%	26%	44%
EMS[h]	3%	2%	1%	3%	5%	17%
Laboratory	27%	20%	23%	26%	38%	66%
Home Health Care	21%	28%	19%	20%	13%	10%
Behavioral or Mental	10%	7%	8%	12%	14%	28%
Substance Abuse	7%	4%	6%	9%	10%	20%

Note. [a]Data provided from the 2013 National Profile of Local Health Departments, by %. [b]EPSDT = early periodic screening, diagnosis, and treatment; [c]MCH= maternal and child health; [d]HBP = high blood pressure; [e]CVD = cardiovascular disease; [f] PC = primary care; [g]APM = asthma prevention and management; [h]EMS = emergency medical services

The IOM defines primary care services as "the provision of integrated, accessible healthcare services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of family and community" (IOM, 2012a, p. 3). The majority of clinical services or primary care services that are provided by LHDs are critical to the communities for whom they serve and are in line with this definition. Currently there is some controversy among LHD leaders as to whether clinical services is critical to the overall core functions of public health because there is a multitude of players, both public and private organizations as well as individuals, that are intertwined in the public health system whose goals are to support the three core functions of public health (IOM, 2003, p. 28). However, some LHDs regard providing primary care services as part of their mission and as an essential function, especially to the vulnerable populations in their communities, as a safety net provider if there are not any other options due to a shortage of health professionals or services (Bekemeier, Pantazis, Dunbar & Herting, 2014; Hsuan and Rodriguez, 2014). Nevertheless, there has been a decline in clinical services offered and currently only half of the LHDs still provide a range of primary care services to the uninsured and underinsured (IOM, 2012b, p. 66). The 2013 LHD Profile Survey, provides further evidence of the decreases in clinical services offered by all LHDs. Among the primary services offered, all of the screening services for diseases or conditions (diabetes, high blood pressure, cardiovascular, and cancer) saw a significant decrease from the 2005 LHD Profile Survey data (NACCHO, 2014). Specifically, diabetes screening decreased from 48% by all LHDs to 36% and cancer screenings decreased from 42% providing this service to 36% (Table 3).

Local Health Departments are facing challenges that will have an effect on providing direct primary care services. These challenges include changes in the public health workforce, continued reductions in state and local budgets, and the implementation of the Affordable Care Act (ACA). However, some LHDs are adapting to these changes by reducing their primary care services and expanding their population-based prevention services, while other LHDs will continue to support their primary care services by finding other ways to be reimbursed for the primary care services through third-party billing, or by collaborating with other healthcare providers in their communities. This may include forming an Accountable Care Organization (ACO) with other local entities or collaborating with federally qualified health centers.

Table 3: LHDs Select Screening Programs for Diseases/Conditions (by Profile Study Years 2005 and 2013)

Clinical Screening Program	2005	2013
High Blood Pressure Screening	69%	57%
Diabetes Screening	48%	36%
Cancer Screening	42%	36%
Cardiovascular Screening	34%	27%

Source: NACCHO, National Profile of Local Health Departments, 2013.

LIMITATIONS

As the National Profile of Local Health Department Survey is self-reporting, there are limitations to this survey that we must take into account when discussing the services and programs provided. First, this survey does not allow for LHDs to provide extensive details on the scope or scale of some of their services or programs. Second, this survey does not explicitly provide the definition of many of the 87 programs or services included, so the interpretation of the programs and services they provide may differ among the respondents. Third, some of the LHDs were given additional questions to answer, which may not convey the whole picture of the primary care services that are provided within all of the LHDs. However, this Profile Survey does provide very valuable information concerning the current state of local health departments and the public health services and programs that are offered.

Public Health Model

The divide between traditional medicine and public health has many roots, but probably the most significant is financial. When Medicare and Medicaid were developed to serve the elderly and the poor reimbursement was focused on treatment and not prevention. This created a basic divide between medicine and public health owing to financial incentives mainly being giving to medicine for procedures and dealing with major illness, rather than to public health and its role in prevention (Scutchfield, Michener, & Thacker, 2012).

The separation of medicine and public health was further exacerbated during the 1970's and 1980's as greater emphasis was placed on cost containment in health care. Previously reimbursed primary care services performed by public health were no longer funded (Stephens, 1990). With this departure by public health from primary care a huge deficit was produced in the offering of these services. This deficit was especially acute in many rural areas and inner-city neighborhoods in the United States. The core of the problem seemingly rests with payment and reimbursement schemes. In general, in healthcare delivery we pay to do things. We undervalue cognitive and preventative services by not paying for them. What we believe needs to be created is a system that funds both prevention and primary care services: enter public health.

The recently initiated and upheld Affordable Care Act provides a variety of funding schemes that can combine preventative services with primary care services (Scutchfield et al., 2012). A number of these projects are available through the Centers for Disease Control (CDC). Our proposed model would use this funding to create within already existing public health facilities, primary care clinics staffed primarily by nurse practitioners, pharmacists, and health educators. Where possible, the range of these public health clinics could be increased by using mobile clinics. Services that would be provided would be modeled after those offered at clinics currently housed in many retail pharmacies. Additionally, our pharmacists would be available to do Medication Therapy Management (MTM) for conditions such as asthma, diabetes, and hypertension among others. Our health educators would provide diet and exercise education, smoking cessation programs, and any other health education programs

that a specific area may need. Our goal is to provide health care services to the underserved, and to lower costs and improve outcomes. A condition that can serve as an illustration for our model is the afore mentioned asthma.

The recently initiated and upheld ACA provides a variety of funding schemes that can combine preventative services with primary care services (Scutchfield et al., 2012). A number of these projects are available through the Centers for Disease Control (CDC). Our proposed model would use this funding to create within already existing public health facilities, primary care clinics staffed primarily by nurse practitioners, pharmacists, and health educators. Where possible, the range of these public health clinics could be increased by using mobile clinics. Services that would be provided would be modeled after those offered at clinics currently housed in many retail pharmacies. Additionally, our pharmacists would be available to do Medication Therapy Management (MTM) for conditions such as asthma, diabetes, and hypertension among others. Our health educators would provide diet and exercise education, smoking cessation programs, and any other health education programs that a specific area may need. Our goal is to provide health care services to the underserved, and to lower costs and improve outcomes. A condition that can serve as an illustration for our model is the aforementioned asthma.

A study conducted to evaluate the cost of asthma revealed that for the years 2002 – 2007 the incremental direct cost was $3,259 per person per year. Additionally, the cost of days lost per year was $301 for each worker and $93 for each student. For the year 2007, the total incremental cost for the United States was $56 billion along with morbidity losses of $3.8 billion, and productivity losses of $2.1 billion (Barnett & Nurmagambetov, 2011). The tragedy of these losses is that most of them are preventable. The key elements to better asthma management are high-quality health care, patient education, and optimizing the management of asthma (Follenwelder & Lambertino, 2013). All of these elements would be addressed by our health care teams within the public health institutional settings. In addition, the adverse effects of asthma disproportionately affect blacks and the rural poor (Follenwelder & Lambertino, 2013). We suspect that this is a pattern of a variety of diseases and conditions that our model would address.

CONCLUSION

The need to reach the most disenfranchised of our citizens for their health care needs and services is clear. Much has been written and attempted and yet many basic problems still remain. With the seemingly inexorable increases in health care spending, and the ageing of our population, it would appear that true movement to serve the underserved probably won't happen any time in the near future. Our proposal is to use existing facilities, expand the presence of allied health care providers, and allow them to provide services which are currently not be offered in many areas. This is only a first step, and yet we feel a critical one if we are to produce solutions to this problem.

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THE QUALITATIVE AND QUANTITATIVE EFFECTS OF PATIENT CENTERED MEDICAL HOME IN THE VETERANS HEALTH ADMINISTRATION

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INTRODUCTION

Since the 1990's, the Veteran's Health Administration (VHA) has implemented a system of primary care that has been considered some of the best care that can be offered (Klein, 2011). The Patient Center Medical Home (PCMH) Model, also called "Patient Aligned Care Team" (PACT) in the VHA, t been coordinating and integrating services which ensure optimal health outcomes at an acceptable value (Bidassie, Davies, Stark, & Boushon, 2014).

PACT was created in 2010, building on 20 years of the VHA transforming from a loosely based system of inpatient services to a provider of outpatient primary care for veterans. From 2010 until 2011, their primary care staff levels decreased from 2.3 Full Time Equivalents (FTE) to 3.0 FTE, and in there was a reduction in face to face encounters as it was increased telephone consultations and electronic messaging (Trivedi et al., 2011).

However, PCMH was not a new concept created by the VHA. In the 1960s, a PCMH like concept was applied to care for Children with special needs (Kilo & Wasson, 2010). This concept was expanded into PCMH with the introduction of Joint Principles of Patient Center Medical Home by a collaborative effort of the American Academy of Family Physicians, the American Academy of Pediatrics, the American College of Physicians, and the American Osteopathic Association (AAFP et al, 2007). Along with the VHA, the centers for Medicare and Medicaid (CMS) have been researching the implementation of PCMH programs to help control costs (Landon, Gill, Antonelli, & Rich, 2010, and CMS, 2007).

PCMH has been defined in several ways, however the standard model used by the VHA is the one created by the Agency for Healthcare Research and Quality (AHRQ), which has stated that PCMH encompasses five functions, which are comprehensive care, patient-centered, coordinated care, accessible services, quality and safety. Comprehensive care means that a majority of the patient's care has been accounted by the PCMH organization, including prevention, acute care, chronic care, wellness and mental well-being (AHRQ, 2015).

Patient Centered means that the patient is treated as a whole person. This is done by having a Primary Care Physician (PCP) who is responsible for the patient's care (Carver & Jessie, 2011). Coordinated care is when the PCP coordinates care across a broader spectrum of services, like referring the patient to a specialist for a specific illness. However, there is a chance that these specialists will be over utilized, and there may be a diminishing aspect to coordinated care (Fix et al, 2014).

Accessible services have been defined as services which are available to the patient when they need them, without long waits. A team based approach makes this easier to achieve, using a central PCP and several PCP support providers, and a team of specialists who the PCP can refer to. (Helfrich et al, 2014). Lastly, quality and safety are key issues in PCMH. Providers are expected to be well treated and not overloaded with cases, which can cause a patient's issues to be overlooked, and this is where the team approach comes in again, helping to have a well-rounded pictures of the patient's issues (Liss et al 2013).

The VHA meets all five core functions under the PACT system, notably with the Peer to Peer toolkit, which permits the PCP to coordinate care with multiple specialists, and allows the exchange of electronic health records, which meets the requirements for accessible services, comprehensive care, patient centered, and coordination of care with one system (Luck, 2014). Quality metrics are hard to come by because most PCPs under

the pact program see quality metrics to be a hindrance to the spirit of the PACT program, because responding to the performance metrics consume time and resources, and these quality metrics do not take into account the spirt of PCMH (Kansagara et al, 2014). The purpose of this research was to analyze the effects of PACT on the VHA to determine expenditures and the overall outcome of patient care.

METHODOLOGY

The primary hypothesis of this study was: that utilizing the PCMH program, PACT, in the VHA would increase access and quality of care while decreasing costs.

The methodology for this literature review was conducted using a systematic search of key words which were related to the content of VHA, PCMH, PACT, and the challenges facing the VHA. When executing the search, the following terms were used: "VHA," AND "PCMH" AND "PACT" OR "cost" OR "access" OR "quality" OR "barriers." A mix of databases and online sources were used to compile a set of references covering both academic peer reviewed research and practitioner literature (grey literature). The following electronic databases and sources were used: EBSCOhost, Pub Med, ProQuest, LexisNexis, and Google Scholar. The stages in the literature search encompassed: defining the search strategy, identifying the inclusion and exclusion criteria, assessing the application and validity of the studies retrieved, and extracting and analyzing the findings.

The research also involved a semi-structured interview with an expert in the VHA located in Huntington, West Virginia. Dr. James Duthie, the Associate Chief of Staff Ambulatory Care, has provided his professional knowledge and experience with PACT which has been enacted in the VHA. This interview was digitally tape recorded, and only relevant answers were used to support the information found in the literature review to provide a contextualized and more comprehensive overview of this program implementation (See Appendix).

Only articles that were written in English were included for review. Attempting to stay current in research, all journals and references that were older than eight years (starting from 2007) were eliminated from the search to ensure the most recent data. This literature review yielded 14 references which were used in the introduction while 10 sources were used in the results and tables. This literature search was conducted by SL and ES and validated by AC, who acted as second reader and also double checked if references met the research study inclusion criteria. The findings are presented in the subsequent sections of the results using the categories of the positive and negative effects of PACT on the VHA. The implementation and transitioning process has been shown in the conceptual framework in Figure 1 below. The transition began with the initial study of patient interactions, which to reviewing quality of care, then to redesign of the healthcare program, and implementation of the PACT system in the preceding years (See Figure 1).

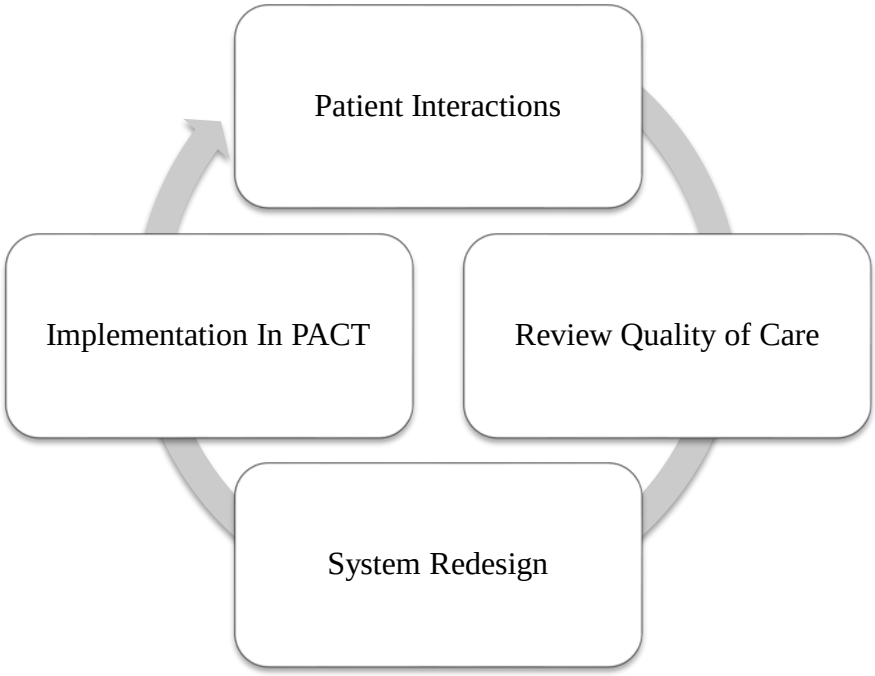

Figure 1: Conceptual Framework of PACT
Source: Dr. James Duthie

Figure 1 depicts the process of PACT Implementation in the VHA system. To research the impact of PACT in the VHA system, it is first necessary to recognize the way PACT evolves over time. Then different applications can be identified to solve or partially unravel these challenges. As a final result of analyzing the literature, the benefits and barriers of PACT utilization in the VHA can be identified (Figure 1).

RESULTS

Costs and Utilization of PACT in the VHA

One of the key factors that have caused significant concerns with the current U.S. healthcare system has been the enormous expenditures which have plagued the industry (Huarng & Yu, 2015). PCMH's have shown the ability to reduce costs for the VHA and other healthcare facilities which have adopted the medical home features. In one study, the patients within the 814 VHA clinics who had the highest access to healthcare, as well as efficient scheduling through PCMH's could lower the costs by 17% for an Ambulatory Care Sensitive Condition (ACSC) than other patients (Yoon et al, 2013). These factors can aid in significantly reducing the costs for preventative hospitalization and expensive emergency care. Continually, if the clinics in the same study were transformed into the maximum level of adoption for a PCMH, the estimated probability of an ACSC could potentially decrease from a 1.51% to a 1.36%, which was projected to be upwards of $100,000 in annual savings in 2010 (Yoon et al, 2013).

Reduced costs with implementation of PCMH's can also be seen to occur within the pharmacy, ancillary, and total medical costs of Pharmacy Expenditures Per member Per quarter (PMPQ) sections of healthcare. A study had used PCMH features to aid in decreasing costs with patients that experienced chronic conditions, patients without chronic conditions, and an overall projection of costs with all patients regardless of the condition (Christensen et al, 2013). Table 1 results illustrate the summary that overall pharmaceutical costs decreased by 12.5%, ancillary costs decreased 15.5%, and PMPQ decreased by 9.5% (See Table 1).

Table 1: The Reduction of Costs Associated with Implementation of a PCMH.

	With Chronic Conditions	Without Chronic Conditions	All Patients
Pharmacy Costs	-14.0%	-9.5%	-12.5%
Ancillary Costs	-17.0	-13.0	-15.5
PMPQ Costs	-10.5	-7.0	-9.5

Source: Christensen et al (2013).
Notes: Pharmacy Expenditures Per Member Per Quarter (PMPQ)

Table 1 has shown the decrease in costs by percentage in the pharmacy, ancillary, and PMPQ costs with a range of -7% to -17% cost savings for the healthcare facility which implemented the PCMH. The financial savings were seen in the categories of patients with chronic conditions, patients without chronic conditions, and the overall percentage of patients regardless of their conditions (See Table 1).

Moreover, the utilization of PCMH in the VHA has changed the patient encounters for various medical visit needs in a given year. Emergency Room (ER) visits have shown an overall 6% decrease of usage, specialty provider visits have seen an increase of 3%, and primary care visits have a projected to be an increase of 21% in overall usage in a given year (See Table 2). Table 2 shows that costly ER visits have decreased in patient use. However, an increase in use of less expensive specialty care and primary care providers have increased, which has shown a further aid in reduction of costs for a healthcare facility (Christensen, 2013).

Table 2: The Increase or Decrease in Patient Encounters with Various Medical Needs.

	With Chronic Conditions	Without Chronic Conditions	All Patients
ER Visits	-7.0	0.0	-6.0
Specialty Care Visits	-3.0	15.0	3.0
Primary Care Visits	27.0	0.0	21.5

Source: Christensen et al (2013).

Table 2 has illustrated the possibility of decreasing costs through the utilization of PCMH's in the VHA by increasing preventative care through the use of less expensive primary and specialty care, in turn having an expected decrease of patients visiting the ER. Continually, the numbers that are 0 can be located under Chronic Conditions. The 0 number can be associated with patients which are either referred to or seek out Specialty Care Providers for their specified Chronic Conditions, and not with ER or Primary Care visits, implicating 15.0 for Specialty Care visits. These factors can lead to further research and implementation for other healthcare facilities to consider adoption of a PCMH to reduce expenditures.

Despite several studies that have shown a cost savings after implementation of a PCMH, other studies have resulted in mixed reviews, as some have found no change in costs, and some have actually increased in costs (Werner, Canamucio, Shea, & True, 2014). Studies have explicated how more rigorous studies and analysis should be made in order to better understand the benefits and barriers with implementation of PCMH and cost savings. For example, one study showed only one of three organizational processes that were tested had consistently improved with association to PACT, which involved nine variables indicating whether PACT providers had implemented structural changes in each study period (Werner et al, 2014). In addition, another study showed no significant differences in costs after 12 months of analysis of the PCMH implementation (Reid et al, 2009).

The estimated costs that had been associated with implementation from the VHA in the year 2012 reached $774 million in expenses (Hebert et al, 2014). Most of the expenditures resulted from the need of hiring new staff for the coordinated care, as well as a significant amount of training for current and new staff. However, the

discounted costs that followed the implementation of the PCMH had come to a financial savings of $596 million in 2012 due to increased efficient utilization in the VHA (Hebert et al, 2014).

Quality of Care with PACT in the VHA

In contrast to the erratic results of cost savings with PCMH, various studies have shown a consistent increase in the quality of care provided for patients (True, Stewart, Lapman, Pelak, & Solimeo, 2014). PCMH has been built on what has been called the team-approach, wherein the responsibility of the patient's health is spread across an interdisciplinary team working coherently, but with mixed independence to perform healthcare tasks. The application of team-based healthcare has shown to be essential to the proper functions and success of PCMH's performance and abilities. Healthcare facilities transitioning to PCMH must engage with the staff, and ensure the resources and support has been provided to evoke team work, which is essential to the success of PCMH's (True et al, 2014).

The quality has shown significant increases in several literature reviews, illustrating the importance for implementing a PCMH. For example, an observational study had utilized data on more than 5.6 million U.S. veterans who received care at over 900 VHA facilities, tracking the results of quality of patient services (Nelson et al, 2014). The authors found that patients had higher satisfaction with their healthcare, and higher clinical performance on 41 of 48 quality measures. Moreover, due to higher quality of care, there was a reduction in ACSC and lower emergency department use (Nelson et al, 2014).

Access to Care for Veterans

The PCMH has been able to increase the accessibility of healthcare for patients in the VHA. Rosland et al (2013) conducted results of access to care from 2009 to 2012 in 850 VHA facilities for optimum collection of data. The results had indicated an increase in same-day requests for appointments from 67% in 2009 to 73% in 2012 (Rosland et al, 2013). Moreover, the researchers found that phone encounter rates had increased 10-fold from 2009 to 2012, showing a significant difference in accessibility and quality of care given to the VHA patients (Rosland et al, 2013). Finally, the total number of inquiring messages from patients to primary care staff had increased from 9,852 in 2010 to 289,519 in 2011, which has shown an enormous increase in access between patients and their healthcare providing staff (Rosland et al, 2013).

DISCUSSION

The purpose of this study was to determine the qualitative and quantitative effects of the PACT in the Veterans Health Administration. In the study, PACT was identified as having several benefits, which were represented by three pillars. The first is allowing veterans better access to care, through making them the center of their care. The second pillar is involves better coordination of care, which means the veteran's care team will be better prepared to help through setting up consultations, testing and other services before the appointment so there is less time wasted by the veteran. The third and final pillar is called system redesign. The VHA reviews how the current system is working and updates it to meet the needs of the veterans, such as implementing better electronic health records or tele health services so the veteran has easier access to providers (Chaiyachati et al, 2014).

The increased staffing and space requirement of PACT has been a potential barrier to its implementation. However, the VHA has found ways around this through shared medical appointments. Shared medical appointments are when the VHA schedules several veterans who with the same condition and have agreed to receive shared medical appointments. They come in and have their vitals taken individually and privately by a nurse, and then have a general group meeting with the primary care physician about their condition. If any individual has specific problems to discuss, this is then done privately in the physician's office.

Another issue with PACT has been the high turnover rate of providers working for the VHA (Chaiyachati et al, 2014). The core to PACT is the team of individuals who work together and learn their patient's needs. However, when one person leaves the team and is replaced by someone else, this can cause an issue as the new provider is required to play catch up and the team dynamic may change.

The disadvantages discussed may not be as important as the advantages to the implementation of the PACT program. Medical Centers such as the location in Huntington have seen a significant improvement in patient satisfaction since the implementation of PACT, and while costs may not have been contained, they have not increased. Therefore, results have shown to be inconsistent and unreliable with different studies, and more testing should be completed on cost savings with PACT to validate its financial benefit to a healthcare facility. Also, the quality of patient care has increased as the focus of the VHA's attention is on the patient as an individual instead of veterans as a whole. Although the program has areas to improve upon in the coming years, it is still in the early stages of implementation and will benefit more from continuous redesigning from observed patient interaction. PACT will continue to develop into a program that will center the care of veteran's as an individual to ensure optimum quality and access to healthcare in the coming years.

LIMITATIONS

This research study was not without its limitations. Empirical studies on the utilization and implementation PACT in the US health care facilities had varied results. There was limited information which showed a consistent result of impact on overall quality, either positive or negative, that PACT has and will have on the U.S. as it is implemented in all VHA's. Financial information was also a limitation due to it only being an estimated cost as many of the VHA facilities have only had PACT implemented for a few years. Further research now and in the future will be required in order to see the true impact that PACT will have for VHA's on the quantitative and qualitative care for veterans. This literature review was limited due to the restrictions in the search strategy used, such as the number of databases accessed and finally, publication and researchers bias cannot be ruled out.

Practical Implications

The literature review has shed light on the various benefits and changes that can be seen with the implementation of the PACT program within the VHA. The U.S. healthcare system has worked to develop ways to aid veterans in better access and quality to care, while attempting to limit the expenditures entailed with the medical needs. Although quality overall has shown an increase for veteran care with the PACT program, the costs associated with the program have not shown any difference, or have been slightly higher before the implementation. The mixed results and assumption that PACT would have tremendous outcomes for cost savings with care for veterans has been grossly overestimated, exemplifying the need to continue to assess, redesign, and implement new strategies in the VHA for the future . However, the quality and access to care have shown increases and more positive outcomes, creating an optimistic outlook that PACT is one step in the right direction to ensure veterans are receiving the best access and quality of care that can be provided in the U.S. healthcare system.

CONCLUSION

The PACT program has shown varied results in costs as an increase, decrease, or at no change in the expenditures of the healthcare facility. However, research has shown a more positive consistency in the quality and access to care in the VHA for veterans, ensuring they are receiving the healthcare which is needed. PACT continues to evolve and develop as more VHA facilities fully adopt and implement the program, working to provide healthcare to veterans in the United States which focus on individual results.

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TRACK
HOSPITAL MANAGEMENT

FACILITIES AND ITS INFLUENCE ON HEALING AND WELLBEING OF PATIENTS AND EMPLOYEES

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ABSTRACT

Especially due to case related payments efficiency gets more and more important in the healthcare sector. The largest costs are connected with the healthcare staff. The second largest cost is related to facilities. In relation to facilities the most common management approach is cost cutting. But simple cost cutting can lead to a high inefficiency as it could deteriorate the recovery of patients and the well-being and performance of nurses, physicians and other healthcare workers. The hypothesis of this paper is that after the quality of healthcare staff, facilities have a major influence on the recovery of patients. According to literature the room climate has a major influence on the recovery and well-being and performance of patients but also of employees.

To prove this hypothesis an intensive literature research was carried out. In a first step more than 150 laws and standards from Europe, USA and Asia were analysed to find out the legal and normative requirements for different room types. In a second step literature was analysed to find case studies that prove the hypothesis and validate the previous defined list of requirements. In some cases the found case studies provided even more precious requirement's definitions than the legal and normative sources. In both steps data was validated by expert workshops.

The paper will present the findings of the literature research. In detail these will be the room climate requirements (Thermal Conditions, Indoor Air Quality, Lighting Conditions, Acoustic Conditions) for specific room types and their impact on the recovery of patients. The authors also look for cooperation with healthcare institutions to validate the literature findings in practical case studies as a next step

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EMPLOYEE TURNOVER INSIDE ASSISTED LIVING FACILITIES

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ABSTRACT

Employee satisfaction is important for any employer who is operating a healthcare facility. Employers who operate a long-term care (LTC) facility should want to keep their employees satisfied and know the most important aspects in keeping employees satisfied. If LTC facility employers knew exactly how to keep their employees satisfied, it could lead to lower turnover rates and better quality of care for the residents. Unsatisfied employees in healthcare leads to poor quality care, complaints from patients, and higher turnover rate (Bowers, Edmond, & Jacobson, 2003). Satisfied employees within a healthcare organization creates a better atmosphere. High turnover in the nursing department in LTC makes it difficult to find reliable and consistent care and services that are geared toward residents' needs (Nakhnikian, 2005). This paper focuses on employee satisfaction in five long-term care facilities in the Midwestern United States. The paper explores the problem regarding employee turnover in the nursing department in LTC facilities. Also, this paper examines the primary causes of turnover in the nursing department of a specific long-term care facility in the Midwest. Lastly, this paper discusses the design, sampling methods, measurements, and variables that are affiliated with this research project.

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MENTOR PROGRAM UTILIZATION AND EFFECTIVENESS SURVEY AND ANALYSIS

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ABSTRACT

This paper aims to address problems that are inhibiting the effectiveness of the mentoring program at a Nebraska hospital. The literature on mentoring was reviewed, a survey on the experiences of the mentors and mentees with the program was conducted, and coordinators of mentor programs at three hospital facilities were interviewed. General themes were derived from the surveys and were combined with the information gathered through the interviews and the literature to develop several recommendations for improving the mentor program.

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OPTIMIZATION OF A HOSPITAL CLAIMS MANAGEMENT SYSTEM – A CASE ANALYSIS

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ABSTRACT

The purpose of this study was to assess the current utilization of a Midwestern hospital claims management system, identify opportunities for improved utilization, and provide recommendations to increase the acceptance rate of claims for the health system.. The study involved working with the claim system management vendor to perform an analysis of the insurance claims the health system submits via a third-party claims clearinghouse. In addition, a features and functionality utilization check-up was performed to determine how the health system was currently utilizing the system. The purpose of the assessment was to determine what areas of focus for the health system to decrease the number of errors on health insurance claims and to increase the clean claims acceptance rate. The results of the assessment identified how the health system was underutilizing the tools offered by the third-party vendor to more efficiently process electronic health claims. In order to compare how the health system was performing as compared to its peers, interviews with other health systems were performed, and the survey results were interpreted. The results, impact, potential outcomes, and limitations from the project will be discussed in the case presentation.

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TRACK
INTERNATIONAL

GLOBAL HEALTH MANAGEMENT COMPETENCIES: A FRAMEWORK FOR EFFECTIVE MANAGEMENT TRAINING

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ABSTRACT

Global health management has a unique body of knowledge with specific competencies. The authors have worked with several members of the AUPHA Global Healthcare Management Faculty Forum developing, analyzing and testing a competency scheme that managers need to address the complexity and diverse characteristics of healthcare organizations around the world. The model takes into consideration relevant and current knowledge on global health issues; attitudes and behaviors required for multi-cultural understanding and effective transcultural communication; concept and analytical skills required for identifying and effectively applying global managerial best practices; attitudes, behaviors and skills necessary for developing community assessment and collaborative partnerships and networks.

Given the increasing interests in globalization, this session focuses on applications of this competency framework to facilitate the activities of scholars and professionals that work with managers around the world improving the performance of health services.

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MEDICAL TOURISM IN INDIA: PROSPECTS AND PROBLEMS

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ABSTRACT

Medical Tourism is becoming popular as a means of getting medical procedures that can be carried out at places other than the patient's home country, at a lower price. While most reports are favorable with patients getting services they could not otherwise have been able to afford, concerns have also been raised about the quality of hospitals and doctors not subject to the same standards as in the developed nations. This research looks at one of the leading destinations of medical tourism, India, and examines the opportunities and challenges.

Medical tourism has become a growing trend in the recent years. It refers to the practice of patients traveling abroad for medical treatments. However, it differs from previous trends of patients traveling from developing nations to developed countries for what was expected to be more advanced treatment options. Instead medical tourism today refers to residents of highly developed nations bypassing the healthcare offered in their own countries and traveling to less developed parts of the world to receive a variety of medical services. They usually pay out-of-pocket and enjoy a vacation at the same time. Some of the reasons cited for the growth of this trend are cost savings for uninsured or underinsured patients, no waiting period or the procedure not being available in home country (Levary, 2011).

There are no verifiable statistics, but McKinsey and Company estimated that the worldwide revenue from medical tourism will rise to $100 billion by 2012. (McKinsey & Company and the Confederation of Indian Industry, cited in Laura Moser, "The Medical Tourist," and Bruce Stokes, "Bedside India") Even as the number of patients availing themselves of medical services away from their homeland grows, the information available to them and their families is still incomplete or confusing. Credentials of the doctors, facilities available at the hospitals, quality standards all vary from country to country leaving the patients wondering. The constant media focus on the issue has not helped much, choosing to focus instead on anecdotal instances rather than aggregate data (for example, see this article in Good Housekeeping[*]).

The biggest draw of receiving medical services overseas is the low cost but at the same time, most patients expect the best possible quality as well. When it comes to a life-altering procedure like cardiac surgery or hip replacement, patients are unlikely to see cost and quality as acceptable trade-offs. The variability and non-standardized nature of medical services make it difficult for the consumer to evaluate alternatives before purchase. The purchase of a credence service such as medical treatment is riskier because consumers are not confident of their abilities to judge the goodness of the service (Murray and Schlachter 1990) . Perceived risk, uncertainty and consequences of the decision, affect the extent of search and information sought (Bauer 1960).The variability and non-standardized nature of credence services lead to uncertainty about the actual cost and product performance (Murray and Schlachter, 1990) and make it difficult for the consumer to evaluate alternatives before a purchase. Services with a higher proportion of credence attributes would present a greater challenge to consumers and marketers alike.

While these are serious questions in the customers' minds, they are just as important to the hospitals and medical providers. The challenge is to reassure patients and their families about the quality of service they will receive at a facility they may not know much about. Marketing communications such as advertising may work but often have limited effectiveness in credence services such as medicine.

Other ways hospitals do that is through accreditation. Many hospitals claim to be accredited, though there are different bodies carrying out this accreditation which again leads to a situation where consumers end up having to compare 'apples and oranges.' Some may select a healthcare provider because it is "JCI accredited" or has some other form of accreditation. But for many patients, JCI accredited may mean little. Knowledge of accreditation

systems amongst patients varies widely. Many patients have no idea what JCI accredited means, and may have never heard of JCI (Pollard, n.d.).

This research examines these different challenges and opportunities before the medical providers interested in gaining patients from overseas.

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THE EMERGENCE OF YOGA IN HEALTHCARE: A REVIEW OF THEMES AND ISSUES

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ABSTRACT

In recent decades, yoga has emerged as a significant component of preventative and therapeutic healthcare modalities in the United States. While the exact beginnings of the practice of yoga in the United States are probably older, the awareness and adoption of yoga as a spiritual discipline and/or health maintenance and enhancement regimen can be traced to the increasing popularity of Indian origin spirituality and culture in the 1960s. Simultaneously in this period, there has been a substantial amount of research focused on establishing, through scientific scrutiny, the value of yoga in healthcare, which in turn may have stoked further interest and popularity.

While yoga has continued to grow in popularity, and a multi-billion dollar industry – by one estimate (Gregoire, 2013), $ 27 billion – under the umbrella of yoga has developed, it may be appropriate to survey the issues that are germane to its continued growth, and the benefits of health and well-being derived from it for the future. To this end, this paper seeks to explore dominant and emergent themes related to yoga from the dual perspectives of healthcare and business. Using a review of the academic literature as well as a reading of the popular and business press on the issue, we identify important themes and issues that are deserving of further research attention.

According to the National Institutes of Health 2015 survey, 9.5% of United States adults report having practiced yoga, a significant increase from 6.1% in 20017. Additionally, 3.1% of U.S. children had also reported practicing yoga. Yoga Journal, a forty year old consumer publication, claims a print readership of over two million, and over five million page views of its online presence. From a little known practice associated with Indian spirituality, yoga has become mainstream, with increasing amount of materials and classes available at various venues. While it has gained increased popularity as a fitness regimen, it has is also been included in disease prevention programs by organizations such as the Centers of Disease Control, and included as a cardiac rehabilitation modality by Medicare.

The increased popularity of yoga has led to a creation of what may be called the "yoga industry," which comprises of several subspaces offering a range of products and services. The yoga industry can be classified into: instruction, infrastructure, accessories and supplies, media, and instructor education and certification. Instruction remains largely an individual enterprise, with the infrastructure (studio space) being packaged with instruction, or provided by third parties such as gyms, health clubs and recreational or social organizations. With the increased popularity of yoga, the availability of accessories such as yoga mats, and clothing, has also increased, with a relatively new brand such as Lululemon establishing a strong market presence, and becoming synonymous with yoga clothing. The availability of media (both print and online) has similarly increased, with several media brands purporting to provide information on all things yoga. The education and certification of instructors remains limited, with competing credentialing organizations, sometimes without adequate rigor or validity.

Who practices yoga? In a review of previous studies on the subject, Park, Braun and Siegel (2015) found the following indicator: the practice of yoga in the U.S. is dominated by Caucasian heterosexual females who are educated, middle-aged, and are from higher socio-economic strata. In numerous studies, practitioners have reported several realized benefits and indicated some psychosocial markers that could be associated with the practice of yoga. Considering that the benefits of yoga are now widely acknowledged, what could be the barriers to even wider acceptance of yoga among the general population. We found several: a primary barrier is the perception of Hindu spirituality associated with yoga, insofar as the practice of yoga is perceived as (or presented as) the acceptance or adoption of an alien faith system. This perception is sometimes sought to be enhanced by ideological interests who introduce a xenophobic element in the perception of yoga. A second barrier, especially for

males, is the nature of yoga—the lack of forcefulness and vigor in yoga practice, which is seen as a not serious enough form of exercise. While the practice of yoga itself does not require any expensive accoutrement, the lack of easily accessible and affordable yoga infrastructure and instruction, especially in lower-income areas, is another barrier to the adoption of yoga. Yoga instruction in the U.S. is also largely in English, which could be a barrier for greater adoption in communities with a primary language other than English.

While yoga has been growing in popularity, the question of the quality and authenticity of the product needs to be raised. As with many other branches of physical training, the certification of instructors and their competence is often questionable. This lack of standardized – or at least certified – product is one of the factors hampering greater growth of yoga.

Yoga in the United States and much of the world, is still a nascent discipline. The full potential of the practice of yoga has not been tapped, and its benefits have yet to be know, much less realized, by the world population. This state of affairs presents a number of opportunities for academicians in public health and health education, as well as challenges to policy makers in these areas. Identifying the nature of the yoga industry, existing patterns of practice and the practitioner base, is a beginning. We recommend a greater engagement with hitherto unreached or uninterested consumer groups, a greater focus on the health benefits of yoga over ideological linkages, development of a credentialing and licensing structure, and ideas to improve the accessibility and affordability of yoga.

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ASSESSMENT OF PAIN: KNOWLEDGE, ATTITUDES, AND PRACTICES OF HEALTH CARE PROVIDERS

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ABSTRACT

This study sought to present data on knowledge and attitudes toward pain assessment among health care providers in Madinah, Saudi Arabia. A convenience sample was recruited from four major hospitals in Madinah, Saudi Arabia.

Seventy-three participants scored 45% or below (69.5%), and 32 participants scored 45% and above (30.5%). Only six participants (5.7%) scored above 60%. There were significant differences between male and female scores $p = 0.05$, physicians' and nurses' scores $p = 0.001$, and level of education $p = 0.009$. There were no significant differences in the passing scores across means of nationality, the department where participants worked, years of experience, and age of participants.

In conclusion there is a deficit in pain assessment knowledge and pain management in the study group. Majority of participants in this study showed the need of continues education about pain assessment to increase their knowledge and enhance their practices regarding pain assessment and treatment.

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ESTABLISHING A FAMILY PLANNING PROGRAM: A CASE FROM SAUDI ARABIA

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ABSTRACT

Unplanned pregnancies could prevent women from spending more time with their children and taking care of them, and having high level of education and suitable jobs. There are many factors that contribute to limit contraception among Saudi women. In Saudi population it is usually for family to have many children, and Saudi women are not highly knowledgeable about the types of contraceptive methods. As a result, there are significant needs for a family planning program to provide women with cheap and safe contraceptive methods. This financial project discusses that a family planning program that is provided by King Abdulaziz Specialist Hospital and how this program can encourage Saudi women who aged from 20-45 years to choose the safe and appropriate contraceptive methods and to use birth spacing. Also, the outcomes of this program are enhance awareness of Saudi women about birth control, increase planned pregnancies among the women, and help them to have the best health reproductive services. A questionnaire will be used to evaluate outcomes of this program. Moreover, the subsequent financial documents will provide insight into how the program would be funded as well as marketing strategies to encourage women to participate in the program. By offering this family planning program women can utilize the information to assist them in making healthy suitable choices.

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HEALTH RISKS ASSOCIATED WITH WORKING WITH COMPUTER: RESULTS FROM NATIONAL SURVEY IN 2013

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HEALTH RISKS ASSOCIATED WITH WORKING WITH COMPUTER: RESULTS FROM NATIONAL SURVEY IN 2013

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ABSTRACT

A lot of people spend on their computers (PC) for more than 12 hours a day. Conditions of a work on a display, such as computer, notebook or tablet at home are often not optimal, with minimal lighting, often only with television flashing lights. Although we are aware of the risks of our behavior, we either underestimate it or ignore it. This inspired us to do the research of how we behave with computers in home conditions. The goal was to objectify factors of work with computers and working environment in home users, check the length of exposure and subjectively perceived health problems respondents. 2,465 respondents were enrolled in survey. We found that 66.9% of respondents perceived at least one adverse effect of computer work or unfavorable environmental factor while using your computer. High incidence of subjective difficulties - up to 78.05% (n = 1924) corresponds with this fact as well. The most commonly observed health problems included visual disturbances (visual fatigue, burning, watery eyes, twitching, tics and short-term numbness vision - 50.26% of respondents, n = 1239, photophobia, blurred vision - 13.83%, n = 341) and difficulties associated with work-related musculoskeletal system (backache was reported by 32.52% of respondents, n = 804, muscle pain and muscle stiffness - neck, rump 20.24%, n = 499, joint pain - wrist , elbow, shoulder 15.01%, n = 370). The results of our study highlight the need to address subjective perception of health problems of PC users, whether by adjusting workplace ergonomics, or eliminating visual adverse environmental factors and the need for public health measures in the form of education proper use of PC and proper habits.

INTRODUCTION

There have been numerous studies conducted to find the relations between working with computer or displays and health problems, mainly with musculoskeletal and visual systems. Since we work with technologies every day and use it as a part of our private life too, it is difficult to say whether health problems are consequence of bad habits, bad ergonomics or just spending too much time with computer. We have decided to conduct research on home conditions when working with computers or displays, compared with those we have at work.

METHODOLOGY

The survey was conducted through the questionnaire, which was intended to objectify factors of work at the display screen and the work environment of home users, to check the length of exposure and subjectively perceived health problems of respondents.

The survey covered 2,465 voluntary respondents, of which 90.79% were men (n = 2238) and 9.21% women (n = 227). Significant superiority of men is caused by the sources of the respondents. The main source was IT magazine, which released teaser for our survey (up to 50.5%). The advantage of this source was a high concentration of respondents spending many hours by working with PC, but on the other side there was lower representation of women. Another important source was various forums (22.2%), which were also less frequently visited by women. Based on personal responses we assume that a significant source of female respondents was

Facebook (7.3% of total responds). Involvement in the survey was voluntary and fewer women demonstrated willingness to complete the questionnaire.

Most respondents - 73.75% (n = 1818) were in the age of 15-29 years, furthermore, 21.14% of respondents (n = 521) was the age structure of 30 - 44 years and 3.12% (n = 77) in the age 45 to 59 years.

RESULTS AND DISCUSSION

Visual Difficulties

Respondents most frequently reported short-term visual fatigue, burning, watery eyes, twitching, tics and short-term blurred vision - 50.26% of respondents (n = 1239). Other subjective perception of health problems were back pain, which was reported by 32.52% of respondents (n = 804), muscle pain and muscle stiffness (neck, rump, etc.) - 20.24% (n = 499), joint pain (wrist, elbow, shoulder) 15.01% (n = 370), photophobia, blurred vision - 13.83% (n = 341), decreased skin quality (increased oiling of skin, acne and other 12.33% (n = 304), fatigue which caused interruption of PC work - 9.29% (n = 229), dizziness or nausea when working long time - 7.1% (n = 175), stress - 6.94% (n = 171), and anxiety 4.67% (n = 115). These difficulties appear to be also the main cause of sick leave (Abib - Dutta, 1998).

Opinions of the authors and the results of many studies on visual difficulties of PC users are different. For example, surveys of several government and private agencies in the US and Europe show that 94% of respondents suffer from sore eyes and headache in connection with the use of a computer (Gecelovská, Gážiová 2009). Other authors indicate the range of visual difficulties 40-80% (Smooth, 2002, p. 67, Hlavkova 2006, Sobratty - Korumtolle, 2005). The NIOSH study states that 75% of users of display screen reported intermittent pain, eye burning and another 37% blurred vision (Gilbert - Matousek, 2002). State Health Institute in Prague carried out their own research on several data centers confirming the high incidence of the above-mentioned subjective visual difficulties at work, some of which, even modestly persisted after working time (Matousek, 2000, Gilbert - Matousek, 2002). The results of various studies vary considerably, depending on the methods of investigation. For example, in the aforementioned studies, experts found no relationship between the work with display screen and the prevalence of pathological changes in visual function. Same conclusion was reached in a study by WHO in 1990. Even long-term monitoring of people (for 6 years) conducted in Australia (Cole, 1992) did not confirm the hypothesis that work with display screen can damage the eyes (Gilbert - Matousek, 2002). This conclusion was reached also by other studies and various authors (Matousek, 2000b, Olah, 2005, Mutti - Zadnik, 1996, Mathieu, 1992 Toppel - Neuber, 1994 Hladky, 2002).

Currently, new civilization diseases include dry eye syndrome, which is one of the consequences of day to day computing, long-term television watching or driving, therefore all activities which reduce blinking. This syndrome bothers one in five patient visiting ophthalmologists (Hatina, 2007) and is found mainly among people over 50 to 60 years. According to physiological studies, work with display decreases winking by 32-42%, which increase evaporation of tears with a simultaneous decrease in irrigation of the cornea (Olah, 2005, Acosta et al., 1999, Smooth, 2001). Other sources indicate that the blinking decreases during work on a display up to five times, but the stability of the tear film is not affected (American Academy of Optomerty, 1991). The tear film also allows oxygen supply to the cornea. Since the cornea has no blood vessels, it is dependent on this method of oxygen delivery. Furthermore, the tear film contains bactericidal substances (lysozyme and lactoferrin, specific antibodies) which protect eye from infection (Hatina, 2007, Hladky, 2002).

Subjective difficulties in working with PC mainly dictated by the need muscular effort when requesting continuous focus - moving around looking at three different short distances (text, keys, display). According to the researches of physiological changes during work at least 30,000 focusing take place, from 12,000 to 33,000 head movement and about 4000-17000 reflectory pupil constriction. Subjective complaints are perceived as "congestion of vision" and lead to a distortion of visual well-being at work. All health problems related to work on the PC screen, can be solved by purposeful layout of workplaces and more appropriate distribution of work and rest regime (Olah, 2005). Research of accommodative and adaptation processes indicated that eye problems are transient and reversible, and tend to return to normal after resting. (Hladky, 2002).

Subjective complaints about vision tend to be particularly marked in individuals with co-present changes in the muscular system and spine (about 75% of workers) (Olah, 2005). Conversely, inadequate or improper lighting or any malfunctions of vision can condition forced posture and thus indirectly give rise to musculoskeletal difficulties (Gilbert - Matousek, 2002, Majer et al., 2006, Korhonen et al., 2003). These difficulties are therefore interdependent. Some of the many studies conducted indicate that some of the complaints about visual difficulties of personnel working with displays is likely to be also unpleasant expression of psychological discomfort of working conditions (Hladky, 2003, Seppala, 2001 Bergqvist et al. 1995 Ritchie - Hutchison - Mulholland, 2007).

We managed to prove that the perceived short-term visual fatigue, burning, watery eyes, twitching, tics and short-term numbness of vision are dependent on the distance of the eyes from the monitor. Short distances (approximately the length of the forearm) had the highest prevalence (53.51%, n = 297), medium range (approximately the length of the arm) showed a prevalence of 50.34% (n = 825) and maximum distance (approximately as 1, 5 times the length of the arm) showed a prevalence of 43.17% (n = 117), $p < 0.05$. The differences in the perception of subjective visual difficulties regarding the size of the monitor we have failed to demonstrate statistically not even in one of the factors examined. Also, we have failed to demonstrate the dependence of visual difficulties since the age of respondents. The fact that the female gender is more vulnerable to eye perception difficulties (Seppala, 2001) we therefore failed to prove. According to our findings, the sensitivity to light or blurred vision complaint was more often in men (14.61%, n = 327) than in women (6.17%, n = 14), $p < 0.001$.

The literature reports that the length of the computer reading without interruption, which still doesn't cause subjective complaints, is about 2 hours. Exceeding the working time for more than six hours in individuals without pathological changes of the also occurs and it's called asthenopia (Olah, 2005, Hladky, 2001). The daily burden of working with displays should therefore not exceed six hours (Olah, 2005, p. 260). This knowledge correlates with our research. Four hours of cumulative exposure (1- 2 hours at work and 1- 2 hours at home, or max. 4 hours at home for those who are not employed) is sufficient to ensure that 50.45% of those (n = 56) perceived short visual fatigue, burning, watery eyes, twitching, tics and short-term numbness of vision.

Musculoskeletal Difficulties

One of the most frequently reported difficulties at work with display are musculoskeletal difficulties. For IT professionals it is the second most common disease occurring in causal connection with work on display screen (Pinto - Ulman - Assi, 2004). Backache is the actual problem mainly because it contributes to the high percentage of sick leave on average two days more than is the average length sick leave for other diseases. At the GP Practice backache represents more than half of treated patients and at the orthopedic clinic it's more than a quarter of treatment (Malovič, 2005). 86% of employees engaged in data processing are suffering from difficulties related with musculoskeletal system, of which highest prevalence has neck pain (58%). Of these, 49% of patients cited as the cause of neck pain the incorrect seating, 24% constant typing, 23% sitting in the same position for hours and 12% of patients cited maladjustment of computers (monitors). Hlávková (2006) states that in permanent seating position for example when working with PC, 60-80% of people is suffering from backache. Domestic European studies indicate that 60-90% of the population has pain in the lower spine, at least once in their lifetime, and at the same time about 15 - 42% of the world population suffers from these difficulties. 30% of European workers indicate backache, which means that this is the most common health problem related to work (Ravasová - Bátora, 2000).

However, negative symptoms are rarely limited only in spine, pain radiate much more likely to "remote" locations (head, shoulders, forearms, fingers and so on). Difficulties usually arise when the spinal column is in unnatural position for longer (long-term rigid position when writing or other work on the PC), or in the case of frequent rhythmic turning heads in one direction (Malovic, 2005).

In addition to suffering from backache upper extremities are tend to be affected too, especially at high frequencies of repeating movements of hands and fingers when operating with the keyboard or mouse. In such cases, the most common is inflammation of the tendons (tendovaginitis), tennis elbow and pressure nerve syndromes (particularly carpal tunnel syndrome). These difficulties may also have non-specific nature in the form of RSI (repetitive strain injury) syndrome (Gilbert, Matousek, 2002, Majer et al., 2006 Gilberova - Hlávkova, 2005). RSI is a handicap of the wrist caused by repetitive movements of a small scale in the computer without rest (Hladky,

2003b). Kesavaschandran (2006) states that increased risk of hand and wrist pain are associated with using a computer mouse for more than 30 hours a week or using a keyboard for more than 15 hours a week.

Mental tension and stress can increase muscle tension and thus cause difficulties on the part of musculoskeletal system (Hladky, 2002, Smith - Carayon, 1996, Torp - Riise - Moen, 2001, Burdorf - Sorock, 1997, Macfarlane - Hunt - Silman, 2000, Van Eijsden-Besseling et al., 2004, Korhonen, et al., 2003, Abib, 1998, Seppala, 2001, Bergqvist, et al., 1995, Ritchie - Hutchison - Mulholland, 2007), wherein female gender is more susceptible to perceived stress (Seppala, 2001).

Since our survey was focused rather on the domestic use of computers (another character of action with the PC - more relaxing activity than working with text, not likely to work under time pressure, lower stress levels, a better opportunity to influence workplace ergonomics, individual selection of furniture, better hardware) we found a lower prevalence of subjective perception difficulties, work-related musculoskeletal. Back pain in our study was reported by 32.52% of respondents (n = 804), muscle pain and muscle stiffness (neck, rump etc.) stated 20.24% (n = 499), joint pain (wrist, elbow, shoulder) 15.01% (n = 370) of respondents.

There are some differences between working with a computer as far as sex is considered. A study by Wahlströmom et al. (2000) has shown that female work with mouse in further range of movement and by bigger ulnar deviation of the wrist (toward the little finger). They also use a higher maximum force (Fmax%) for holding a computer mouse and have a higher muscle activity (as measured by the integrated electromyography) in the right extensor of the thumb. The fact that the female gender is more prone to musculoskeletal difficulties was proved by the studies of Jensen et al. (1998), Korhonen et al. (2003) and Evans (1987). Our research also demonstrated the difference between men and women in the subjective perception of musculoskeletal disorders. The joint pain was complained rather by men (15.59%, n = 349) than women (9.25%, N = 21), $p < 0.001$. Conversely, women complained to back pain (39.21%, N = 89%) more than men (31.95%, n = 715), $p < 0.05$. This corresponds with the statement that women work a mouse with a greater range of motion, and therefore have a higher muscle activity in the right and left trapezius and also have the highest rating of perceived exertion of neck and shoulders. Men control the mouse motion score in the wrist and use more muscle power applied to the side of the mouse and at the same time have a high rating of perceived exertion wrist hands and fingers (Wahlström et al., 2000).

In our research, we also compared the subjective complaints of those who used mouse mainly for control and respondents who use the touchpad for control mostly. Examined differences in subjective health complaints in these two groups were not statistically significant, they are rather by chance.

When comparing the differences in the perception of subjective health problems, depending on the prevailing activity of the display screen, we confirmed the statistical significance only in factors - short-term visual fatigue and backache. 51.66% of respondents (n = 1028) who reported using computer mostly for working with text, graphics or they use to bring home unfinished work, experienced short-term visual fatigue. Those who use the PC mainly for relaxation activities - music and movies feel less visual fatigue (46.13%, n = 185, $P < 0.05$). 34.27% of respondents (n = 682) who reported that the computer used mostly for working with text, graphics or unfinished work, suffering from back pain. Those who use the PC mainly for relaxation activities - music and movies, suffer less back pain (25.69%, n = 103), $P < 0.001$.

The reported incidence of subjective health problems at work with display highly statistically significantly related to unfavorable working environment factors ($P < 0.01$). Interestingly, the majority of respondents are aware that there are adverse visual or ergonomic factors of working environment, and they often do not address them. The same is true for health problems. Only 21.46% of respondents (n = 529) in the case of health problems seek for medical help, but 53.85% (n = 1081) of respondents attempt to self-medicate and 34.16% (n = 842) of respondents do not solve long-term problems. We do not assume that it is the indifference, but rather the fact that these health problems are not so serious that the man is forced to seek a physician, or after the inclusion of longer breaks at work with display problems spontaneously disappear.

CONCLUSIONS

The results of our study highlight the need to address the problem of perceiving health problems by PC users, whether by adjusting the ergonomics, or eliminating visual adverse environmental factors and the need for

public health actions in the form of education of proper use of PC and proper habits. Legislative changes are insufficient, since occupational exposure to PC does not end at end of working day. Awareness of the health risks of computer work should be a public health goal to prevent underestimating these conditions resulting in serious health problems. Professionals in public health should appeal to PC users to try to prevent any deterioration of health by eliminating negative factors of PC and working environment. Public health must quickly adapt to current and modern trends, considering the number of people who use these modern technologies. Currently, 1.91 billion of smartphones is used worldwide, with estimated increase of 2.56 billion of smartphones in 2018 (statista.com, 2015). According to Kennet, K., (2014), at present there are no studies (except their own) dealing with the burden of the neck when bending over, for example when using smartphones, therefore it is very difficult to predict the impact on the health of individuals and populations.

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ECONOMIC BURDEN OF ANTIDIABETIC TREATMENT IN SLOVAKIA

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ABSTRACT

Diabetes mellitus is serious public health issue and enourmous economic burden for health care systems. We evaluated the consumption of different forms of insulins from insurance companies case reports during January – December 2014. our sample consists of 197,544 patients. The total cost including all types of antidiabetic drugs (OADs +insulins) exceeded 42 MIO €. It represents almost 14% out of total direct costs associated with diabetes treatment in Slovakia during 2014. Total expenditures of insulins exceeded 23 MIO € (according to IMS 25 MIO €). Cost of insulins represents 7,44% of total cost.

INTRODUCTION

Diabetes mellitus is important public health issue and also increasing economic problem for healthcare system. For decades, clinical and public health recommendations have advised overweight and obese adults to eat more healthfully, adopt regular physical activity, and lose weight. Unfortunately, such advice unaccompanied by ongoing support is rarely sufficient to enable the adoption of healthier behaviors (7). We have several recommendations for healthcare systems and community organizations based on systematic reviews that evaluated available evidence for the effectiveness and cost-effectiveness of combined diet and physical activity promotion programs (8,9). Evidence suggests that programs that achieve a mean weight loss at 1 year of just 2.5% confer a 60% reduction in diabetes development at 6 years, with approximately one half of patients reverting to normal glucose levels (7,8). Programs based on the U.S. Diabetes Prevention Program (DPP) or Finnish Diabetes Prevention Study interventions yielded a 2-fold greater weight loss (mean, 3.0% [95% CI, 1.9% to 4.1%]) than less structured approaches (7,8). Although programs adapted from the DPP are generally considered "resource-intensive," their median cost was only $424 per person, or approximately 25% of that of the original DPP lifestyle intervention (7,9). Alas, if every overweight or obese American adult participated in such a program, the total bill would approach $71 billion ($424 times 168 million people), which raises important questions for stakeholders. We evaluated local direct costs associated with diabetes treatment with key focus on insulins. We also tried to put our local costs into context with other EU countries where we found similar data. Direct costs of antidiabetic therapy *(OADs + insulins)* reached 42.129.275 € in 2014, which represents 13,53 % from total direct cost of diabetes.

METHODS

We searched available case reports from insurance companies that represented year 2014. We evaluated the consumption of different forms of insulins from volume and units perspective. The population was divided by age and sex.

RESULTS

The total group consist of 220 319 patients. The study population consisted of 599 male patients younger than 18 years old and 99.765 male patients older than 18. Female patients under 18 were 508 and female patients over 18 were 119.447. The total cost including all types antidiabetic drugs were 42.129.275 € in 2014. We divided these costs into following subgroups: human insulin 5.897.005 €; insulin lispro 3.130.574 €; insulin aspartat 4.733.236 €; insulin glulyzine 1.480.411 €; insulin glargin 5.560.647 €; insulin detemir 2.271.107 €; insulin deglutec 42.609 €. Total cost of insulins was 23.115.589 €. Average cost per 1 diabetic patient in 2014 was 213 EUR.

CONCLUSION

We have more than 340.000 patients diagnosed with diabetes in Slovakia (2). Average cost of illness for treatment of a single patient in Slovakia was in 2014 1573 € (4). Expected direct total costs of diabetes were in Slovakia in 2014 at the level of 534.820.000 € (los productivity costs not included). Direct costs of antidiabetic therapy (OADs +insulins) reached 42.129.275 € in 2014, which represents 13,53 % from total direct cost of diabetes. Insulins – as key part of diabetes treatment (type I and also type II in selected cases) created 6.67 % (23.115.589 x 100 ÷ 1573 x 220.319) from total costs on diabetes. We wanted to put diabetes medications as a fraction of total diabetes direct costs into perspective with other EU countries where in France it is 6,2 %; in Italy 6,2 %; in UK 7,5 %; in Spain 10,5%; and in Germany 20% (5). The number of patients treated only with diet and lifestyle is unfortunatelly decreasing and the number of patients treated with drugs and inzulinotherapy is increasing (54,1% of patients treated with diet in 1988; 50.1% patients on inzulinotherapy) (1,2,3). This is definitely key public health issue and opportunity for futher preventive and teaching programs. According to National Centrum of Health Care Information in Slovakia - 1441.4 patients /100.000 inhabitants were treated by the diet and 1628.0 by insulin in year 2011 During year 2012: 71 469 people (31 914 men and 39 555 women) were treated only by a diet (2). 171 398 people (78 726 men and 92 672 women) were treated by oral antidiabetic drugs. 97 376 people (45 772 men and 51 604 women) were treated with insulins. This represents 21% of patients treated by diet versus 78% of patients treated with antidiabetic drugs (OADs + insulins).Very important is diagnosing of pre-diabetes and frank diabetes (a fasting blood glucose test, an oral glucose tolerance test, a hemoglobin A1C blood test). If the screening is positive we have to find appropriate ways to encourage lifestyle management and treatment of prediabetes. These recommendations could prevent or postpone the onset of treatment. Prevention long term activities focused on chronical diseases should be top public health priority.

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ARE REFUGEES FOR US A THREAT OR AN OPPORTUNITY? SOME HEALTH AND SOCIAL ASPECTS FROM THE PERSPECTIVE OF INDIVIDUALS

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ARE REFUGEES FOR US A THREAT OR AN OPPORTUNITY? SOME HEALTH AND SOCIAL ASPECTS FROM THE PERSPECTIVE OF INDIVIDUALS

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ABSTRACT

Introduction: *Since the spring of 2015, hundreds of thousands of refugees have been pouring into Europe. They have been mainly coming from countries that have been destroyed by civil wars. However many have joined the waves of refugees from countries of Africa where there have violent tribal conflicts. Those from these countries have lost their abilities to sustain themselves and their families. Syria and Iraq are countries with high social and hygiene standards, with a high level of health. People there are not dangerous for us, the risky are rather those who in recent weeks have begun arriving in the second wave - refugees from Bangladesh, Pakistan, Afghanistan and other Eastern countries.*

The team from St. Elisabeth University worked for the refugees in Hungary and is now working for them in Slovenia. Until now, the refugee routes have not been going through Slovakia. Diseases that we have dealt with in about 10 percent of the refugees have been minor injuries and routine respiratory infections. These have been the same kind of common diseases as in our own population - hypertension, diabetes, coronary artery disease, gastrointestinal diseases, depression. 1 percent have been seriously ill and could die without our help. In addition to our statistics we did a qualitative research of the opinions of Slovak citizens about refugees.

Methods*: We did our qualitative research in Slovakia during the months of July through October 2015. The research question was: What kind of attitude do the people of Slovakia have toward the refugees? We used content analysis of media articles, television reports and responses to social networks as our method to measure. We have made the first-instance coding of content issues that were occurring in the text.*

Results*: We took the content categories and then analyzed them. The categories that occurred in the texts were put into negative and the positive categories. The negative categories were: fear, hostility, envy, fear of the impact of a new culture, Islamization, unwillingness to share, closeness, focus on their own problems, hatred, and rejection of the government to participate in solutions. There was also an opinion that Slovakia had nothing to do with the causes of the problem. Therefore, why should it be obligated to participate in solution? The positive categories were: willingness to help, willingness to share, targeting the essential themes of Christianity as instructed by Jesus, personal commitment in aid, contributing toward financial aid, personal voluntary aid, fight against xenophobia and hatred, understanding and feeling empathy to the suffering of the refugees.*

Discussion: *It turns out that the most prevailing opinions were the negative ones. This included negative perceptions of refugees, fear of Islamization, fear of a new culture, fear that terrorists were hiding among the refugees, fear of threats to economic security. Refugees from the Middle East and Africa were received favorably only in a minority of cases. We learned that the attitudes were favorable when people became personally involved and went outside of Slovakia to Hungary to help. Many responded by giving financially toward charities that needed money. We picked up the views of intellectuals who urged Slovak citizens to overcome fear and look for ways to assist refugees. They frequently expressed that we did not want to be seen as a nation of xenophobic, but people who, if faced with the suffering of others that we reach out and help. This desire to be a tolerant count went against the general opinion that is communicated by leading politicians*

INTRODUCTION

Since the spring of 2015 the waves of refugees to Europe have continued to grow. It is a situation in which we have not been accustomed to in our lives. Whether we understand it or not, whether we agree with it or not, whether we did protective measures or not, refugees are flocking into Europe in hundreds of thousands. Their reasons for coming to Europe is to live in a safer world where they do not fear for their lives. They have left their home countries because of the tortures, rapes and mass murders caused by Islamic extremism. Or they have lost hope that the civil wars in their countries will end and that they can again live in safety. Some have joined the refugees because their possibilities to feed their children have disappeared because of tribal wars.

The political reactions in Europe to the increasing flow of desperate immigrants have been varying. Some of the political reactions in the countries where the refugees have been traveling through, or who have been border countries to the Schengen Agreement have been less optimal. Some others have reacted according to their positive or negative historical experiences with refugees.

The opinions of citizens of Slovakia are often influenced by kind of information that people get about refugees. The official opinion of government is strongly against refugees and this opinion is being used especially during the few months before elections as a main motive of the campaign. The proclamations that come from the government spread fear and uncertainty. They use arguments to explain that we, Slovaks are not responsible for the crisis in Syria. We are reminded that refugees can bring new diseases to our country. We are told that we already have too many unemployed people and refugees would add an additional burden to our social system. They tell us that one can never know whether the Muslim refugee who would live next door would not be dangerous and want to kill us. And so on. The fact is that in Slovakia there are only few tents of refugees who are being accommodated for. And they are only here as a temporary help to our neighbor Austria. There are about 100 other refugees in Slovakia who have been extremely carefully selected by our government officials. And they are in Slovakia only due to the requests of Slovak charity workers who want to help Syrian or Iraqi Christians from the war. But only Christians. Not Muslims.

No refugee routes go across Slovakian land. Neighboring countries such as Hungary and Austria had to face hundreds of thousands of refugees since this last spring.

Our helping team from St. Elisabeth University, who worked first in Hungary and now in Slovenia has gained deep personal experiences with refugees. In these countries refugees come mainly from Syria, north Iraq, Afghanistan, but some also from Bangladesh, Pakistan and other countries from the Middle East. The most people passing through the Balkans and heading to Western Europe are primarily healthy. The aging and sick have remained in the camps of countries that border Syria. Those who are sick would probably not handle such a journey. The frequency of a disease to which we met, was substantially similar to what we know of.

Syria and Iraq are countries with high social and hygienic standards, with a high level of health. Slovakia even cooperated for many years on creating health policy in these countries. People there are not dangerous for us, the risky are rather those who in recent weeks have begun arriving in the second wave - refugees from Bangladesh, Pakistan, Afghanistan and other Eastern countries.

What diseases have patients in severe makeshift conditions been diagnosed with?

Until recently, there were common diseases as in our population - hypertension, diabetes, coronary artery disease, gastrointestinal diseases, depression was much. We reveal any epidemic, but not a single case of tuberculosis (KRČMÉRY, 2015 c.)

According to the statistics which we lead we estimate among all the people who were coming every day in approximately 5-6 groups of 3,000 to 4,000 about 10% have had common illnesses. About one percent of them have been seriously ill.

We were there particularly because of this one percent who are seriously ill, who could possibly die without medical assistance. We administered first medical help to people with heart attacks, asthma attacks, pneumonia,

diabetic coma, cardiac arrests, as well as nascent women. At the border station we helped with nine births per month. We also helped young children who were suffering with very severe pneumonia (KRČMÉRY, 2015 c.).

We learned that those who worked with relief agencies from Hungary and Slovenia as well as those from Slovakia, Czech Republic, and Germany, those who had personal contact with the refugees held much more compassionate opinions than those from their countries who only relied upon the media or social networks for their information. Especially in Slovakia the social networks present mostly negative opinions, sometimes bordering to hatred. The voices that reflecting compassion and rejection of hatred are in a small minority. Almost nobody tries to understand traumatizing experiences of refugees that are really in danger of life not only at their country but also many times on the road.

In our paper we decided to carry out this qualitative research about opinions toward refugees in Slovakia as they were reported in the media during the months from July to October 2015

METHODS

The main research question was: What kind of attitudes are there towards refugees by citizens of Slovakia?

The method of research was qualitative research of reviews published in the Slovak press, television and the Internet as well as the responses of readers of the social networks on internet. We also conducted interviews with people who live in our neighborhoods who were willing to discuss this issue. We did everyday research perspectives from 1 July to 15 October 2015. We received 1-3 posts a day in feedback and a multiple number of feedback in the discussions.

The texts then underwent content analysis and coding of issues, which were then divided into categories. These then were analyzed in detail and compared.

RESULTS

The result of this research are semantic categories which we analyzed in the study texts and opinions. These are the categories: (Table 1)

Fear of the refugees, hostility toward the refugees, envy that the refugees would get more government assistance than what Slovaks earn, fear of the impact of a new culture, Islamization, unwillingness to share because of the feeling that we, ourselves are poor, closed feelings toward outsiders, focusing on our own feeling that we ourselves have too many of our own problems, hatred toward people from Islamic countries, rejection by the government to participate in solutions. Finally there was the feeling that since Slovakia had nothing to do with causing the problems of refugees, why should anyone feel responsible to sacrifice something in order to help solve it.

On the other hand, there are positive categories:

A benevolent spirit to help those in need, a willingness to share what resources that they had which could help the refugees, targeting the essential themes of Christianity as taught by Jesus to feed and clothe the hungry and naked, making a personal commitment to help without being forced by some outside institution, providing money to support charities who work with the refugees, personally going to the places where the refugees were traveling to help, responding to those who were propagating hatred, expressing understanding and empathy to the suffering of the refugees, and offering their own personal commitment to offer their own home as refuge if possible.

It must be said that the negative categories were more prevalent in frequency over the positive. Those people who responded positively tended to speak on behalf of known non-governmental organizations who have a history of helping needy people. Some well-educated and socially conscious people participated in the commentary. Foreigners living in Slovakia responded favorably. Interestingly, was how few positive responses that came from clergy of the Catholic Church in particular. Considering the pope's call for churches to help the refugees, only a handful of clergy responded favorably.

DISCUSSION

Most of the respondents' reactions manifested rejection and fear. They are citing grounds such as

"Nearly all of them are Muslims, and that means terrorists arrive in Europe, to hurt us. They will build their mosques everywhere, there will be lot of them here and so they influence our culture. We must fight for Europe to remain a Christian continent. "

Teams from our University of °St. Elizabeth responded to the refugee crisis. Although our country is not along the refugee route, (yet) we sent a team of doctors and social workers to the sites where the assistance is overwhelmed by the numbers of refugees. We joined with teams of humanitarian workers along the Hungarian and Serbian border, Roszke, and at Hegyenshalom on the Hungarian and Austrian border (RADKOVÁ, 2015). In our experience we saw many young families with small children, originating mainly from Syria but also in Iraq. Sometimes Kurds from Iraq and a few other refugees from other Middle East countries were in these groups. Sometimes we saw that young families came with older relatives. But that was rare. We wanted to know this. Why they are coming now when the war in Syria has been going five years? We found that refugees do not come directly from Syria, but from the refugee camps in Lebanon, Jordan and Turkey. They had remained in those refugee camps for years. But they had collectively lost hope that they could return safely to their country.

We have seen people coming with their heads down, on foot, exhausted, hungry, thirsty, with their ragged feet, poorly dressed for the cooler weather of central and norther Europe (KRČMÉRY, V., ĎURÍČEK, A. 2015 b). Children went resignedly, with blank expressions, with their parents, not complaining. The youngest children were carried on the shoulders of fathers or in their mother‘s arms. At each transfer, whether on a cruise from Turkey or ride down the road there were ,transporters who were charging those fees that were ten times higher prices as they would have charged before the crisis. At the places where we helped them they had already traveled more than 3000 kilometers.

We observed two conflicting thoughts in Hungary. The first was strong public opposition against the refugees and hatred. This was massively massaged by media which was heavily influenced by the Hungarian government. But then when people saw refugees by their own eyes and recognized their suffering, they began to help them as they were able. They brought clothes, shoes, food, tents, sleeping bags, toiletries. Some volunteers from the surrounding Hungarian villages worked for days to months. Many volunteers came from neighboring countries such as the Czech Republic, Slovakia, Austria, Germany (GASPEROVÁ, 2015). Some came under the umbrella of NGOs, but many also individually provided their own cars and their own money.

There was a high response and fear that Islam will settle in the countries of Europe and prevail over Christianity. They imagined refugees building mosques everywhere. And they felt that by refusing to feed and clothe the refugees, they would, thus, save Christianity in Europe. At least they felt that we could preserve the external form of the church and save our countries from mosques. To this we must ask whether the deeper calling of Christians is lost. We remember the parable of the Good Samaritan. A man who was not of the proper faith, who fed the hungry, gave drink the thirsty and carried a man to safe refuge and medical treatment. Jesus said to feed the hungry and clothe the naked; he did not say “but first, make sure that they hold the same religious beliefs as you”; “but first, make sure they deserve it”; “but first, make sure they will appreciate it and will turn from their erring ways.” No. He did not attach any qualifiers to our responsibility to help those in need (HUŽOVIČOVÁ, 2015). How will Christianity look in Europe when it feels that it is preserving its faith when it refused to rescue the persecuted and in fear of their lives?

„The EU will pay to these refugees, 500, 600, 1,000 euros and we don’t earn that much! “

Imagined envy that the refugees will live too well. It is true that in Slovakia there are many families living modestly and struggling to stay out of poverty. Yet, our country is among those who have living standards among the top 10% of the most advanced countries in the world. We live in a stable society where nearly all of us knows we will sleep tonight. We are not worried that we will not have anything to eat for our next meal. We do not worry about where we will get our next water. When we get sick, we can get medical help. Our children have a school routine. For most people in the world such an abundance is not within their reach. Sadly, though, we don’t perceive

our abundance and so we don't feel that we have anything to share with those who are risking death on the roads from hunger and cold.

"Refugees can bring dangerous infections and new diseases to which we have no experience in Slovakia."

Our helping team from St. Elisabeth University, who worked first in Hungary and now in Slovenia have extensive personal experiences with refugees. In these countries refugees come mainly from Syria, north Iraq, Afghanistan, but some also from Bangladesh, Pakistan and other countries from that part of the world. The most people passing through the Balkans and heading to Western Europe are primarily healthy. The frequency of a disease to which we met, was substantially similar to what we know of our citizens.

Syria and Iraq are countries with high social and hygiene standards, with a high level of health. Slovakia even cooperated for many years on creating health policy in these countries. People there are not dangerous for us, the risky are rather those who in recent weeks have begun arriving in the second wave - refugees from Bangladesh, Pakistan, Afghanistan and other Eastern countries.

„They are different from us, have completely different culture and customs. We will have to adapt to them".

We often forget that even our nation is made up of different people, Slovaks, Hungarians, Czechs, Germans, Ukrainians, Romanies... We forget that we ourselves are a mix of different peoples and cultures that were previously shifted through our territory and left us their genes (HUŽOVIČOVÁ, 2015). Not all of us are wise, not all of us are decent, not all of us are grateful. The difference of behavior, appearance, and thinking is natural for the human race. But we still help each other and cooperate together.

„We are afraid that they will be too different. There will be terrorists among them. They will not want to adapt to our way of life. We will all be poorer because of them. "

It is known that the Slovaks in the past during the Second World War hid many persecuted Jews even at the cost of jeopardizing or losing their lives. Slovaks have perhaps the highest number of awards from the Israeli organization, Righteous Among the Nations for their actions. Slovaks risked their lives because their help was officially banned. If the Germans discovered that Slovaks were helping others, the Slovaks who gave help were shot or sent to concentration camps. 600 Jewish children from Slovakia were saved by a British hero, Sir Winton. They were placed into families in Britain who did not know what kind of children they would save. Europe now faces its historical chance to focus its attention not on GDP growth and increasing its own well-being, but to the highest values of humanity. We can help many, many people who left everything behind in order to save their lives. And after losing hope in the refugee camps they come seeking help and hope in Christian Europe. It is up to us how history will witness and look back at us in the future. Are we xenophobic people with hardened hearts? Do we fear that we cannot share with those who need it? Or, are we people who take the historic opportunity to stop our world view of consumption for ourselves in order to share our abundance with those who have lost everything.

CONCLUSION

Today, Europe is facing an historic challenge. The challenge whether we are able to handle in a humanitarian way, the rush of hundreds of thousands of refugees (KRČMÉRY, ĎURÍČEK, 2015 a.). As our research shows, the majority of Slovaks hold a closed door attitude to refugees. It appeared that the media influenced them with modified information that reinforced their fears. The media and comments from social media fueled their rejection, fear and hatred to the refugees. This was so even when there are no refugees who are passing through our country. The minority who shared their opinions felt that the refugees need help on his sorrowful journey to Europe. Not surprisingly the refugees go to the countries with the most friendly asylum politics. We observed an interesting argument from many Slovaks, who did not consider themselves as Christians. They argue that helping Muslim refugees would be a threat to Christian values of our society. They imagine too many mosques that would be built in our country. They forget that Christianity, according its founder, Jesus Christ, is to assist to travelers, protect the poor, feed the hungry, give drink to thirsty, and take care of the pilgrims. The Christian character of Europe has long since been overwhelmed by consumerism and self-centered pursuit of things. We have a historical opportunity return the Christian character of Europe, to return to our roots. How will we use this opportunity?

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Table. 1 Negative and positive categories

Negative Categories	Positive Categories
Fear of the refugees	Benevolent spirit to help those in need
Hostility toward the refugees	Willingness to share what resources that they had which could help the refugees
Envy that the refugees would get more government assistance than what Slovaks earn,	Targeting the essential themes of Christianity as taught by Jesus to feed and clothe the hungry and naked
Fear of the impact of a new culture	Making a personal commitment to help without being forced by some outside institution
Islamization,	Providing money to support charities who work with the refugees
Unwillingness to share because of the feeling that we, ourselves are poor	Personally going to the places where the refugees were traveling to help,
Closed feelings toward outsiders	Responding to those who were propagating hatred,
Focusing on our own feeling that we ourselves have too many of our own problem,	Expressing understanding and empathy to the suffering of the refugees,
Hatred toward people from Islamic countries	Offering their own personal commitment to offer their own home as refuge if possible.

Rejection by the government to participate in solutions	
Feeling that since Slovakia had nothing to do with causing the problems of refugees, why should anyone feel responsible to sacrifice something in order to help solve it.	
Fear of new diseases	

SCREENING FOR CYSTIC FIBROSIS AND SUBSEQUENT HEALTHCARE MANAGEMENT FROM THE PERSPECTIVE OF PUBLIC HEALTH: THE FIRST RESULTS OF A NATION-WIDE STUDY IN SLOVAKIA

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ABSTRACT

Our work aims to map and assess the results of the national nation-wide screening for cystic fibrosis. This study is based on the notion that implemented screening CF brings the clear benefit to the patient. The basic hypothesis is the assumption that screening for CF by its very early diagnosis detection and early initiation of a complex therapy can positively influence the further development of children with CF. The latest international studies have revealed facts that point to a reduced mortality and morbidity in which newborn screening was conducted. The aim of our study was to confirm or deny these data within the Slovak Republic. We compared two groups of patients. Those who had the CF newborn screening made in the years 2009-2013, compared with a second group. The other group comprised patients who were diagnosed only by clinical changes later in life. We monitored in detail the basic parameters of nutritional status, quality of life, morbidity rate, culture colonization of the airways and other parameters. As we followed the patients for only a short period (up to one year of life) we can not exactly comment on the long-term prognosis. However, statistical conclusions clearly show the significant benefits of establishing a national nationwide screening of cystic fibrosis. Substantial differences in weight and other nutritional indicators with a subsequent better nutritional status favor the group of patients in which the newborn screening for CF was conducted.

INTRODUCTION

Cystic fibrosis (CF) is a serious hereditary (autosomal recessive), multi-organ disease, which significantly influences the length and quality of life. It mainly affects the respiratory and gastrointestinal tract. Long-term productive cough, phlegm, sinobronchial syndrome, headache, nasal obstruction, impaired fertility, failure to thrive is caused by a problem at the cellular level. CF essence lies in the mutation of the gene on the long arm of chromosome 7. Understanding of the nature of disease and genetic context, speeding up diagnostics, comprehensive care improvements, new drugs, individualized treatment aimed at particular mutation enables prolonging of patients´ survival. This change in thinking and understanding of the disease has created a favorable climate for inclusion of the disease between screened and thus actively sought diseases in the population. Benefits of rapid diagnosis and effective treatment are shown to be predictors of survival, which has the secondary significant positive impact on public health.

METHODOLOGY

The aim of this work is to point out the differences in the care of CF patients before and after the introduction of nationwide screening worldwide and in Slovakia. Nationwide screening for serious hereditary diseases has the task of detecting the affected, even in the period when their disease is not clear, although it already causes irreversible changes in the body. From February1, 2009, as part of newborn screening in all newborns also CF is examined in Slovakia. Newborn screening for CF contributes to the early diagnosis and initiation of treatment, which significantly influences the growth and improvement in lung function. It reduces the number of pulmonary

exacerbations, subsequently prolonges survival and improves quality of life. Aims and objectives of the work is to map the clinical benefit for diagnosed patients in our conditions. The first objective was to determine whether newborn screening for CF will lead to better nutritional status of the patient. The second sub-objective was to determine whether neonatal screening for cystic fibrosis will lead to fewer infectious complications and the number of acute respiratory hospital admissions. To achieve the objectives, methods of statistical monitoring and subsequent statistical hypotheses testing were used. This is a retrospective study, the period of our follow-up was 10 years (2004-2013). The basis for collecting data was medical records of patients from various databases of CF centers for adults and children (3x paediatric, 3x center for adults from all over Slovakia). That motivates us to verified the benefits of newborn screening for CF. When processing the data, we worked with two types of random variables, i.e., quantitative and qualitative features. Quantitative characteristics were described using the arithmetic mean and standard deviation, or using the median. Quality features were described by percentage rate and median using statistical Mann-Whitney U test. Newborn screening for cystic fibrosis examined 329,738 newborns and classified 43 positive cases of the CF disease by the end of 2014 in Slovakia. It motivated us to verify in our conditions set goals regarding benefits of newborn screening for CF.

RESULTS

Our common aim and task is to compare different Slovak CF centers, improve work efficiency in improving the quality of life of CF community and then propose improvements. We compared two groups of patients. Those who had the CF neonatal screening made (screening group) from 2009 to 2013, compared with a second group. The second group comprised patients who were diagnosed only by clinical changes later in life, i.e., they come from the screening period prior to 2004-2008 (non-screening group). The goal was to describe in detail both groups of patients. We followed the basic parameters of nutritional status, quality of life, morbidity rate, culture colonization of the airways and other parameters. Our group consists of 88 patients who were positively diagnosed for a genetic disease 'cystic fibrosis' from the beginning of 2004 until the end of 2013. We followed one 10-year period, all patients that were 'newly' diagnosed for this time-determined period. Two groups of children were created: the first 'screening' group of 44 children, was later narrowed to 43 patients. The second 'non screening' group had 45 patients who were classified on the basis of a typical clinic. We followed accessible data able of objectivization in both study groups. We were only interested in early childhood in the first year of life in both cases. Therefore, we focused on the monitoring of the weight and length of the delivery of the baby, on the same parameters in the first year of life; on the values of sweat test, genetic information /types of mutations in CFTR gene/, swab culture /colonization/ and frequency of hospitalization in the first year of life for respiratory exacerbation. We also assessed the patient's age at time of diagnosis. From those data, we carried out calculations and then draw conclusions and postulates.

STATISTICAL METHODS USED

Since 2009, also newborn screening for cystic fibrosis (CF) was introduced nation-wide, which drew us nearer to pan-European standards. Newborn screening for CF significantly contributes to the early diagnostics and initiation of treatment. Thereby, it significantly influences the growth, improves lung function, reduces the number of days of hospitalization, reduces the number of pulmonary exacerbations and prolongs survival.

According to our results, we can assert with greater than 99% probability that the average height of children at birth is statistically significantly ($p = 0.008$) higher in 'non-screening' group of patients. And also despite to that, we confirmed with more than 90% probability that the average height of children aged 12 months was statistically significantly ($p = 0:08$) higher in the 'screening' group of patients. This means that children from the first group ('the screening ones') generally grow better and catch up the deficit from the time of birth, and got ahead of the second group. Further, based on our results we can claim with over 99% probability that the average weight of children at 12 months is statistically significantly ($p < 0.0001$) higher in the 'screening' group of patients. At children´s birth, the difference in average weight in the first and second group of patients was not confirmed. Another nutritional parameter with great informative value we studied was body mass index. With more than 99% probability we can claim that the average BMI of children aged 12 months is statistically significantly ($p = 0.006$) higher in the 'screening' group of patients. Likewise, the difference in mean BMI of children at birth in the first and second group of patients was not confirmed. Also, the average BMI of children aged 12 months was statistically significantly ($p = 0.02$) higher in the 'screening' group. These results clearly confirm that newborn screening for cystic fibrosis results in improved nutritional status of the patient.

The genetic composition of our first and second group was very similar. In the first year of life we do not see any significant differences in terms of the amounts of swab culture, variety or species of representation of individual pathogens. The frequency of incidence in both groups was comparable, from which the frequency of hospitalizations derives. An important detail is that up to 9 patients from the 'screening' group was not ever hospitalized in the first year of life for respiratory infection. In the 'non-screening group' it was only two patients for the same period. We were unable to clearly confirm whether newborn screening for cystic fibrosis will lead to fewer infectious complications and the number of acute respiratory hospitalizations for the monitored period. Parameter where we see the big difference is the time that elapsed until the CF diagnosis was found. The average time of diagnosis making in the 'screening' group was 3.5 months; in the 'non-screening' group it was up to 66 months. An extreme was the patient in whom the CF disease was found at the age of 409 months.

Table: The whole group of patients, the whole set of girls, all boys file, statistical evaluation.

all (N=88)			mean ± standard deviation	median	minimum - maximum	p
newborn	hight [cm]	screening	48.86±2.21	49	36-55	0.008
		nonscreening	49.76±3.41	50		
	weight [g]	screening	3192±371	3200	950-4300	n.s.
		nonscreening	3285±522	3300		
	BMI [kg/m2]	screening	13.39±1.60	13.23	7.33-20.69	n.s.
		nonscreening	13.23±1.87	13.07		
one year old	hight [cm]	screening	77.00±4.38	78	69-94	0.08
		nonscreening	76.37±5.83	75		
	weight [g]	screening	8575±1071	8500	6700-11600	<0.0001
		nonscreening	7706±919	7400		
	BMI [kg/m2]	screening	14.50±1.79	14.28	8.49-19.41	0.006
		nonscreening	13.31±1.83	13.40		

girls (N=51)			mean ± standard deviation	median	minimum - maximum	p
newborn	hight [cm]	screening	49.00±2.04	49	40-55	n.s.
		nonscreening	49.57±3.09	50		
	weight [g]	screening	3167±396	3180	2300-4150	0.08
		nonscreening	3334±340	3300		
	BMI [kg/m2]	screening	13.17±1.32	13.00	10.87-20.69	n.s.
		nonscreening	13.63±1.78	13.46		
one year old	hight [cm]	screening	76.70±4.35	78	69-94	n.s.
		nonscreening	75.78±5.77	75		
	weight [g]	screening	8462±956	8450	6700-10920	<0.0001
		nonscreening	7604±744	7400		
	BMI [kg/m2]	screening	14.43±1.89	14.22	8.49-19.41	n.s.
		nonscreening	13.39±1.82	13.51		

boys (N=37)			mean ± standard deviation	median	minimum - maximum	p
newborn	hight [cm]	screening	48.60±2.56	49	36-55	0.008
		nonscreening	50.15±3.91	50		
	weight [g]	screening	3238±328	3300	950-4300	n.s.

		nonscreening	3187±681	3300		
	BMI [kg/m2]	screening	13.79±2.01	13.24	7.33-20.18	n.s.
		nonscreening	12.45±1.63	12.89		
one year old	hight [cm]	screening	77.53±4.55	78	69-90	0.08
		nonscreening	77.05±5.98	75		
	weight [g]	screening	8787±1268	8500	6800-11600	<0.0001
		nonscreening	7798±1112	7500		
	BMI [kg/m2]	screening	14.62±1.66	15.1	9.69-17.55	0.006
		nonscreening	13.23±1.88	13.07		

CONCLUSION

Cystic fibrosis is a rare, but a very serious progressive genetic disease shortening the life of the affected. In recent years, we have managed to centralize diagnostics and treatment of patients with CF. This creates a presumption of quality care. Nationwide screening for CF brings the patient early diagnosis and immediately initiated comprehensive treatment. It positively affects the further development of children with CF. The financial resources for the implementation of the entire operation of newborn screening for cystic fibrosis is reflected in a significant improvement in clinical status of patients. Disease progression depends critically on nutritional status and the number of infectious complications, individual pathogen colonization, care of neighborhood and family. Nowadays, when we have the opportunity to affect the very nature of the disease (control of the function of CFTR protein) it is extremely important for patients to be in excellent condition. Also this work highlights the direct link between CF screening and subsequent improved clinical status. The results of our work show the benefits of screening, significantly better growth and weight curves in the group of screening patients.

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HEALTH AND PUBLIC HEALTH ADMINISTRATION VIEW ON THE CAUSES OF CHILD MORTALITY AND MORBIDITY IN THE SLOVAK REPUBLIC

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HEALTH AND PUBLIC HEALTH ADMINISTRATION VIEW ON THE CAUSES OF CHILD MORTALITY AND MORBIDITY IN THE SLOVAK REPUBLIC

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ABSTRACT

The current lifestyle brings more and more patients with craniocerebral injuries. At the same time, the number of patients with cerebrovascular diseases increases, as the survival rate of patients with congenital developmental defects and various metabolic and genetic diseases has improved. Under the age of one year, complications of the perinatal period are the leading cause of mortality among boys and girls. At the age of one year to 24 years, injuries are the leading cause of mortality among boys and young men. Since 2006, among girls aged 1-4 years, injuries have dropped to the fourth place as the cause of death, congenital developmental defects and chromosomal anomalies have ascended to the first place, respiratory diseases are on the second place and diseases of the central nervous system are on the third place.

INTRODUCTION

The current lifestyle brings more and more patients with craniocerebral injuries. At the same time, the number of patients with cerebrovascular diseases increases, as the survival rate of patients with congenital developmental defects and various metabolic and genetic diseases has improved.

In many cases, the acute insult to the brain has lifelong effects, therefore, in addition to the reduction of mortality, also morbidity of the patients needs to be minimized.

The key in reducing the morbidity of patients with acute brain injury is personalized medical care. In the Slovak Republic, there is only a database of patients who died in connection with brain injuries. Also laws which order that children in passenger cars must be restrained, and progressive public education on the use of protective equipment in sports, have a part in reducing the morbidity of patients after craniocerebral injuries.

IMPACT OF ACUTE BRAIN INJURIES ON MORBIDITY AND MORTALITY OF THE CHILD POPULATION IN THE SLOVAK REPUBLIC

Mortality of the Child Population

According to the National Health Information Centre (NHIC) of the Slovak Republic, in the years 1996 - 2000, there were 1,378 deaths of children and young people under the age of 25 years, in the years 2001 – 2005 1,066 deaths and in the years 2006 – 2010 924 deaths of children and young people in the same age range (Table 1).

	Under 1 year		**1 – 4 years**		**5 – 14 years**		**15 – 24 years**	
	men	women	men	women	men	women	men	women
1996 - 2000	288	227	67	47	115	74	426	134
2001 - 2005	206	168	48	39	83	51	348	123
2005 - 2010	198	145	40	32	63	42	311	93

Table 1 The number of deaths of boys and girls under the age of 1 year, 1-4 years, 5-14 years 15 – 24 years in the period of 1996 - 2000, 2001 - 2005, 2005 – 2010 (processed according to the Statistical Office SR/ NHIC)

Under the age of one year, complications of the perinatal period are the leading cause of mortality in both sexes. According to NHIC data, injuries are not the cause of death under the age of one year.

At the age of one year to 24 years injuries are the leading cause of mortality among boys and young men, the amount of fatalities in the age between fifteen to 24 years rises sharply (Chart 1).

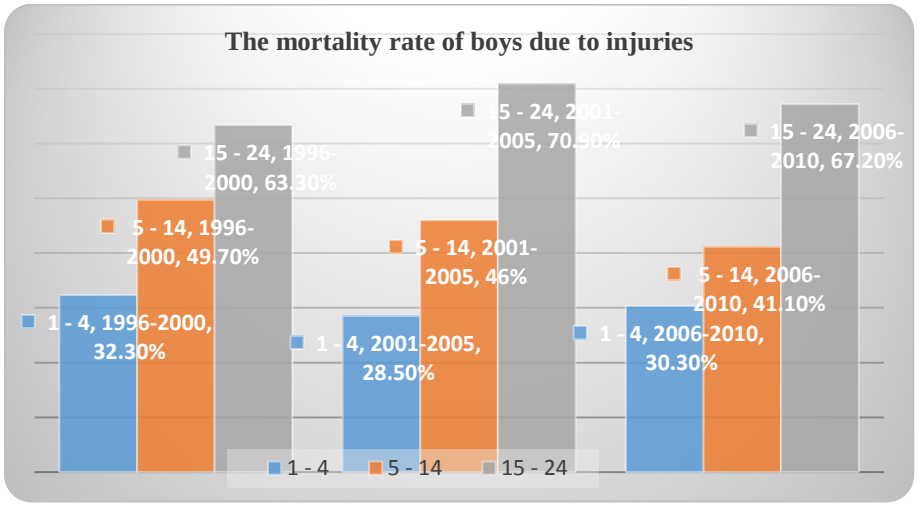

Chart 1 Mortality rate of boys due to injuries of all deaths at the age 1-4 years, 5-14 years, 15–24 years in the period 1996-2000, 2001-2005, 2005-2010 (processed according to the Statistical Office SR/ NHIC)

By the end of 2005, injuries were the major cause of death among girls at the age 1-24 years (Chart 2).

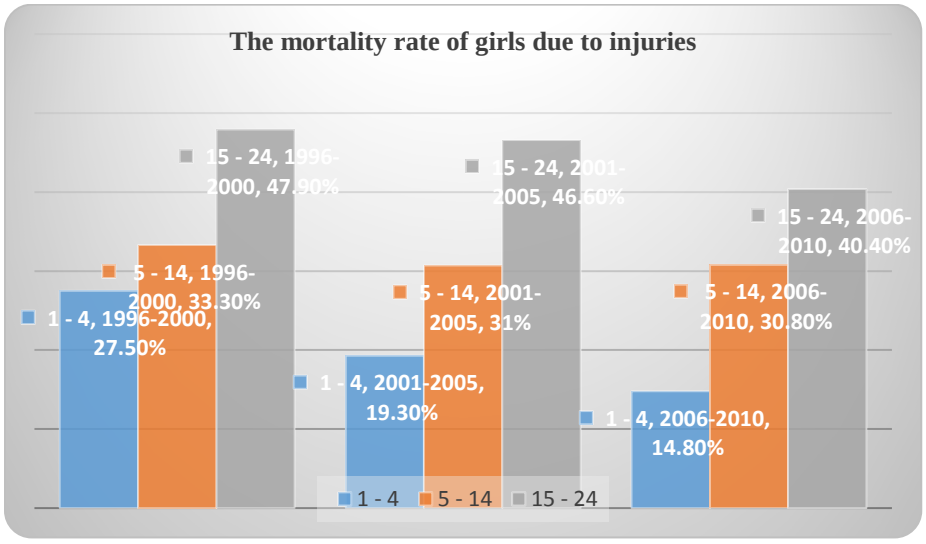

Chart 2 Mortality rate of girls due to injuries of all deaths at the age 1-4 years, 5-14 years, 15–24 years in the period 1996-2000, 2001-2005, 2005-2010 (processed according to the Statistical Office SR/ NHIC)

Since 2006, among girls aged 1-4 years, injuries have dropped to the fourth place as the cause of death, congenital developmental defects and chromosomal anomalies have ascended to the first place, respiratory diseases are on the second place and diseases of the central nervous system are on the third place (Chart 3). From 5 to 24 years it is similar to the trend in previous years, and as the boy's population. Thus, the injuries are the major cause of morbidity also in girls, but the number of fatal accidents is lower than in boys (Baraková 2012).

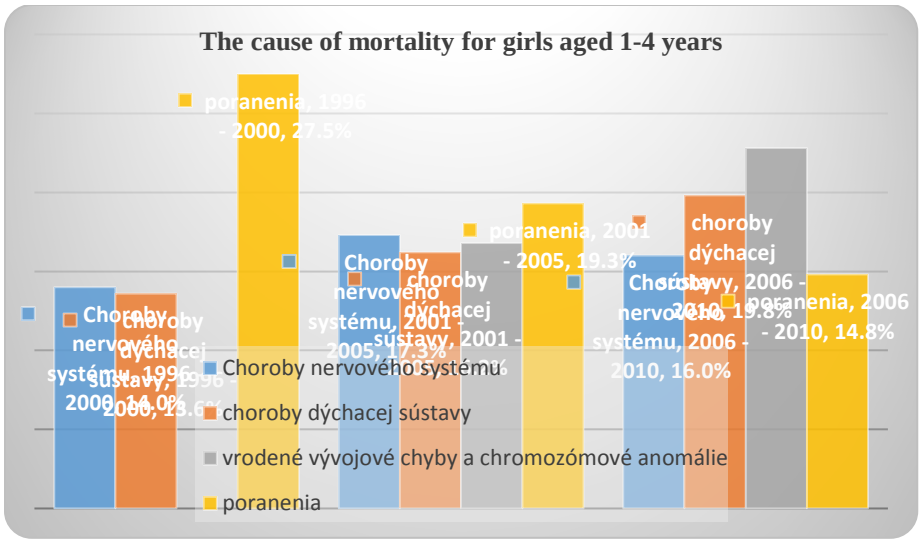

Chart 3 The cause of mortality for girls aged 1-4 years in the period 1996-2000, 2001- 2005, 2005–2010 (processed according to the Statistical Office SR/ NHIC)

Legend: Diseases of the central nervous system
Respiratory diseases
Congenital developmental diseases and chromosomal anomalies
Injuries

Craniocerebral Injuries

The primary, most common forms of brain damage are injuries. They are currently a serious pan-European problem. According to the World Health Organization, they are the third leading cause of death in Europe. In the United States, brain injuries are considered a „silent epidemic“. The WHO and the World Bank issued a joint report entitled "The Global Burden of Disease" and expect that in 2020 road traffic injuries will become the third largest disease burden.

In the years 1998 – 2009, approximately 12,800 patients aged 0 – 18 years each year were hospitalized for trauma, and we can see the decrease in the number of hospitalized patients (in 1998 there were 14,132 patients, in 2007 12,772 patients and in 2009 only 11,623 patients). Of the total number of injured, head injuries accounted for 34.7% (in 1998) and 39% (in 2007). Data on the proportion of light injuries to more severe injuries and to deaths from all accidents are not available in the Slovak Republic, because non-fatal accidents are not systematically monitored. Exceptions are specific accidents, i.e. traffic accidents monitored under the Ministry of Interior (Department of Traffic Police of the Police Force) and school accidents monitored under the Ministry of Education (Baraková 2010). According to the recommendations of the World Health Organization, 2020 target is to reduce mortality and invalidity due to injuries in the population under 18 years by at least 50%.

Cerebrovascular Diseases

Cerebrovascular diseases (CVA) are another group of acute brain injury. In Slovakia, there are statistics of cerebrovascular diseases only in the adult population, so we do not have accurate data on the incidence of these diseases in children.

Compared to the adult population, the incidence of CVA in children can be considered relatively rare, although the incidence is rising in recent years. On the one hand, it is caused by the improvement and availability of diagnostic procedures (CT, MR) and, at the same time, longer survival of children with diseases, with frequent cerebrovascular complications such as congenital heart disease, thrombophilic states, vascular malformations and malignancy (Miklošková 2012).

The incidence of CVA diseases in children depends on the age of the child. The most numerous are the newborns, the incidence of which is between 25 - 30 per 100,000 or 1 - 2 per 300 – 4,000 live births (Golomb 2009). The incidence of ischemic stroke is highest in the first year of a child's life, hemorrhagic manifestation of CVA has the highest representation in adolescence, when it is mainly subarachnoid haemorrhage (Royal College 2004). Thrombosis of the cerebral veins and sinuses is even more rare, the estimate of its incidence is 0.67 per 100,000 children each year, with as high as 40 % in newborns (DeVeber 2001).

The incidence of cerebrovascular diseases is higher in boys (over 1.2 times) than girls, and in black children in which there is even 2-times higher incidence (Fullerton 2003).

The rise of the incidence of these diseases is associated with higher survival rate of children with other congenital disorders (Vestenická 2002). In the USA they belong to the tenth place in the cause of death of children, and their mortality rate is 6-20% with a 50% risk of permanent sequelae. It can be assumed that there is a similar trend in Slovakia and the incidence of cerebrovascular diseases is increasing.

Socio-Economic Impact of Brain Injury

From the perspective of public health it is not only important to reduce mortality in acute brain damage, but it is important to also focus on reducing morbidity. It should be borne in mind that the effects of an acute brain injury have an impact not only on the health of individuals and their opportunities for further work in society, but also on the entire society.

The economic losses of revenues of the affected during the acute phase, and then at the stage of recovery, is only a partial problem. Patients are often tetraplegic and their quality of life is significantly reduced (Šupínová, 2013). If they fall into invalidity their total dependence persists, which forces the relatives of working age to take over the care and become economically dependent on the society. Large financial losses for the decrease in labour productivity due to injury were, are and will be a problem for the society.

It follows that it is necessary to individualize therapeutic approaches, to the extent possible, to the needs of the patient and, in that way, to minimize the risk of complications in the provision of health care.

RECOMMENDATIONS FOR PRACTICE

In order to minimize the consequences of acute brain damage in healthy subjects and to increase the possibility of their further work in society, it is recommended for practice:

1. From the perspective of public health it is important, in acute brain injuries, not only reduce mortality but also morbidity.
2. To begin as soon as possible health care for paediatric patients with acute brain damage.
3. To provide health care for paediatric patients with acute brain injury in specialized healthcare facilities, which are able to provide a comprehensive diagnosis and follow-up medical care.
4. To make specialist health care for paediatric patients equally accessible to all patients.
5. Within the prehospital care, to transport paediatric patients with acute brain injury primarily to a specialized facility.
6. To implement the secondary transport of a paediatric patient to specialist department by a specialist paediatric transport team.
7. To lead the therapy of patients with acute brain injury, in the immediate period after insult, with the aim of minimizing possible neurologic deficit.
8. In the next period, to strictly individualize the patient´s therapy according to laboratory and clinical data.
9. Neurointensive care led more freely, which is subsequently fortified based on the developments of the neurological condition, includes a risk of insufficiently protective neurointensive care, which can mean, for the patient, critical neurological deficit with a high risk of disability.
10. Excessive intensified neurointensive care presents a risk for the patient of developing complications and longer hospitalization.

CONCLUSION

As a consequence of medical progress, mortality is gradually decreasing, but, at the same time, morbidity of the population increases. Child patients who, as a result of brain injury, can not fully return to the society represent a long-term burden on the social system. It is necessary to individualize therapeutic approaches, to the extent possible, to the needs of the patient and, in that way, to minimize the risk of complications in the provision of health care.

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DID WE FAIL THE PUBLIC? SOCIAL, MEDICAL AND ETHICAL REASONS FOR THE ANTI-VACCINATION MOVEMENT

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DID WE FAIL THE PUBLIC? SOCIAL, MEDICAL AND ETHICAL REASONS FOR THE ANTI-VACCINATION MOVEMENT

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ABSTRACT

Wide spread vaccination against infectious diseases has been considered among the major achievements of the 20th century. The end of the 20th and beginning of the 21st century saw a growing anti-vaccination movement, mainly in well developed countries. This paper identifies some reasons why parents might disagree with the immunization of their children, and suggests new approaches for health care workers to this public health and social problem.

INTRODUCTION

Vaccination has been considered among the 10 great 20th century achievements by the US Center for Disease Control (CDC) and has been similarly praised by the World Health Organization (WHO). One estimate suggests that during 1924-2012 childhood vaccinations prevented more than 100 million cases of serious disease with very few adverse effects (Gostin, 2015).

The CDC declared epidemic measles eliminated in 2000, and rubella including congenital rubella syndrome eliminated in 2004. Since 2001, US reported measles incidence has remained below 1 case per 1,000,000 population. Since 2004, rubella incidence has been below 1 case per 10,000,000 population, and CRS incidence has been below 1 case per 5,000,000 births. 88% of measles cases and 54% of rubella cases were internationally imported or epidemiologically or virologically linked to importation (Papania - Wallace, 2014). These results were a conclusion of an external expert panel convened by Centers for Disease Control and Prevention in December 2011.

But in 2014, the United States recorded 644 measles cases during 23 measles outbreaks, including one large outbreak of 383 cases, occurring primarily among unvaccinated Amish communities in Ohio.

In 2015 there was an outbreak (113 cases) linked to an amusement park in California. The outbreak likely started from a traveler who became infected overseas with measles, then visited the amusement park while infectious. Analysis by CDC scientists showed that the measles virus type in this outbreak (B3) was identical to the virus type that caused the large measles outbreak in the Philippines in 2014. From January 1 to October 16, 2015, 189 mostly unvaccinated people were infected in the US (CDC, 2015).

In EU/EEA countries, the European Centre for Disease Prevention and Control (ECDC) reported 3637 cases of measles (7.1 per million) in 2014 with the largest number in Italy (1694 cases) (ECDC, 2015a). Between January and August 2015, Europe reported 4253 cases (8.3 per million), with the largest number in Germany (2411 cases) (ECDC, 2015b). One measles-related death was reported during the period, and 8 cases were complicated by acute measles encephalitis. More than 80% of the infected had not been vaccinated (ECDC, 2015c). These numbers are from the situation before the migration crisis started in Europe.

Our aim was to look for reasons why a growing number of parents stop vaccinating their children.

Reasons for the Rising Incidence of Non-Vaccinated Population

In our research of professional literature, and also mainstream media, internet groups and discussions with people we identified several possible reasons for non-vaccination:

- Speculations about vaccine induced diseases, especially autism
- Lack of information about diseases that are preventable by immunization
- Inadequate information about immunization
- Changes in obligatory immunization schemes
- Immunization against sexually transmitted diseases
- Advertising of new optional vaccinations
- Controversial immunization pushes related to swine flu and bird flu
- Healthcare workers non-vaccinated
- Contaminated vaccines
- Vaccines produced unethically

Speculations about Vaccine Induced Diseases

Most of us have met with a parent who blames vaccination for the development of certain disease in their child. Among them are: autism, diabetes mellitus, gluten intolerance, allergies to dairy products, etc. Many of these fears are supported by mainstream media that release a suspicion report in such a way as if it has been already proven. Such information is difficult to take back. A typical case is a wide spread information about a study linking MMR vaccines to development of autism. Despite the limitations of the study and multiple studies that had different results (Jain et al., 2015), that first explosive media coverage has not been refuted in many peoples' minds.

Lack of Information about Diseases that are Preventable by Immunization

Despite a lot of talk about immunization, most people do not know basic information about the diseases that the vaccines should prevent. This is understandable because so many of the parents of today's children were immunized as children and mostly their parents were immunized, too. That is why they have not seen a patient sick with pertussis, diphtheria or polio. They do not understand the course of these diseases, possible complications or long term sequels. Few have seen such things on video or even just a picture. They do not take these diseases very seriously. Some also believe that these diseases were almost eradicated thanks to better nutrition and hygiene, rather than immunization. Also many believe that we should be able to treat them successfully with antibiotics and other medicines that were not available in the past (Wang et al., 2014). Most pediatricians and General Practitioners take immunization as a routine well established procedure and do not feel the need to explain in detail the possible symptoms and dangers of contracting the disease. We think that there is often a lack of detailed informed consent which explain facts about the disease.

Inadequate Information about Immunization

Even though most doctors explain the possibility of side effects of vaccination, this information is often brief and inadequate. Most physicians consider vaccination as a basically safe, very useful, routine procedure. Parents are sometimes surprised and startled by pain, fever, malaise, restlessness, irritability, sleep disturbances and other side effects of immunization in some children and they are not ready to react. We have experienced people travelling for holidays abroad immediately after immunizing their child and having problems in solving complications that they were not prepared for. The reactions of many doctors to parental worries are often lax, and parents think that physicians are downplaying the problems joined with immunization. They also believe that side effects are underreported by doctors to the authorities.

Changes in Obligatory Immunization Schemes and Immunization against Sexually Transmitted Diseases

The standard obligatory immunization schemes have been changing with mostly new vaccinations added to them. The exception is variolla which was proclaimed eradicated in 1980 and consequently immunization ceased. Besides this, several new vaccinations have been added in the recent years. In Slovakia, the newer obligatory immunizations are against: hemophillus invasive disease, hepatitis B, pneumococcus invasive diseases (Povinné očkovanie, 2015). The typical question of the parents is why these immunizations were not obligatory before and now they are. It is especially common for parents of children with older siblings who did not have to get these immunizations. The answers of doctors are often unconvincing.

Immunization of small children against sexually transmitted diseases (STDs), such as hepatitis B, is especially questionable. STDs can be largely prevented by high quality healthcare (sterile medical instruments, single use material, disposable syringes, needles, properly examined substitution blood products and transplant tissues), and responsible lifestyle (avoidance of intimate contact with strangers, promiscuity, sexual abuse and drug addiction). Tragic accidents are possible, but for many people they do not justify such massive scale measure as vaccination of the whole population. Immunization against one STD will not prevent people from contracting another dangerous STD (HIV, syphilis, hepatitis C) in case that such accident happens.

Some parents believe that introduction of vaccines against STDs is part of a permissive sexual education, one that also promotes contraceptive and condom use. Many accept the importance of immunization against airborne diseases and other easily transmitted diseases, but they believe that STDs should be prevented primarily by lifestyle changes.

Advertising of New Optional Vaccinations

In Slovakia, optional vaccinations are recommended against: hepatitis A, rotavirus infections, tuberculosis, influenza, human papillomavirus infection, meningococcal infection, tick-borne encephalitis and varicella.

Massive campaigns in favor of certain optional vaccines have been mixed in people's minds with campaigns in favor of obligatory vaccines. Some of the currently obligatory vaccinations have been optional in the past (pneumococcal). It is very clear that some pharmaceutical firms are pushing to get their products to be part of the obligatory scheme, which usually means coverage by health insurance companies. Such a massive campaign was launched for the immunization against HPV infection that some mothers believed their daughters will soon get cancer if not immunized. Others were offended by the implication that their daughters would engage in irresponsible sexual activities as soon as they reach puberty. The two competing vaccines included different and incomplete selection of potentially dangerous types: Gardasil (Merck), approved by the US Food and Drug Administration (FDA) in 2006, protects against HPV types 6, 11, 16, and 18; Cervarix (GlaxoSmithKline), approved by the FDA in 2009, protects against HPV types 16 and 18. The general population is worried that the schemes are not based solely on scientific evidence but rather on lobbying of pharmaceutical corporations. They even suspect doctors who support immunization to be paid agents of such companies – a phenomenon commonly seen in the internet debates.

Controversial Immunization Pushes Related to Swine Flu and Bird Flu

During the 2009-2010 outbreak of pandemic H1N1, "swine flu" vaccines were released in Europe. Some countries encouraged global population vaccination. A series of studies have produced evidence for an association between Pandemrix, which contains AS03 (squalene) as adjuvans, and the development of a serious autoimmune and neurological sleep disorder, narcolepsy. Pandemrix was administered to 30.8 million people in 47 European countries. A total of 795 vaccine adverse event reports have linked Pandemrix with the development of narcolepsy, especially among children. A large epidemiological study found a 7.5-fold increased risk of developing narcolepsy after vaccination in Finland. Similar results came from Sweden, which also had a high vaccination rate (Wijnansa-Lecomtea et al., 2013) and England, particularly in children (Miller-Andrews et al.,2013).

The Slovak Ministry of Health ordered 1 million doses of vaccines Panenza in January 2010 with the idea of immunizing 20% of the whole population as recommended by WHO. The vaccines that cost the state 7.6 million Euro were offered mainly to health care workers, chronically ill people, pregnant women, military and state personnel. The second half of the order arrived to Slovakia when the pandemic was ending (Chrípka typu A (H1N1), 2010). Vaccines for hundreds millions of euros all around Europe were unused and had to be burned.

The trust of people in immunization was shattered in these pandemics because of safety issues and perceived unjust profits of pharmaceutical companies. Rumors were spread that the pathogen was produced in laboratory to help the industry profits.

Healthcare Workers Non-Vaccinated

Most healthcare workers have obligatory immunizations. Much less go for the optional vaccines. People often do not discern between these. However, there is an increasing number of healthcare workers who do not immunize their children or themselves (Wang et al., 2014). The precise numbers are not available since in Slovakia basic immunization of children is obligatory. But it is known that during the pandemic „swine flu“ only 6% health care workers got immunized with the recommended vaccine, which was free of charge (Chrípka typu A (H1N1), 2010). If doctors do not trust vaccines, who should?

Contaminated Vaccines

In 2014, in Kenya, 2.3 million child-bearing women were supposed to be immunized against tetanus. Kenya Catholic Doctors Association reported that vials collected during the tetanus vaccination campaign sponsored and funded by WHO and Unicef contained high levels of the Beta HCG hormone (England, 2015). This hormone can be embedded in vaccines to trigger early miscarriage in women (Muchangi, 2015).

Similar anti-fertility vaccines were reported from Mexico, Nicaragua and Philippines in the 1990-ties. Suspicions were raised because of a different pattern of immunization as well as the unwillingness of WHO and UNICEF to make vaccines available for testing.

WHO and UNCEF made a joint statement that these vaccines are safe (Statement from WHO and UNICEF, 2015). But they did not try to refute this accusation in any convincing way. They did not offer multiple independent laboratories to test the vials to convince the public that the vaccines were not contaminated. We consider this one of the greatest scandals and blows against the vaccination efforts. It has led many people to stop trusting vaccination in general and to reduced support for UNICEF.

Vaccines Produced Unethically

Most religious communities have no theological problem with vaccinations in general (Grabenstein, 2013). One reason why people refuse to vaccinate is the fact that some commonly used vaccines use cell lines WI-38 and MRC-5, which are derived from tissue from human fetuses voluntarily aborted in 1964 and 1970. This means the vaccines were made using descended cells as a medium and went through multiple divisions before they were used in vaccine manufacturing.

The reasons for the abortions in this case were not related to the vaccines and no new unborn children are being aborted for production of these vaccines. According to the Instruction of the Catholic Church Dignitas Personae, grave reasons may be morally proportionate to justify the temporary use of such „biological material“. Danger to the health of children could permit parents to use a vaccine which was developed using cell lines of illicit origin, while keeping in mind that everyone has the duty to make known their disagreement and to ask that their healthcare system make other types of vaccines available. (Dignitas Personae, 2008).

Despite this statement, some people deem it immoral to use such vaccines and even remotely cooperate with evil.

There is also a concern about possible harmful effects of trace amount of DNA from aborted fetuses present in the vaccines.

WHAT CAN PUBLIC HEALTH AND SOCIAL AUTHORITIES DO?

- Revise obligatory vaccination schemes
- Explain difference between obligatory and recommended vaccines
- Improve informed consent
- Investigate potentially harmful contaminated vaccines
- Support development of ethically produced vaccines
- Review regulations for testing safety and efficacy of vaccines
- Research reasons for diseases that are being linked with immunization

Revise Obligatory Vaccination Schemes

We think that an open professional debate is necessary to determine which vaccines should be obligatory in a certain geographical area. Professionals should explain why these should be kept and be willing to exclude from obligatory schemes vaccines against diseases that are not life threatening or debilitating, or those that can be prevented by other means (sexually transmitted diseases), or treated easily, i.a. by antibiotics. The timing of immunizations against specific diseases should be reviewed and parents need explanations about why certain vaccination are usually best done at a certain time (Wang et al., 2014). The rationale behind concomitant administration of multiple vaccines should be explained.

Explain Difference between Obligatory and Recommended Vaccines

Differences between optional and recommended vaccines need to be explained. Reasons for immunizing and the best timing should be explained. Parents should not be pressured by pediatricians to vaccinate against their own judgment, rather the time should be taken to explain the needs and benefits so as to allow the parent full and complete information.

Improve Informed Consent

Doctors need to take more time for explaining to patients about the symptoms and possible progress of the disease if they decide not to vaccinate. Short videos or at least pictures of those diseases will provide better understanding about the usefulness of immunization than mere texts. Most children and adults of productive age in developed countries have not seen these diseases and tend to underestimate their severity (Wang et al., 2014).

Honest and matter of fact explanation about possible side effects and ways to handle them should be another part of the written informed consent. Patients should get a copy to take home with them. In case that patient's report a side effect, doctors should listen to them patiently and help solve the issue.

Investigate Potentially Harmful Contaminated Vaccines

In case of alleged contamination or harmful effect of a vaccine, authorities should do a proper investigation and, if found true, publicize consequences for all those responsible for production & distribution of contaminated vaccines. It is extremely important to make precautions that such things will not repeat in future. If proper investigation including independent experts finds such allegations false, detailed data should be given out to the public and media, so that the trust towards health care authorities be maintained.

Support Development of Ethically Produced Vaccines

Knowing that some vaccines have been produced with the use of unethically gained biological tissues makes some people mistrust all vaccines. Creating and promoting vaccines produced in ethically correct ways can help immunization compliance. Labeling information should include a reaffirming statement that in the production of those vaccines no cells from aborted fetuses, nor embryonic stem cells were used.

Review Regulations for Testing Safety and Efficacy of Vaccines

Some negative side effects of vaccines have been attributed to additives or chemicals used during the production process. Despite the fact that an increased incidence of narcolepsy has been reported in „swine flu" vaccines that contained AS03 (squalene), and this adjuvans is considered to be the culprit, it is still used in newly developed vaccines against „bird flu".

Regulations for testing the safety and efficacy of vaccines should be reviewed and there should be better labeling of what the vaccine contains.

Research Reasons for Diseases that are being Linked with Immunization

It is important that media does not blame all diseases of unknown origin to vaccination. Better research and more information of public should be available.

Lactose intolerance is one of those conditions now often blamed on vaccines. Many Europeans are not aware that our ancestors mostly did not tolerate cow milk. Lactose tolerance in adults was so advantageous for populations that moved to a colder climate that it became wide spread. Dairy products became an important part of human diet. Most Europeans do not know that cow milk intolerance is still very common among some African and Asian populations (Bloom-Sherman, 2005).

Medicine should be honest about the limitations of our current knowledge involving certain diseases. It would make it more credible when it does have the answer.

CONCLUSION

The broad Anti-immunization movement has been on the rise in the last decades. A lot has been written about ethical issues connected with opting out of immunization and the impact on the herd immunity. This article was reviewed many possible non-exclusive causes for non-vaccination in developed countries. We are planning to do field research on the subject.

We believe that the society and public health systems have several possibilities to improve this situation by better information, and the honest and caring approach of authorities and health care professionals.

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A CRITICAL ANALYSIS AND OVERVIEW OF THE HEALTHCARE DELIVERY SYSTEM IN QATAR

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A CRITICAL ANALYSIS AND OVERVIEW OF THE HEALTHCARE DELIVERY SYSTEM IN QATAR

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INTRODUCTION

History of Qatar

Qatar is a small peninsular country extending into the Persian Gulf and neighbored by Bahrain, Saudi Arabia, and UAE. (1). " From a place of poverty in the 1940s to an 'overgrown fishing village' in 1955 to a large city in 1965 and a growing capital in the 1970s, Doha is now the capital city" (2, p. 2) of Qatar. According to a journal article titled 'The Development of the Qatar Healthcare System: A Review of the Literature' written by author Annekathryn Goodman, Qatar was controlled by the Sheiks of Bahrain and by Great Britain, and gained their independence on September 3rd, 1971; the country was then taken over by the Al-Thani ruling tribe and the present rulers are the Emir Sheikh Tamim bin Hamad Al-Thani, the entire Al-Thani family, and close friends; Qatar functions as a constitutional monarchy where in the Emir is the main leader and his cabinet of ministers run the daily administrative of the country (3). Author Goodman further adds that the current population of Qatar is about two million and only 20 percent of the people are Qataris; the rest of the population is composed of expatriate nationals from India, Philippines, Nepal, and Sri Lanka (1). The Qataris consider their tribal roots and familial relationships as integral components of their traditional Islamic culture; their culture can be considered to be cliquey by nature since all prestigious and important work positions are assigned only to Qataris (1). Qatar is considered one of the richest countries in the world; its citizens enjoy a luxurious and extravagant life; Qatar's GDP per capita is the second highest in the world and this is primarily due to the country's rich oil and natural gas reserves (1).

CULTURAL INFLUENCE ON QATAR'S HEALTHCARE

The "traditional collectivist society" of Qatar combines its quest for modernization and medical innovation along with its traditional values and beliefs to achieve an enviable outcome of possessing the best of both the worlds (29). Qatar now has the potential to deliver a combination of cutting-edge medical treatments and technology integrated with the "social, cultural, and religious principles" to successfully meet the health needs and demands of Qatar's population (29).

Qatar, like most Middle Eastern countries values Western healthcare and tries to emulate it in its medical practices. However, the country's healthcare professionals are aware that the behavior and perceptions of the indigenous population is strongly rooted in its "folk beliefs" (30). Authors Juliene G. Lipson and Afaf I. Meleis, in their article titled "Issues in healthcare of Middle Eastern patients", have elaborated about how the cultural values and communication habits of the Middle Easterns have created mutual differences between the locals (Arabs/Qataris) and non-local medical workers. According to Arabs, momentous events like births or marriages are considered to incite envy among community members causing the rejoicing party to be afflicted with disease or calamities (30). Illness is thought to be also caused by factors like "exposure to cold, and dampness, sudden fear, emotional upset, and carelessness"; the Arabs base their eating pattern on the Humoral theory wherein consume hot foods like honey and walnuts and cold food like yoghurt and cucumber to maintain a balanced diet and ward off illnesses (30). Qataris have a "fatalistic acceptance of disease of death" i.e. they believe that God has predetermined their life and fate on Earth and they exist to obey the will of God in all matters of life (30).

Healthcare professionals face difficulties in treating mentally ill patients because of the attached stigma and the fact that the locals choose denial over rehabilitation. In case of female patients, family plays a significant role in the check-up and treatment procedures; numerous members, especially the elderly, flock around the female patient

often offering unnecessary suggestions and advice related to the patient's medical condition and interfering with the ongoing examination process. In short, demanding behavior is a part of the culture of Qatar (30). Inpatient hospital treatment is most feared by the uneducated locals because they believe that such institutions will either cause or accelerate the death process; most Islamic families object to autopsies and the religious customs of bathing and clothing a dead Arab must be strictly adhered to by the medical staff (30).

The locals trust healthcare professionals only after repeated contact and they usually prefer a single primary care physician or specialist to handle all their medical problems. In fact, a Qatari family tends to become so emotionally involved with its PCP that the physician should be available to the family round the clock and is made a part of all family events and celebrations (30). Doctors also have to conduct longer consultation sessions with locals as compared to non-locals; Qataris expect some form of prescription at every appointment and injectables are preferred over other forms of medications (30).

EVOLUTION AND GROWTH OF THE HEALTHCARE INDUSTRY IN QATAR

Overview

Prior to the oil boom, Qatar's healthcare was primarily traditional consisting of herbal medicines and untrained people performing basic surgeries (3). When United Kingdom and Bahrain ruled Qatar, Qatar's healthcare basically involved a single British government doctor visiting the country at regular intervals. Hence, to compensate for the shortage of medical services, Qatar opened its first modern hospital, Rumailah Hospital, in 1957 (4) which currently specializes in providing rehabilitative care for the disabled, elderly, and special-needs children (5, p.259). The largest non-profit public health center of Qatar and a major contributor to Qatar's healthcare delivery system is the Hamad Medical Corporation (1). It was established in 1979 and presently manages the healthcare services of eight of Qatar's ten major hospitals, namely "Rumailah Hospital, Hamad General, National Center for Cancer Research, Heart Hospital, Al Wakra, Women's Hospital, Al Khor, and Fahad Bin Jassim Kidney Center" (1). The HMC has also been accredited by the US Joint Commission and ACGME-I for being a top-ranking institution that sets excellent education and health standards (1). Besides the HMC, the government also launched the Qatar Foundation for Education, Science, and Community Development in 1955; the Education City, which forms a vital component of the Foundation, houses American, British, and French Universities to provide medical students with modern and high quality medical education and state-of-the-art technology and research facilities (1). The American University that stands out among the various educational institutions is the Weill Cornell Medical College- it was the first medical school established in Qatar and it offers both US-based and accredited pre-med and medical programs (1). Another noteworthy institute in Qatar is the Sidra Medical and Research Center which initiates operations in 2015 and promises to be an "ultramodern, all-digital academic medical center" providing innovative and excellent maternal and pediatric care for citizens and expatriates (6).

Supreme Council of Health (SCH)

Qatar's healthcare system is "administratively controlled" (10) by a central agency, i.e. the government. The government, through the SCH, controls all the aspects of healthcare including planning, infrastructure and future growth. The healthcare system in Qatar was initially overlooked by the Ministry of Health. The Ministry of health was replaced by the National Health Authority (NHA) in 2005 which was then succeeded by the Supreme Council of Health (SCH) in 2009 (1). The SCH is "Qatar's highest health authority" (7) that regulate the public and private healthcare sectors (8). The SCH is in charge of recognizing the healthcare needs of the population, overlooking and regulating the functioning of the healthcare delivery system, and identifying and incorporating various plans and programs related to improving the healthcare standards and satisfying customer needs (7). The SCH manages the healthcare services and the HMC dispenses them (7).

In 2011, SCH developed a new plan called the National Health Strategy (NHS) 2011-2016 which formed one part of the "fourteen sector strategies" to achieve "the long-term development agenda named Qatar National Vision 2030 (QNV)". The idea behind the National health Strategy was to merge the public and private healthcare sectors into a 'universal healthcare system' and expand the quality and range of services provided to the people (7). The NHS is working on three aspects of change (9):

a) It wants to shift Qatar's healthcare focus from its medical model approach of diagnosing and treating illnesses to a more preventive healthcare system that educates the people about benefits of healthy food habits and lifestyle and directs them to avail of primary healthcare center facilities prior to opting for specialized care;

b) It also wants to give the people the right to choose between and have access to both public and private healthcare services at economical rates;

c) NHS wants to create a pool of resources involving professionals from the fields of education, research, and health so that the country's population gets the most modern and finest quality of medical care.

A "Project Management Office (PMO)" oversees the activities of the NHS by coordinating the work efforts on different projects, updating the NHS about the work progress, and supplying project teams and departments with "subject matter expertise" (9).

Public and Private Healthcare Sectors

The public healthcare services are structured in the following manner (3): a) Primary Healthcare level for preventive care and basic physicals; b) few specialized clinics located in HMC centers for specialist care; c) teaching hospitals dealing with specialized care.

The private sector occupies a large part of the healthcare industry of Qatar and provides for 67 percent of the total healthcare providers (3). The prominent private healthcare facilities are the American Hospital Doha, Doha Clinic Hospital, Al Ahli Hospital, and Al Emadi Hospital. The SCH supervises their operational and licensing standards. Currently, the government is pushing for the expansion of the role of private sector in healthcare in order to relieve the burden of the public health sector (3).

HEALTHCARE PROFESSIONALS

Medical Education and Medical Staff Shortage

The inauguration of Qatar's first medical school, Weill Cornell Medical College, in 2001 marked the country's progressive entry into the field of medical education. Presently, Qatar has incorporated teaching and training into majority of its healthcare faculties and institutions, examples being the HMC, University of Calgary, Qatar university (Qatar's second medical university set to open in Fall 2015), Sidra, College of North Atlantic etc (11). HMC joined hands with Weill Cornell Medical College to launch the "Academic Health System (AHS)" in 2011 as the world's first attempt to form a common partnership among all the medical organizations, schools, and health facilities in Qatar to achieve consistent and cost-conscious standards and quality of health through outstanding academics and research (8).

Traditional Qatar had ample healthcare facilities and professionals to handle the needs of its limited population. However, now it faces a serious shortage of generalists, specialists, and nurses due to the following reasons: a) With globalization and rise in the country's status internationally, Qatar has been overwhelmed with the sudden rise in the volume of expats and foreigners entering the country; b) Along with being the world's richest nation according to its GDP, Qatar has the distinction of being labeled the "fattest country in the world" (12). Since the locals have an affluent lifestyle and are averse to fitness and healthy eating, the country is dealing with a rising pandemic of obesity, cardiac diseases, and diabetes leading to increased workload on practitioners; c) Qatar has a history of birth defects and genetic disorders because of the culture of marrying close relatives for which abundant specialist care is required; d) Qatar's healthcare institutes have a shortage of local students (only 20 to 25 percent local admission) since healthcare is not the desired of professions in Qatar and locals struggle with language barriers since the medical schools use English as the primary language of teaching (11). Due to these factors, the expat population forms 69 percent of the physician population and 91 percent of the nurse workforce; the recruits also use Qatar as a "temporary stopgap" and this attitude results in constant change in the "skill base" leading to inconsistent standards in healthcare delivery (11). The government is trying to combat the service shortages by constructing massive new hospitals and healthcare facilities to accommodate the increasing volume of patients and to broaden the healthcare workforce. An ideal example is the Sidra medical center which has attempted to create a diverse and

culturally-tolerant team of workers by hiring 600 physicians, 2,000 nurses, and 800 allied healthcare professionals from within the country and abroad (14).

Medical Licensing

Healthcare professionals, whether private or public practitioners and local or international, currently obtain their license to practice from the "Healthcare Practitioners Registration & Licensing Department in the Qatar Council for Healthcare Practitioners (QCHP)" (9). The QCHP has been instituted to follow standardized methods of licensing and ensure that the people of Qatar get high quality care from knowledgeable and experienced professionals (9). QCHP has also simplified the registration/evaluation process for professionals, whether physician or non-physician, by creating process maps on its online portal (13). The exception here is the HMC which currently maintains its own licensing system (5); this will probably change once national healthcare is established. With the initiation of the National Health Strategy, the SCH has now developed a "National Program for the Licensing and Accreditation of Healthcare facilities scheme" which will commence in October 2015; this program will promote healthy competition among providers by giving patient the freedom of choice (12). The SCH has also launched an "online patient complaints system" for registering feedback about and grievances against providers (12).

Non-Physician Personnel

Nursing is not a preferred profession among the locals due to the following reasons: a) the concept of looking after patients is considered to be demeaning to their wealthy status; b) their Islamic roots restrict them from having contact with the opposite sex; c) and they are not accustomed to strenuous work standards (15). Nursing education is obtained from the University of Qatar (BSc degree) or from the Ministry of Public Health (diploma) (3).

Dentistry was a neglected profession until Qatar was reported to have alarming rates of oral caries and periodontal disease among its local population. Currently, Qatar does not have a dental school- however, the HMC offers regular programs and workshops to licensed dentists (local or expat) in order to update their skills in dental surgeries and usage of latest dental technology and materials.

According to the website of Qatar University College of Pharmacy, the pharmacy program is the only international program to be awarded full accreditation status by the Canadian Council of Accreditation of Pharmacy Programs (CCAPP) from 2014- 2018 ; the college offers three academic degree programs: BSc, MSc, and PharmD (16). In their online article titled 'Pharmacy practice in Qatar: challenges and opportunities', authors Nadir Kheir and Michael Fahey state that Qatar lacks an independent professional pharmacy association to regulate or promote the country's pharmaceutical practices (17). Also, despite the presence of a college for pharmacy, majority of the practicing pharmacists are expatriates originating from India, Jordan, and Egypt (17). The authors further mention that SCH, based on Qatar's treaty agreement with the "International Conventions for Narcotics and Psychotropics", regulates the import, export and distribution of controlled drugs, and also supervises the sale of traditional medicines and food supplements (17). The Department of Pharmacy and Drug Control in the SCH is in charge of monitoring the physical workspaces of all pharmacies and drug stores (17).

FINANCING AND INSURANCE

Health Card and Private Insurance

Qatar is a small and resource-rich country giving its people easy accessibility to healthcare services (3). Expats and visitors have full access to both public and private healthcare facilities. Initially public healthcare services at the HMC facilities were free for both citizens and expats. With the rise in population and healthcare costs, the government had to introduce the concept of the 'Health Card' which allows expats and foreigners to avail of public healthcare at highly subsidized rates; the Health Card is charged with QR 100 (US $26.66) annually that pays for basic laboratory tests, consultations, and inpatient care (18). Locals continue to have free access to most of the public health services, except for certain super-specialized services like plastic surgery. Public emergency services remain free for all people-however, since the services are largely misused and ER departments are overcrowded with mostly non-emergency cases, private health sector encourages people to buy private health insurance to gain access to private facilities and to ensure that they receive timely and good ER care.

Private healthcare services are not covered by the Health Card and even locals have to pay for access to private healthcare faculties. Private facilities are limited in their ability to provide tertiary care and hence patients have to rely on HMC facilities for extremely high-end care like ICU services. Private healthcare bills are paid either directly out-of-pocket or according to the rates set by the private health insurance companies. Private health insurance is purchased at one's own discretion since it has not been mandatory by the government. However, the government has advised its people to purchase private insurance because the costs associated with long term conditions or therapies like chronic diseases and chemotherapy or constructive surgeries like plastic surgery can eventually amount to massive bills for out-of-pocket payers; it has also recommended that locals and expats employed in Qatar work with their employers to include private health insurance in their work contracts (19).

Qatar commenced the Social Health Insurance Scheme, one of the goals of the National health Strategy, for achieving a universal healthcare system in 2013 which was "marketed in the country as the National Health Insurance (NHI)" to insure all people for minimum standards of healthcare (11). The insurance scheme titled 'SEHA' is handled and administered by the government-owned National Health Insurance Company (NHIC) (9). Insurance plans can be used in both public and private healthcare facilities. Currently, the NHIC is working towards making SEHA mandatory for locals, expats and visitors. The leading US-based healthcare insurance company Aetna has the distinction of being been named as one of the two subcontractors (the other one being GlobeMed) for NHIC to assist in clinical and disease management services. GlobeMed has been put in charge of the administrative and call center services (25).

Healthcare Expenditure

Despite the launch of SEHA, the government of Qatar still funds most (85%) of the healthcare in the country and majority of the expenditures are associated with the public sector. The government spends about QR 7,000 per person (21). According to the Qatar Health Report of 2011, the SCH now calculates its spending based on "program-based budgeting" and not through the historical "annual global budgets" (20).

The report further states that (20): the Total Health Expenditure (THE) in 2011 was 12.1 billion in Qatari Riyals (QR) (approximately USD $ 3.3 million); the per capita THE was approximately QR 1,920, which is higher than the GCC average; the government spending in healthcare totaled up to about QR 9.37 million due to government's increased investments in healthcare technology, infrastructure, and labor; the private health expenditure amounted to about QR 2.54 billion with out-of-pocket payments forming 13 percent of THE. The private health expenditure is comparatively lower because people continue to have easy accessibility to public healthcare services. With the initiation of the SEHA, public and private healthcare facilities are working on creating "cost-sharing" partnerships and shifting the healthcare responsibility to private providers and nursing staff (20). The government has also agreed to pay the premium of its citizens; expats will have to be covered by their employer (21). Since the government also finances the pharmaceutical industry, drugs are available at low prices for the public, e.g. a course of antibiotics costs about USD $1.50 (1).

In terms of external financing, Qatar is not funded by any external firm or organization with the exception of the WHO (3). US companies like PricewaterhouseCoopers have collaborated with Qatar to help the country in improving the quality of healthcare delivery, but they do not finance any section of the healthcare system (3). Being an oil-rich country with prosperous citizens, Qatar rarely experiences shortage of funds because of the charitable donations from within the country (3).

For citizens opting to travel abroad for treatment, the government finances their entire treatment as well their travel and living expenditures (11). In 2012, around 3,160 Qatari patients went overseas and their preferred international destinations are Germany, USA, Thailand, and UK (11).

Reimbursement Methods

Providers must file electronic claims in a standard format as directed by the SCH. The various medical procedures are coded in a unified manner based on "international coding standards (ICD-10- AM for diagnoses and Australian Classification of Health Interventions or ACHI codes for procedures)" (22). Qatar is the first among the GCC countries to introduce the concept of "Qatar Outpatient Classification System" as a progressive step towards NHI's goal of "prospective reimbursement" system (9). Hence, outpatient reimbursements are "partially bundled" to

minimize costs. Inpatient reimbursements are done only through "Diagnosis Related Groups (DRGs) using and Australian grouper software (22).

OUTPATIENT AND INPATIENT CARE

Outpatient Care

Outpatient care is provided by the "outpatient departments of hospitals and health centers operated by the Primary Healthcare Corporation (PHCC), Ministry of Interior (MoI), Qatar Petroleum (QP), the Qatar Red Cross Society (QRCS), as well as various private health centers and clinics" (7). Private health centers and clinics offering outpatient care are primarily located in the capital city, Doha and many of them provide both primary and specialty services (7). In 2015, The HMC has released a Master Plan which addresses future changes in the outpatient services in Qatar (23): a) The HMC has almost completed the construction of a "state-of-the-art" Ambulatory Center in the Hamad Bin Khalifa medical City which will offer a comprehensive selection of outpatient services combined with elective surgical procedures to reduce inpatient hospitalizations. The Ambulatory center is also known as the AMis (Ambulatory and Minimally Invasive Surgery) Hospital and its houses everything related to outpatient care in terms of short-stay preoperative and recovery beds, surgical rooms, suites for specialized services in podiatry, ENT, urology, and ophthalmology, and a massive imaging suite (24); b) Another construction in progress is the Qatar Rehabilitation Institute which offers a wide range of therapeutic treatments like hydrotherapy or therapies applicable to specific areas like speech and occupation, treatments for traumatic brain injuries and strokes, and specialized devices like prosthetics and orthotics.

Primary and Preventive Care

The PHCC, which was established in 1950, still stands as the most important primary healthcare provider in Qatar; the corporation runs 24 health centers in collaboration with the local ambulatory and ER facilities to provide a wide range of primary care services like immunizations, medications, health education and awareness, infant and maternal care, and early diagnostic services (24). As the primary healthcare industry grew in importance in Qatar, the government expanded the role of primary healthcare by making school-related healthcare a primary healthcare priority (3). SCH runs the "Division of Childhood Immunization" that offers immunizations for childhood diseases like measles, mumps, polio, and pertussis; also, the anitiinfluenza vaccine B has been added to the "newborns comprehensive immunization program"-a first among the healthcare programs in the GCC world (3).

Qatar also runs a comprehensive preventive healthcare department which deals with preventing the spread of infectious diseases, quarantine control in public areas, and environmental welfare (3). Non-contagious conditions are monitored by the "Non Communicable Disease Surveillance System" which was set up in 2002 to promote healthy tobacco-free lifestyles and nutrition (3).

Inpatient Care

Inpatient care is offered by thirteen public and private hospitals namely HMC facilities, Wakra Hospital, Al Khor Hospital, Women's Hospital, Al Ahli Hospital, etc.(11). According to a 2011 report, majority of the inpatient care is provided by the HMC facilities (approximately 75%) (7). In inpatient departments or facilities, patient beds are grouped based on a bed-type classification set by the Qatar Healthcare Facilities Master Plan (QHFMP) 2013-2033 (7).

HEALTHCARE TECHNOLOGY

In the past, Qatar's health information systems performed below par i.e. healthcare providers were not connected with each other, health data collection methods were outdated, and the services provided were insufficiently monitored. Currently, the healthcare delivery system in Qatar, funded by the country's profits from its natural gas business, is gaining worldwide importance for its advancements in medical technology. The country's culture has moved beyond its dependence and faith in traditional medicine and progressed towards an insatiable demand for high-tech expertise and care which has helped in the rapid diffusion of technology into the healthcare industry (10). In fact, the government's want for state-of-the art technology irrespective of cost or established health benefit, a desire termed as 'technological imperative' (10), puts the country at risk for exponential healthcare costs.

The public HMC facilities possess far more Major Medical Equipment (MME) like CT, MRI and dialysis machines than the private facilities.

The SCH is in the process overhauling its paper health record system to make way for Electronic Health Record (EHR)/ Electronic Medical Record (EMR) keeping. Cerner, a leading health IT firm, has collaborated with HMC to provide "Health Information Technology (HIT) systems" and support to improve clinical and management standards by providing for EMR and role/venue- based systems to better the medical device connectivity among providers and to have easy and direct access to patient records from multiple destinations (24); the electronic data collected via the technology systems from the medical centers across the country will be utilized for future research and healthcare advancement purposes in Qatar (24). Every citizen of Qatar will have an online personal health record (an E-Health project) to review at his/her own discretion and use it to obtain continuity of care from and maintain an active interaction with his/her provider and related healthcare facility (24). An impressive example of health technology can be observed in the Sidra Medical and Research Center which promises to be completely digitalized in its functioning incorporating programs like PowerScribe 360 (speech recognition software) and Radiology Information System (RIS) and Vendor-Neutral Archive (VNA) for radiological purposes (26). Another example is the Aamal Medical Center which initiated a robotic pharmacy system for accurate dispensing and distribution of pharmaceuticals (27).

CHALLENGES TO QATAR'S HEALTHCARE SYSTEM

Qatar's approach towards healthcare delivery is challenged by many constraints. Since US plays a big role in the functioning of the country, Qatar is attempting to match its healthcare system to the American model of healthcare. Unfortunately, Qatar lacks the experience and expertise of the workforce in the United States. Also, even though the people of Qatar are open to technology, their traditional roots and insufficient intellectual knowledge prevent them for recognizing its value and this poses a challenge for the government in that people might either abuse or under use the modernized services. Another challenge is the cost of Qatar's rapid progression in healthcare. Qatar has invested vast amounts of its monetary resources in healthcare development. However, with the recent plummet of oil prices, the economies of all GCC countries have been hit hard and Qatar has been affected the most (28). Hence, with rising healthcare costs, Qatar at risk of being unable to maintain the operations of its state-of-the-art facilities and the quality of the services offered. Consequently, Qatar might have to start relying on the population to finance the healthcare system which inadvertently will lead to higher medical bills for the common folk. Qatar is heavily dependent on expatriate healthcare professionals for healthcare delivery. There has been a sharp rise in the population of Qatar and now, the country faces a shortage of healthcare staff because the Qataris are not interested in servicing the healthcare industry and Qatar is fighting to retain its current expatriate workforce who is disgruntled with the heavy workloads. Lastly, there is a lack of association between Qatar's hospital system and clinics. This being the major reason behind inconsistent quality of care. The lack of integration makes the task of gauging the healthcare providers and the quality of healthcare by one standard of metrics unyielding. According to DOHA news report, March 21, 2014, primary care provides referrals to secondary services but often without a standard referral letter and with limited flow of information back to the primary care system. Especially of concern is the fact that secondary services do not furnish a standard set of clinical information to primary care after a patient episode, thereby jeopardizing the continuity-of-care process (1).

STRATEGIES FOCUSING ON PATIENT RIGHTS & STANDARDIZED CARE

The Value Agenda

Integrated Practice Units (IPU)**:** Delivering care arounds the patient. The greatest revivification in healthcare productivity can be attributed to sustained, team-based focus on a carefully defined set of medically integrated services and practices. IPU will achieve scope and scale by growing locally and geographically in their areas of strength, rather than expanding the breadth of their service. It is the answer to the Qatar's segregated care delivery. IPU is responsible for the full cycle of care for the condition, which includes outpatient, inpatient, and rehabilitative care as well as supporting services.

Advancement in Primary and Secondary Healthcare Delivery Using IT Systems

Qatar faces shortage of healthcare workforce and at the same time takes on the need to advance their healthcare technologies. The process of HIT advancement involves the implementation of strategies and advanced courses designed to bring together stakeholders impacted by Information Technology in healthcare i.e. CEOs, CIOs, physicians, nurses, researchers, vendors, and academics – to ensure they receive an in-depth, applied understanding of the challenges and opportunities health IT presents. Effectuation of continuing education programs for individuals who comprehend the practicality of and demand meaningful, evidence –based learning environment.

QATAR- U.S. COLLABORATION FOR A BETTER HEALTH SYSTEM

Qatar is one of the wealthiest countries in the world and according to the Qatar's Finance Minister Ali Shareef Al Emadi, the financial budget for the U.S investment is $35 billion. The investment is geared towards technology, healthcare, real estate and infrastructure projects (2). Qatar is in partnership with Partners Healthcare, University of Maryland, Duke University Health System, John Hopkins Medicine, and Institute of Healthcare Improvement and many others to help the country develop Medical Institutions, research infrastructure and better quality care (3).

The Partners of Healthcare International (PHI) is a global, non-profit healthcare system in America founded by Massachusetts General Hospital and Brigham and Women's Hospital. The partners of healthcare have been in collaboration with Qatar to improve their National Healthcare system since 2008. This collaboration took place after the development of the Supreme Council of Health, which was created to better the country's public health system. The collaboration's aimed areas of improvement include the Clinical Leadership, Integration in the Healthcare System, Quality and performance and Women's Health (1). In 2010, Hamad Medical Corporation (HMC) formally entered a legal agreement that allowed HMC to rely on the expert knowledge and advice of the PHI towards the Integration of its health system and its development. PHI also assists HMC in the managerial leadership required in their practices, which helps with proper decision-making, adequate resource allocations and better quality of service. The PHI and HMC established a three year patient safety and quality/performance program for its health system (1). In 2012, a three year partnership was also created to have the leading physicians from Brigham and Women's Hospital, North Shore Medical Center and Newton-Wellesley Hospital educate and transform Qatar's Women's Health department through obstetrics and gynecology. Establishing relationships with Bostonian Clinicians has engendered regular visits and innovative suggestions to help better Qatar's health system. In order to increase the quality of their patient referral services, in 2013 PHI and HMC entered another agreement to have Partner's Harvard affiliate Hospital as a major location for their preferred patient referral (1).

CONCLUSION

Qatar's healthcare system has grown tremendously in the last 50 years and has become a laudable pioneer for health management and development in the Middle East. The NHS 2030 has created a very promising future in healthcare for Qatar as Qatar progresses towards a palliative health environment.

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A COMPARATIVE ANALYSIS BETWEEN THE UNITED STATES AND BRAZIL: ARE HEALTH POLICIES ALIGNED?

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ABSTRACT

Biological, environmental, social, economic, and political elements critically impact global- and population-health outcomes such as morbidity and mortality. This report shall demonstrate and recommend specific public health education, research, and practice strategies resulting from comparing the impact of past and current fiscal policies on national morbidity and mortality data among the United States and Brazil, specifically as it relates to cardiovascular disease. Public health education, research, and practice can improve individual and population-level quality of life and outcomes by assessing specific biological, environmental, social, economical, and political factors and issues. Furthermore, developing effective health policies as a result of these assessment can significantly improve lives, communities, and generations.

The economic data, such as aggregate spending per capita, are from the World Health Organization (WHO). The epidemiological data, such as morbidity and mortality, are from national databases: the Informatics Department of SUS (DATASUS, Brazil), and the Centers for Disease Control and Prevention (CDC, USA). The preliminary analysis of the economic data showed the USA as the country that spends most on health, between 2009 and 2013 the average spending was $8579.40 US dollars/capita. Brazil's average was $1010.00 US dollars/capita. The average total health spending as a percentage of GDP presented the US as the country that spent most on health at 17.00%, and Brazil at 9.40% of GDP. The greatest cause of death between 2009 and 2013 was cardiovascular diseases – and it is this impact and burden that presents cardiovascular disease as not only the leading cause of death but morbidity as well. The number of deaths in the USA and Brazil was 600,899, and 330,925, respectively. With the same data, the average of rate death per 100,000 population in the USA was 192.92, and in Brazil 170.65.

Even in a country with major health spending, such as the US, higher spending does not necessarily translate to less mortality and morbidity (per capita). A multitude of factors with interacting complexity due to cultural, social, economical, and political factors can influence access to healthcare (e.g., universal insurance). The assessment of these national level data may offer a guide to understanding the relationship between economy and health. Moreover, we shall recommend specific public health education, research, and practice strategies that will positively transform our countries of interest.

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STRATEGIES FOR MANAGEMENT OF DIABETICS IN KUWAIT

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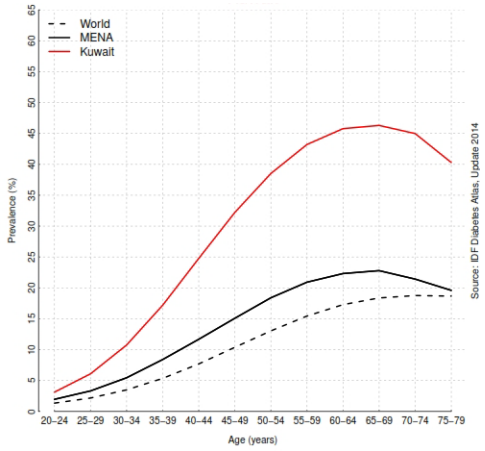
ABSTRACT

Diabetics is a leading healthcare problem in Kuwait. There were 424,000 cases of diabetics in Kuwait in 2014 out of 387 million cases worldwide. This translate to significantly higher proportion cases in Kuwait given the small size and population of country. Following graph taken from International diabetics Federation clearly demonstrates the extent of problem in Kuwait in comparison with Middle East and North African Region (MENA) and rest of the world.

Figure 1: Prevalence of diabetics in adults, 2014
(Source https://www.idf.org/membership/mena/kuwait)



The Closure look at above graph indicate varying degree of prevalence of diabetics among different age groups of population. Given the culture plays significant role in defining gender roles, literature suggest gender is also factor to consider. General awareness about diabetics is rising through the use of social media, television and public events. Numerous campaigns has been undertaken by government and non-governmental organizations to increase awareness and better management of disease.

In this research we look at different strategies for management of diabetics in Kuwait. How they differ or affect when it comes to different age groups, gender and level of connection of disease with the individual (diabetics, pre-diabetics, someone in family with diabetics and none). We also look at role played by public awareness campaigns and efforts in the management of diabetics.

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THE RELATIONSHIP BETWEEN HEALTH RISK AND WORKPLACE PRODUCTIVITY IN SAUDI ARABIA

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ABSTRACT

The rising prevalence of non-communicable diseases (NCDs) worldwide has increased the burden on global health resources. NCDs negatively affect workplace productivity in the United States with lost productivity contributing to growing direct and indirect costs for employers due to lost work time and reduced employee presenteeism. Presenteeism refers to lost time when an employee is not focused on his or her work, and is producing poor quality and/or quantity of work.

Effective organizational performance requires a healthy and productive workforce. The health and economic model considers the impact of employee capabilities on organization performance. Understanding that employee health has a relationship with business performance is the historical foundation for health and productivity management. Chronic health conditions are severely affecting the Middle East as they among the world leaders in diabetes, obesity, and respiratory diseases.

This analysis compares the established programs in the U.S. with those in the Middle East, particularly Saudi Arabia. It also identifies the differences between U.S. and Saudi Arabia in the prevalent NCDs and explores the underlying cultural drivers.

Establishing baseline health and productivity data, unique to Saudi Arabia and the Middle East, is an important first step in strengthening human capital investment in the region. Rigorous employee wellness program evaluation is challenging without robust data, and building a business case for launching programs become increasingly difficult. The link between health and workplace productivity has been well researched within the U.S., but not within the Middle East, particularly Saudi Arabia.

This in-process investigation explores in a quantitative manner the relationship between lifestyle health risks and productivity in Saudi Arabia. The location of the study population is a large energy company in Saudi Arabia with 55,000 employees. The purpose of the ex-post facto study is to examine baseline health and productivity data and determine the relationship between lifestyle risk and productivity in Saudi Arabia.

The information gathered in this study allows the researcher to determine the relationship between lifestyle health risks and workplace productivity in the employee population. Productivity data is projected to enable international benchmarking to compare Saudi Arabia to the U.S., to evaluate whether unique social and cultural health behaviors alter workplace productivity.

The research question guiding for the study is "What is the relationship if any, between the incidence of lifestyle health behavior risks and workplace productivity in a large oil company in Saudi Arabia?" This general question is divided into five specific research questions. The dependent variable presenteeism is measured by the Stanford Presenteeism Scale (SPS)-6. Each of the independent variables: physical activity, tobacco use, sedentary occupation (sitting ≥ six hours), and nutrition, are measured through self-reported data conducted in a Health Risk Evaluation (HRE). BMI is measured as part of a physical screening. The HRE is a self-administered questionnaire that examines health status and behaviors. The six question SPS-6 is contained within the HRE and is the first step in enrolling in the wellness program.

The investigation design involves a correlational approach to examine the relationships between five major health

behaviors and workplace productivity. Multiple regression examines the relationship if any, between the individual risks and productivity.

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PRICING AND REIMBURSEMENT POLICIES ACROSS EUROPE OF ANTIMICROBIAL AGENTS

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ABSTRACT

Understanding pricing and reimbursement policies starts from the definition of price. The most widely accepted theory of the price is that of balance between supply and demand. According to this theory, the price of a specific good on a free market results from two variables – supply and demand. A price is the equilibrium point, at which the demand for a specific good equals its supply.

However, in the case of pharmaceutical market free/perfect market principles cannot be observed. A perfect market is a market which is defined by several conditions, collectively called perfect competition. Among these conditions are:

Perfect market information, which is not situation in not the case on health care market where patients does not know enough about therapies.

No participant with market power to set prices – we don't have this in health care market - Patents of drugs produce monopolies in therapies. Also central tendering gives government the power to set price.

No barriers to entry or exit and for medicines Quality and safety are significant barriers to market entry, as well as cost effectiveness.

Equal access to factors of production and in pharmaceutical and biotechology many factors of production are trade secrets or high technology

No externalities where excellent example is herd immunity in vaccinations.

When a perfect market doesn't exist government intervention is often the only tool available to manage the negative impact caused by market imperfections and obtain better outcome. The extent to which government interventions improve or indeed make things worse in a health care system is known as the study of pricing and reimbursement policies.

On the pharmaceutical market on the supply side, drug prices depend on the activities of the manufacturer and the wholesaler, while on the demand side are pharmacist, physicians and the patient. In a fully public healthcare system payer is 3rd party payer with no control over overall activities. Total pharmaceutical spending is therefore a function of the price and volume on the pharmaceutical market.

Strategies to contain the growth rate of pharmaceutical expenditure have included national and global (and supranational in the case of the EU) initiatives, many of which are linked to the international development agenda. Global initiatives have focused on promoting access to products that would otherwise be unaffordable – such as new medicines – and prioritizing products that have a major public health impact – such as medicines for tuberculosis, HIV/AIDS and malaria and specific products for maternal and child health.

The role of health technology assessment (HTA) in the process of pricing and reimbursement is becoming crucial, since HTA by definition takes all the required criteria for decision making into consideration and also looks at best practices with technologies.

HTA is a structured analysis of health technology, a set of related technologies or a technology related issue that is performed for the purpose of providing input to a policy decision. It encompasses safety, efficacy (benefits), costs and cost-effectiveness, organizational implications, and social and ethical issues.

HTA may offer solution for controlling health expenditures, whilst improving quality. There is growing trend, especially in Western Europe, to define benefits through a process of using evidence. It is important to emphasize that HTA methods and processes recognize the unique needs and circumstances of individual countries. This is especially true of smaller, low capacity countries, like Serbia, which frequently lack resources needed to develop and implement more formal and comprehensive assessments.

One of the regulatory tools is drug reimbursement in a wide sense of the term. Reimbursement is a method to ensure availability of drugs of proven effectiveness and safety, being the most cost-effective among treatment options and possible to finance with the available funds. Various reimbursement systems are used in Europe and the whole world and each of them may be subject to criticism.

One policy area where there remains considerable room for improvement is the use of generic medicines, through which potential savings can be used to improve access to innovative medicines.
Generic drugs are frequently as effective as, but much cheaper than, brand-name drugs. Because of their low price, generic drugs are often the only medicines that the poorest can access. Indeed, it is argued that competition between drug companies and generic producers has been more effective than negotiations with drug companies in reducing the cost of drugs, in particular those used to treat HIV/AIDS.

First biological medical products, produced with DNA recombinant techniques, were approved in the 1980s and the exclusivity rights (patent and other protections) for several biological medicinal products have reached their expiration and many more will expire in coming days. Consistent with this expire biosimilars are being developed and several are already available on European markets.

The EU was the first region in the world to have set up legal framework and regulatory pathway for biosimilars. BIOSIMILARS may offer less costly alternative to existing biological medicines which have lost their exclusivity rights. Their availability enhance competition with a potential to improve patient access to biological medicines and to contribute financial sustainability of health care system.

To date there have only been limited price reductions for biosimilars, they have typically averaged between 15% to 30% of the originator price in both Europe and US. This has been higher in Austria - price reductions are 48% for the first multiple sourced biosimilar; mirroring the situation for small molecule oral generics.

The prices requested for the new hepatitis C medicines – in particular the direct-acting antivirals as sofosbuvir – are unsustainable for most countries' health budgets. In many countries they are restricted to hepatic fibrosis F3A4 and early stages are not treated; hence, this transmissible disease will continue to drive new infections.

Access in high-income countries, like the EU Member States, to innovative treatment products such as anti-infective medicines could be revisited using a new tool – the European Commission (EC) Joint Procurement Agreement – which sets out the modalities under which EU countries can jointly procure medical products.
Understanding and addressing current challenges regarding hepatitis C medicine are important for the future introduction of new medicines in other areas. With a focus on public health, a dialogue with stakeholders on access to innovation is urgently required.

Differences in culture, history, politics, health-care financing, have had important effects on the outlook and function of P&R in each country. In Europe and the developed world, HTA is the key mechanism for ensuring "value for money". HTA should combine assessments of clinical effectiveness, societal values, budget impact and economic efficiency, as well as ethical judgments of the relevant population. HTA process to be successful, open, transparent and consistent it is necessary to be accepted by all stakeholders: health care policy makers, payers, health professionals, patients' associations and pharmaceutical industry.

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APPLICATION OF INNOVATIVE TEACHING METHODS IN PUBLIC HEALTH

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APPLICATION OF INNOVATIVE TEACHING METHODS IN PUBLIC HEALTH

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ABSTRACT

Through experiential education, authors are trying to make teaching of subtopics of public health, which are mainly topics of epidemiology and hygiene, attractive. An aim of the project was to determine whether the experience gained during interactive lectures and experiential programs in other healthcare area deepens the required theoretical knowledge and practical skills in public health activities and at the field of use of personal protective equipment. In total, 268 students attended the project. Experimental group consisted of 93 students, conventional way of study experienced 175 students. The pilot group which completed teaching by experiential education showed a higher success rate at disinfecting hands than the control group (92% vs. 75%). The pilot group also showed improvement of theoretical knowledge of the control group in control theoretical test (23% vs. 15%). Therefore, experiential form of education with interactive and audiovisual aids seems to improve memorizing the information and using the knowledge in practice.

INTRODUCTION

To improve the effectiveness of teaching and to mediate new teaching methods by the form of experiential learning are the essential goals of the project: Innovative methods of teaching public health in the context of lifelong learning of paramedics in Ambulance Service of the City of Prague. By this form of education authors are trying to make teaching of subtopics of public health attractive, which are mainly topics of epidemiology and hygiene in conditions the pre-hospital care and occupational health. The implementation of the training program authors based on information that the knowledge that we learn by a "personal experience" remain memorable and better utilized in the longer term (Svatos, Lebeda, 2005). A secondary aim was to determine whether the experience gained during interactive lectures and experiential programs deepens required theoretical knowledge and practical skills in epidemiological - sanitation activities and the use of personal protective equipment.

METHODOLOGY

The methodology of the project lies in the education of paramedics in the areas of public health in five steps. In the first phase of the project we have interacted students with the theoretical information in the field of hygiene and epidemiology supplemented also with case studies of using personal protective equipment in a real environment. In the second phase we conducted verification of acquired knowledge through e-learning test and a practical test of hand hygiene using UV lamps for quality assessment of carried out disinfection. The third phase of the project consisted in the preparation and implementation of experiential tasks that students implemented in a real environment with real equipment. After fulfilling the tasks we carried out a key reflection focusing on the sensations delivered by course, knowledge of the use of personal protective equipment by using e-learning course, including practical control of hygienic hand disinfection using UV lamps with fluorescent substance. In the fifth stage of the investigation we conducted focus-group method. And at last, we compared the results of e-learning test group that

received instruction in the form of experiential education with a group of employees who had completed only the conventional method of teaching. In total, 268 students attended the project. Experimental group consisted of 93 students, conventional way of study 175 students experienced.

RESULTS

The pilot group completed teaching by experiential education showed a higher success rate at disinfecting hands than the control group (92% vs. 75%). The pilot group showed improvement of theoretical knowledge of the control group in control theoretical test (23% vs. 15%). Within the project of innovative teaching methods, we found that 50% of the students were using personal protective equipment inadequate. In a focus-group survey, we found that the innovative method of teaching is the well accepted by students as an attractive form of education.

DISCUSSION AND CONCLUSION

Innovative teaching methods are the modern form of education that can be applied in public health. As some authors say: "Experiential education allows immediate use of the knowledge and skills in practice (Hanus, 2009)." We agree with the opinion, that actual experience, one should learn in the educational environment properly prepared and with properly prepared tutors (Sauerova, 2013). Usually information heard, is remembered only for a certain period of time and to a limited extent (Svatos, Lebeda, 2005). But if instead of memorizing audiovisual aids and procedures are implemented, information is more likely to be remembered. The experience that we are able to try "on our skin" remains memorized and utilized long-term (Svatos, Lebeda, 2005). Currently, an innovative method of paramedics' education in the sphere of Public Health is implemented only by one emergency medical service in the Czech Republic.

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TRACK
NURSING

IMPLEMENTING A LAY NAVIGATOR INTO A COMMUNITY OUTREACH PROGRAM

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ABSTRACT

Washburn University's School of Nursing has provided community outreach using a Mobile Health Unit since 2012 to a medically underserved population in east Topeka, KS. Due to the success and growing demands of this community, the service has continued and added students from other schools in the University including physical therapy, occupational, and respiratory therapies, social work, psychology, and kinesiology. For many years the El Centro de Topeka has benefited from the services that have been provided and now the next step is to train community members to be health navigators and provide the community in services throughout the year. Although care will be provided during semester periods, these health navigators will operate during the periods that students are not available. This study will be focusing on the Latino population in the areas of nursing and physical therapy, as well as discussing the lay navigator's process of training.

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KNOWLEDGE AND ATTITUDES OF SAUDI NURSES TOWARD PAIN MANAGEMENT: STRENGTHS AND WEAKNESSES

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ABSTRACT

Pain is one of the most common symptoms experienced by patients. Pain control is a vitally important goal, as neglected pain can cause patients to lose hope, impede their response to treatment and negatively affect their quality of life.

Nurses spent long time with patients, and their role in pain management is crucial. However, reports indicated that nurses may lack the adequate knowledge to manage patients' pain and hold negative attitudes toward pain management as well.

Kingdom of Saudi Arabia (KSA) is one of the fastest growing countries in the Middle East, with a population of 30 million (CDSI, 2015), where universal health coverage is of the major consideration for the Saudi Ministry of Health. Pain as a definition is vary, and nurses attitude toward handling with patients is ambiguous.

The information available about nurses' competency in pain management is very limited, and there are very paucity studies explored this area in Saudi Arabia, more specifically in Riyadh.

This cross-sectional study evaluated nurses' attitude and knowledge regarding pain management in five tertiary hospitals in Riyadh. Moreover, the researcher explored barriers to pain management facing nurses in KSA between 500 nurses from 5 tertiary health care facilities in Riyadh governance. Participated in the study where baseline information about nurses' level of knowledge and attitudes regarding pain management in KSA were collected, as well as pain (gender, level of education, nationalities, and others) management barriers explored. Finding shows significance difference between different nurses

A second phase of the current experimental study is to test educational program effectiveness in improving Saudi nurses' knowledge and attitudes, pain management will be conducted. Where workshop will be designed and delivered to randomly selected nurses, and then the effect of this workshop on nursing knowledge regarding pain management will be measured.

Findings, hopefully of this study would improve the quality of nursing care provided for patients.

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NON-PHARMACOLOGICAL INTERVENTIONS TO PREVENT DELIRIUM IN THE INTENSIVE CARE UNIT

Alanoud Alharbi, Indiana University of Pennsylvania

ABSTRACT

Delirium in ICU patients is exceedingly common and it has been associated with serious adverse patients' outcomes such as increased morbidity, mortality, length of hospital stay, and healthcare costs. It is defined as a syndrome characterized by acute and sudden onset of cerebral dysfunction with a change or fluctuation in baseline mental status, inattention, and either disorganized thinking or an altered level of consciousness. Delirium develops in 20 to 50% of lower- severity ICU patients or those not receiving mechanical ventilation, and in 60 to 80% of ICU patients receiving mechanical ventilation. Non-pharmacological interventions such as reorientation, sleep promotion, and mobilization have been found to decrease the incidence and duration of delirium during hospitalization. Bedside nurses can easily integrate delirium monitoring into the routine neurologic assessment of ventilated and non-ventilated ICU patients. The most common used tool to diagnose delirium in ICU patients is the Confusion Assessment Method for the ICU (CAM-ICU). Implementing a delirium prevention plan and screening tool to detect delirium in ICU patients is vital to improve patients' outcomes and decrease harm.

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RESISTANCE TO CHANGES IN HEALTHCARE SETTINGS

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ABSTRACT

The pace of clinical research in healthcare has increased dramatically in the last years. The indications from these researches present the health practice with large number of new evidence-based practice (EBP) guidelines and technologies. The healthcare organizations response by introducing changes through new policies and projects. The aim of the change is to keep the promise of pursuing high quality of care, safe environment, better outcomes, and cost reduction to the clients and staff. Despite well-intended change strategies, approximately 70 percent of all change projects fail, leading to frustration, increased cost, wasted time, resources, and energy (Pieterse, Caniels, Homan, 2012). Nurses' resistance is one of the obstacles that lead to failure of change initiatives. Since, change drastically influences the way in which nurses' practice is done, the resistances arises due to different attitudes such as lack of information, trust, or fear. This leads to different levels of consequences affecting both the organization and the nurses. Because of that, change cannot be sustainable unless it is accepted by all nursing levels, and implemented as a result of collaboration. Otherwise, it will be permanent only while the driven force is available. Through a better understanding of the resistance's sources and their consequences on the organization and staff, this paper aims to explain the elements that drive change's success using Lewin's theory as a framework. It discusses planning for the change as shared opinions by including all the affected parties and identifying nurses' awareness and perception toward that change. In addition, the paper will also examined the importance of evaluation and fellow-up to maintain sustainable change, assessing the continuity of resistance, and modifying the plan when necessary. The main significant behind this project is smoothing the way toward running high quality of care and making the process of implementing the evidence based practice more effective and less time consuming.

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HIGH FIDELITY SIMULATION GUIDELINES

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ABSTRACT

Since nursing students will be responsible for providing physical care and emotional support for patients and their families in the future, health care organizations expect that these newly graduated nurses are qualified for their future job. However, it is often difficult for most of the students to implement what they have learned during their studies to clinical setting without enough clinical experience. Thus, patient safety and the quality of care could be negatively impacted. Many studies show that High Fidelity Simulation (HFS) improves nursing students' knowledge, as well as their experience and confidence in the clinical situation, and that in turn will enhance patient safety. In addition, HFS is an effective teaching and learning strategy in bachelor nursing education to improve professional understanding and experience. Therefore, implementing this change will help health organization, universities, and nursing students through using HFS to learn in a safe environment that mimics real life situations. Overall, the goals of these guidelines are to enhance patient safety and to improve undergraduate nursing students' competencies.

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TRAINING OF THE CHARGE NURSE DELIVERS MULTIPLE BENEFITS FOR ALL MEMBERS OF THE HEALTHCARE TEAM

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ABSTRACT

Evidence-based practice and nursing experience suggests that alternative training methods are needed to cultivate a confident, proactive charge nurse to manage and lead stressful work environments. To assist with the training need for new charge nurses a preceptorship program should be developed for them. The program would educate charge nurses on how to perform their management/leadership role effectively, and the training will benefit nurses and patients alike. Research demonstrates that patient outcomes and Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores are improved when nursing units have strong charge nurses leading the way. Equipping charge nurses with essential management/leadership skills is a benefit for the healthcare organization, the nursing care unit, patients, and families. Hospital administrations will hopefully realize a positive relationship between the trained charge nurse and nursing care on the unit. A management/leadership program has many positive outcomes for the facility and the nursing unit such as cost containment, increased reimbursement, and higher patient satisfaction scores.

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ENHANCING THE QUALITY OF PATIENT CARE THROUGH INTER-PROFESSIONAL COLLABORATION

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ABSTRACT

*The paper focuses on providing developed knowledge on the best practice of management and leadership in nursing and healthcare providers. Additionally, it points out the impact of nursing collaboration with other care providers in clinical organization on the quality of care**.** The literature has proved that there is a gap in collaboration and communication involved between a multidisciplinary medical team within a clinical organization as well as between hospital and healthcare settings. This gap negatively impacts the quality of health care provided and as a result, it increases the rate of nurses' turnover. Effective collaboration helps in solving shared problems and achieving a high quality of patient care. Moreover, cooperation and communication play a crucial role within and between healthcare settings when a patient transfers from healthcare settings including nursing homes to hospitals and vice versa. In conclusion, this paper identifies the importance for providing high quality patient care through effective nursing-medical team collaboration and communication practice in clinical organizations. Thus, the provided practice will minimize the number of nurses leaving their units and professions and this is an effective implication for nursing management.*

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EFFECT OF WORKPLACE BULLYING ON NURSES AND HEALTHCARE ORGANIZATIONS

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ABSTRACT

Workplace bullying is a serious problem that affects the nursing profession. It impacts nurses, and healthcare organizations in multiple countries. Previous studies show that bullying has negative effects on nurses; it increases the physical and physiological problems and decreases nurses' performances. Some of the physical and psychological effects of bullying on nurses are headaches, heart and gastrointestinal problems, stress, irritability, anxiety, depression, and hopelessness. Furthermore, it affects nurses' performances, which leads to increase turnover rate and work dissatisfaction. Other studies also showed that bullying impacts healthcare organizations; it escalates hiring costs. Bullying decreases healthcare organizations' reputation among others and increases the cost of recruitment. The purpose of this article is to address the concept of bullying and its effects on nurses and healthcare organizations. Additionally, it will provide solutions and recommendations such as applying policies, increasing nurses' awareness of bullying, and improving communication channels between nurses and their managers or other managerial levels. Moreover, the article will highlight the importance of developing a plan. The which will help in eliminating workplace bullying, and providing a safe and positive environment for staff that lead to controlled workplace bullying, increased job satisfaction, and increased productivity.

Key Words: workplace bullying, bullying, manager, healthcare organizations.

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MINIMIZING LANGUAGE BARRIERS FOR FOREIGN NURSES AND PATIENTS

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ABSTRACT

In many countries there is an explosive growth in its healthcare system, but there are shortages in nurses because of cultural beliefs or economic issues. Some countries depend on expatriate nurses from foreign countries to work. Hearnden (2008) reported that internationally recruited nurses were more than 60% of the nursing workforce in some healthcare organizations in 2005.

The nurses who come to work in different countries have difficulties in communicating with patients and other providers. Consequently, these communication problems lead to serious effects on healthcare. The communication skills are important skills for all health professionals to provide appropriate care for patients. However, According to Al-Harasis (2013), there was a systematic review of 47 articles that indicated language barriers connected with lack of consciousness about health care benefits. Also, language barriers provided poor patient outcomes, increased use of services, poor patient satisfaction, and reduced the follow-up (Al Harasis, 2013). Even though there are some language barriers between foreign nurses and patients, there are major benefits for some nurses because it provides them some opportunities. Li, Nie and Li (2014) mentioned the advantages that foreign nurses will gain during working such as great opportunities for jobs, career development, gaining other professional expertise, improving the quality of life, and high salaries and retirement benefits. As a result, there are many ways that any organization can minimize the language barriers between patients and foreign nurses. First, Albougami (2015) recommend that educational programs for foreign nurses during the orientation period before starting work to learn other languages. Second, according to Al-Harasis (2013), he suggested using nonverbal communication such as hand gestures and facial expressions. Third, Albougami (2015) mentioned that recruited multilingual staff could help patients to get optimal health care. Fourth, hospitals should use interpreters to simplify communication with patients. The purpose of this paper is to explore issues of language barriers for foreign nurses and patients, to determine the common ways that could minimize them, and to discuss the potential implications of language barriers for foreign nurses and patients. I hope that we could minimize the language barriers between foreign nurses and patients to improve the quality of care and to increase patients' satisfaction.

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SOCIAL, CULTURAL AND EDUCATIONAL ADJUSTMENT OF INTERNATIONAL GRADUATE NURSING STUDENTS AT A STATE SYSTEM UNIVERSITY IN PENNSYLVANIA

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ABSTRACT

As the higher education institutions across the U.S. are working diligently in enhancing diversity, cross cultural experience, and enrollment of international students as a solution to the financial boredn facing higher education where the majority of these students pay full tuition, which makes them a vital component of the success of a university. Tuition, fees, food, clothing, travel, and textbooks paid for by these students put almost $22 billion dollars a year into the U.S. economy,(Hegatry, 2014) . However, the process of obtaining a visa has become more difficult for these students, and this has caused them to enroll at universities in other countries, including Canada, Australia, and England. Universities in the U.S. will need to take additional steps in order to simplify the transition for international students.

There has been an influx of international students at Indiana University of Pennsylvania (IUP) since fall 2014. This presentation will highlight IUP's efforts of providing the students with a smoother transition into America's culture, language, and education system. The department of nursing at IUP has established a provisional admission program for students who meet all requirements for admission except proof of English language proficiency. Provisionally admitted graduate students must enroll in the American Language Institute (ALI), where most students will take full-time English classes. Advanced students may be offered admission to the Graduate Bridge program, in which they may take up to six credits of IUP course work in addition to ALI classes. These students are given one calendar year to retake the TOEFL or IELTS to meet the requirements for their program, or successfully complete the Graduate Bridge program through the ALI. IUP's Master in nursing also accepts a license from the students' country of origin, since our program is focused on education and administration and involves no direct patient care. Waiving the requirement of state board license, gives more student's opportunity to obtain their master's degree at IUP. Adjustments to our program have been made to create a face-to-face class room experience in cohort fashion for the international students to enhance their cross cultural experience, and social interaction with other students.

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STRATEGIES TO INCREASE ENROLLMENT OF HISPANIC STUDENTS IN ALLIED HEALTH AND NURSING PROGRAMS

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ABSTRACT

Research indicates that there is a deficit of minority health care providers in the United States, which is partially due to limited diversity among applicants to health sciences programs. Increasing the proportion of minority health providers to more effectively reflect the communities served has been identified as a strategy to reduce health disparities (Fleming et al., 2005). Research has also demonstrated that health outcomes are improved when there are similarities in ethnic representation of health care providers and the patients served (Drake & Lowenstein, 1998). Increasing the numbers of Hispanic students enrolled in health care programs may be one way to improve health outcomes in the United States, particularly in communities with high numbers of Hispanic residents. With the continued growth of the Hispanic population in the United States along with data indicating that there is a direct correlation between lack of cultural diversity of healthcare employees and health disparities, the number of Hispanic students enrolling in nursing and allied health programs needs to be increased (Cason et al., 2008; Fleming, Berkowitz, & Cheadle, 2005).

Although efforts have been made in certain communities, colleges and universities continue to have low numbers of Hispanic students (Reyes & Nora, 2012). In order to increase the number of Hispanic students who enroll in nursing and allied health programs, it is important to identify contributing factors. The purpose of this presentation is to present the results of the literature review, identify perceived barriers, and ascertain factors that may contribute to enrollment of Hispanic Students in Allied Health and Nursing Programs.

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A STUDY ASSESSING HOME HEALTH NURSES' FROM A CARATIVE PERSPECTIVE

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A STUDY ASSESSING HOME HEALTH NURSES' FROM A CARATIVE PERSPECTIVE

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ABSTRACT

Background: *Due to the aging population within the United States there is an increasing need for home health nurses to understand and employ communication from a caring perspective.*

Methods: *A descriptive, quantitative study was used to try to predict home health nurses' communication from a caring perspective. A total of 71 home health nurses who were randomly selected, responded to the demographic and CNPI-70 survey.*

Results: *Experience was a strong predictor in total caring. As was hypothesized, all relationships were positive.*

Conclusion: *The study also reinforced the need for health professionals to be educated in the areas of care.*

INTRODUCTION

Baby boomers account for eighty million people in the population of the United States, and the majority of these people would like to remain in their homes (Coughlin, Pope, & Leedle, 2006). The number of older Americans is growing at a fast rate and the number of nurses who care for these people is not growing as fast, so health professionals must concentrate on how to close this gap. (Coughlin et al., 2006).

The metaphysical component of nursing or care is an aspect of nursing that helps to keep it alive, changing, and progressing as a profession (Watson, 1988/1999). According to Cossette, Cara, Ricard, and Pepin (2005), nurse-patient interactions have been linked to the concept of caring and this concept has been studied by many health professionals. Within the realm of understanding a connection is created, and that connection is caring. We ask ourselves, "Do home health nurses utilize a caring perspective?"

The care model utilized in this study was created by Jean Watson (1988/1999). Watson explains that there is a deeper connection between a nurse and patient, one that is not seen by the naked eye and that is difficult to quantify: that connection is caring (1988/1999). Watson developed ten carative factors to clearly describe the nurse-patient relationship. These ten carative factors were identified to describe how clinical activities and a therapeutic relationship work together to produce care (Cossette et al., 2005). Watson's lens of caring allows the world to understand the authentic connection or care that exists within nurse-patient relationships.

The first of the ten carative factors is a humanistic- altruistic set of values (Watson, 1988/1999). This construct was designed to explain that caring like nursing is a human science; as such, it cannot be described or performed by a specific set of directions. The second construct is faith- hope (Watson, 1988/ 1999). This concept was included in order to explain that caring is something that both parties (nurse and patient) must believe.

Sensitivity to self and others is the third construct of Watson's (1988/1999) ten carative factors. In order for a person to be productive in any relationship, that person must understand themselves first (Watson, 1988/ 1999). The fourth construct that Watson (1988/1999) describes is a helping- trusting, human care relationship. This paradigm means that both parties must show conviction in the extraordinary prospects of the benefits of participating fully in the relationship (Watson, 1988/ 1999). Expressing positive and negative feelings is the fifth construct of Watson's (1989/1999) ten carative factors. In order for a caring relationship to exist, both parties must be honest and share their true feelings and emotions with themselves, and the other party (Watson, 1988/1999).

The sixth construct of Watson's (1988/1999) ten carative factors is the creative problem solving caring process. This construct requires both parties to be open to suggestions from the other as well as both parties' full commitment to thinking in ingenious ways (Watson, 1988/1999). The seventh construct of Watson's (1988/ 1999) ten carative factors is transpersonal teaching-learning. This type of relationship or merger is experienced when both parties are able to communicate an understanding of the other as unique and accept the person as a whole being. Demonstrating a supportive, protective, and/ or corrective mental, physical, societal, and spiritual environment is the eighth of Watson's (1988/ 1999) ten carative factors. The person as a whole being and a unique situation, as opposed to something that the same formula could solve every time because it is not unique (Watson, 1988/1999). Human needs assistance is the ninth carative factor Watson (1988/1999) expresses. This explains that a basic human need or the need for assistance is met, understood and exemplified by both parties (Watson, 1988/1999). The tenth carative factor that Watson (1988/1999) explains is existential- phenomenological-spiritual forces. It must be the understanding of each person involved in a carative relationship that they must respect and trust in the metaphysical in order to experience and enjoy the phenomenon(s) created by this unique connection or relationship (Watson, 1988/1999).

LITERATURE REVIEW

Nurses are predisposed to care, which is why people enter the nursing profession; while the purpose of nursing is to assist people in rekindling the balance or harmony that exists within the nurse or healthy persons (Watson, 1988/1999). Watson (1988/1999) describes caring as dynamic in that it changes and progresses constantly, as does communication; caring begins as something a person wants to do within his or her mind, and then evolves into something much larger when humans come together through communication and the common goal of improved health. Caring as described by Watson (1988/1999) is a response or a way of communicating and as such, caring has one definition; either it is achieved by communicating through this trusting reciprocal relationship or it is not achieved because the communication in the relationship broke down.

The relationship or interaction that occurs during the creation of care takes in all impressions of environment, health and views of life (Watson, 1988/ 1999). Certain things must exist within one's belief system, such as respect and yearning for the mysteries of life, the power of internal connections, and the ability to grow and change in order for caring to be achieved (Watson, 1988/ 1999). When one is depleted by the spirit, in that he or she gets caught up in being materialistic instead of being spiritual, there is a problem or illness that occurs. This illness affects our health, and we need to overcome the spiritual drought in order to be able to enter into a relationship and have it become a caring relationship (Watson, 1988/1999). The caring relationship has to be built upon openness to communicate all feelings, both positive and negative, between both parties and only when both parties are committed to this openness is it possible for transpersonal caring to occur (Watson, 1988/ 1999). A transpersonal relationship must exist in order for care to be enjoyed, meaning both parties must transcend their own phenomenological field and create a union or new phenomenological field; this process can only occur between humans that consider care as something that is to be treasured in that it is a coming together, a union of two people whose mind, soul and body merge and work together to form a unique moment that is felt and honored by both: this special moment is caring (Watson, 1988/ 1999).

In 2005, Cossette et al. (2005) set out to test the CNPI-70 scale. During the testing they decided to create a short form of the CNPI-70. The authors of the short scale put together four areas that they felt embodied the ten carative factors that Watson originally utilized to describe caring (Cossette et al., 2005). At the beginning of this study, a goal was to use the same set of items to understand caring with different clusters of populations such as nurses, nursing students and patients (Cossette et al., 2005). The results of this study found that most nursing students attained a high total caring score and most people who were surveyed were women (Cossette et al., 2005). This study also mentions that caring attitudes are understood as positive attributes for nursing students to project so

this may be an explanation for the high score of the nursing students on each of the ten subsets as well as the total caring score (Cossette et al., 2005).

In 2006 Cossette, Cote, Pepin, Ricard & D'Aoust cite the previous Cossette et al. (2005) study while utilizing priori knowledge and attempting to test the CNPI-Short Scale and its connection to the ten carative factors by surveying nursing students. This study concluded that in order to properly test Watson's view of caring it is necessary to utilize the ten carative factors and to use the CNPI-70 scale (Cossette et al., 2006). Cossette et al. (2006) also concluded that the short form was useful for clinical research, especially for use with patients who may be unable to handle the much longer survey.

Cossette, Pepin, Côté and de Courval, (2007) set out to measure the construct validity of the CNPI-(Short Scale) by grouping the ten carative factors into four domains. This study concluded that the CNPI-(Short Scale) fit the sample data while it did not find its sample population to be representative of all nurses in clinical practice because some nurses had previously obtained RN degrees, and were working and some identified as students (Cossette et al., 2007).

CONCLUSION

The purpose of this study was to examine the predictive ability of age, experience, and credentials on the use of caring by home health nurses. Caring studies have been conducted previously and this study reports on the total caring scores of home health nurses using age, credentials, and years of experience as predictors.

The findings of this research study are similar to that of Cossette et al. (2005) which made the first attempt at developing a shorter form of the CNPI-70, and Cossette et al. (2006) which tested the CNPI-70. All of the aforementioned studies found a high total caring score and the majority of nurses surveyed were women; not surprising because nursing is generally a female dominated profession. The current study as well as Cossette et al. (2005) and Cossette et al. (2006) acknowledged that since the CNPI-70 is self-reported, health professionals may report positive scores in order to be viewed as a caring health professionals as was deemed possible in the methodology section of this study.

The total caring score expressed for participants in this study was very high. This finding is not surprising as home health nurses may think of nursing as Watson (1988/ 1999) defines nursing, a caring humanistic profession. Additionally, it is assumed home health nurses understand the importance of caring concepts while preforming their duties within their profession. Each regression model was predicted correctly, as age, experience, familiarity with and use of therapeutic communication increased, so did the total caring score.

Age and experience (years) were found to be strong predictor variables for a higher total caring score, suggesting that caring is expressed more dominantly when age and experience are higher. Reasons for this finding could be that people may naturally become more caring of others while they age and as it is incorporated into training and observation of others, which comes with experience; it could also indicate an understanding of the inherent need for more quality care as they themselves age. This would explain why the older a home health nurse was the higher total caring score that they reported. The health field is considered by many to be a caring profession, so it makes sense that longevity in the home health field leads to increased caring expression within one's job. Experience as a predictor of total caring suggests that health professionals become more caring as they work in the health field, either through training or instinct. Home health professionals may also become more caring the longer they work in the health field because home health nurses experience a larger number of patients who are in need of a special caring relationship and therefore home health nurses are more apt to create an environment that welcomes the caring process as they offer unique and specialized caring practices to a variety of patients to meet special needs.

STUDY LIMITATIONS

There were several limitations within this study. The first limitation is that the participants were all from the home health sector; therefore the findings of the study are only generalizable to the home health nursing population, essentially threatening external validity outside this specific profession. The same questions of caring still exist for nurses employed in other settings.

Limitations also existed within the methodology of this study. The methodology did not control for the uneven distribution between males and females in the nursing profession nor in home health care. It is difficult to generalize these findings to men due to the low sample of men obtained for the study. A future direction of research in this area would be to obtain a more accurate picture of the gender differences in communication within the health care profession. An additional limitation of offering $20 gift cards existed, the gift cards were offered due to the low positive response rate from home health agencies.

Observation techniques for deciding whether or not a nurse embodies the ten carative factors may provide more realistic data because of the self-reported nature of this study and the other studies associated with nurses and the CNPI-70. Studies using the CNPI-70, while time consuming, are important to preserve and support Watson's body of literature explaining the ten carative factors. Future research surveying nurses employed in various medical areas utilizing the CNPI-70 would be helpful to obtain a more holistic view of the caring theory. Research involving the CNPI-70 and the CNPI-(Short Scale)'s abilities to predict patient outcomes is a huge area that needs to be addressed, so that care theory may be more widely accepted and more widely taught in health professional schools. In the future it would be beneficial if all programs that train health professionals would add care theory, as Watson describes it, to their curriculum.

The high frequency with which nurses reported utilizing care are encouraging in that people should feel confident in the ability of home health nurses to care for their loved ones.

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APRN ENTREPRENEURSHIP: A SUSTAINABLE MODEL

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APRN ENTREPRENEURSHIP: A SUSTAINABILITY MODEL

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ABSTRACT

Background: *Global healthcare systems strive to meet healthcare needs efficiently, economically, and effectively. APRNs have been encouraged to correct the underutilization of their unique skill set and take significant leadership roles in health policy, planning, and provision. These healthcare industry changes have created opportunities for APRN Entrepreneurship.*

Benefits: *With APRNs now allowed to manage patient care in many states without a supervising physician, APRNs can serve the public as independent providers. Considering the shrinking number of primary care physicians available, having APRNs fill the gap alleviates this shortage.*

Barriers and Challenges*: Major barriers include the higher cost of malpractice insurance, inability to obtain hospital privileges, skepticism of physicians about the independent APRN role, statutory limitations, turf issues, and lack of APRNs business acumen. Other challenges to overcome include start-up costs for the practice, cash flow and financing an ongoing practice, accounting practices, billing, accounts receivable and collection, general and malpractice insurance for the practice and individual providers, and hiring, training and retraining competent enthusiastic personnel.*

Outcomes: *APRN entrepreneurship is rewarding, provides financial stability, freedom and flexibility, expert status, and allows APRNs to leave a legacy to the profession. In addition, the new culture of APRN entrepreneurship includes enhanced patient and staff satisfaction, profit and gains, business prosperity and maturation, economic value of innovation, and enhanced quality of care.*

Strategies: *Dual degree programs DNP/MBA in Health Care Administration programs offer s solution, they are potentially expensive, time-consuming and academically challenging**.** An APRN sustainable model provided through a certification program that offers courses in the management, marketing and financing of a private practice*

Key Words: APRN, Health Care Administration, Entrepreneurship, Sustainability

INTRODUCTION

Changes in the healthcare industry have created different entrepreneurial opportunities for healthcare professionals. The changes include the aging of the population, rising costs, and the chronicity of illnesses along with paradigm shifts from provider care to self-care and movement from the inpatient setting to outpatient or community settings. Global healthcare systems strive to meet the needs of the population efficiently, economically, and effectively. An adequately funded healthcare infrastructure that delivers relevant care and supported by a workforce suited to the population's health care needs is essential to the delivery of high quality care. Needs based, patient-centered approaches to care that employ interprofessional workforce teams are widely advocated as essential for health care systems to provide seamless, affordable, and quality care that is accessible to all.

There are widespread concerns about inappropriate skill mixes in the health workforce, difficulty recruiting and retaining staff, as well as the underutilization of some health professionals. APRNs have been encouraged to correct the underutilization of their unique skill set across the health continuum via actualizing the APRNs expertise and to take significant leadership roles in health policy, planning, and provision. The released report from the Institute of Medicine (IOM) (2010) Robert Wood Johnson Foundation Initiative indicated that nurses have an important contribution to make in "...building a health care system that will meet the demand for safe, quality,

patient centred, accessible, and affordable care" (Institute of Medicine, 2010, p.1) . In the past two decades, nurses' scope of practice has broadened considerably with the development and implementation of APRN roles. Currently, multiple care settings across the continuum of care from community or public health services and primary care, to acute care, and supportive or long-term care utilize the expanded APRN roles. In addition, there has been a market for APRN entrepreneurship.

Plenty of enterprising nurses have owned businesses over the years, but APRN entrepreneurship and business savvy is exploding in the early 21st century. With an increasing number of states within the U.S. allowing APRNs to manage patient care without a supervising physician, APRNs are realizing they can serve the public as independent medical providers. These APRNs can make house calls, open small clinics or offices, perform complete assessments, manage acute and chronic illnesses, order diagnostic test, and refer patients to appropriate specialists. Considering the ongoing consternation regarding the shrinking number of primary care physicians, especially with the rapidly aging population, having APRNs step in to fill the gap is a brilliant way to alleviate this shortage.

Entrepreneurial ventures also flourish for APRNS who combine nursing skills with specialized training in various fields of coaching. Whether APRNs coaching works with clients regarding life transitions, health and wellness, fitness or disease management, coaching is now more mainstream than ever, and it offers nurses a natural fit in terms of utilizing APRN skills in patient education, effective communication and motivational interviewing. Another venue for APRN entrepreneurship includes private concierge services that function outside of the limitations imposed by insurance companies is also a way for nurses to reach sectors of the public who desire such specialized care.

APRNs have a wide variety of unique talents and knowledge, and some have found consulting to be fruitful and remunerative form of self-employment and entrepreneurship. Nurses can create consulting practices related to quality improvement, team building, nursing management, organizational development, practice management, and human resources management in healthcare. Enterprising nurse consultants assist hospitals, universities, clinical practices and legal firms on a multitude of topics. Some examples of APRN consultation includes assistance with accreditation standards, curriculum design, dealing with work place violence and creating positive workplace cultures. A myriad of nurses with an entrepreneurial mindset apply themselves to freelance writing becoming podcasters, bloggers, and social media managers providing an emphasis on reaching the ever-expanding nursing audience on numerous social media platforms. Whatever the venue, APRN entrepreneurship is a growing trend and require strategies to prepare APRNs with the business acumen required for sustainability and success. In this paper, we will discuss how emerging and evolving entrepreneurial roles in nursing are rising to meet the challenge of health care reforms throughout the globe, across the continuum of health care. Examined through the lens of advance practice nursing and health administration, the development of a sustainable model for APRN entrepreneurial practice will emerge to guide these visionary APRN leaders and shakers.

APRN Entrepreneurs

Entrepreneurs have control over and responsibility for an increased proportion of indirect processes of care in their roles. A professional entrepreneur thinks globally, makes decisions by consensus, knows the business, thinks big, and conducts business using a business plan. They plan, organize, finance, operate their own businesses, and they work outside of an organization. An APRN entrepreneur is an individual who identifies a patient has a need and envisions how nursing can respond to that need in an effective way, and then formulates and executes a plan to meet that need. The APRN entrepreneurs have control over and responsibility for an increased proportion of indirect process of care in their roles. APRN entrepreneurs have the capability to plan, organize, finance, operate their own business, and they work outside of an organization. The APRN creates new opportunity in the world of business and assembles the resources of money, people and organization necessary to exploit that opportunity. If the APRN embraces the attributes of a professional entrepreneur, it is more likely that the business will grow.

APRNS entrepreneurs need to network with colleagues as well as consult with attorneys and accountants to set up appropriate operation systems. Character strengths conducive to business success include the possession of excellent interpersonal skills, critical think skills, collaboration skills, and credibility. Entrepreneurs need to know their passion, learn to be persistent, be patient, and connect with other people. Networking with people is one of the cheapest marketing strategies and can be most effective in advancing the business.

Nurse entrepreneurs should have specific personal characteristics, excellent interpersonal skills, and business acumen. Personal characteristics of nurse entrepreneurs include independence, flexibility, assertiveness, accountability, creativity, and vision. They should also have a drive to achieve, ability to accept and thrive on change, ability to handle stress, and appetite for hard work, discipline, good judgment, independence and self-confidence. The ability to be alone, work alone, and make decisions alone, and manage the time alone with a high level of energy, enthusiasm, and commitment to their work shape nurse entrepreneurs (Porter-O'Grady, 1998). Interpersonal skills include excellent communication skills, capability to listen, and the ability to manage conflict, the ability to market oneself.

Nurse entrepreneurs have to combine nursing skills with business acumen not emphasized or taught in nursing schools. Partnerships and practice management skills are essential. Technological advancements have taken an important role in the domain of healthcare and hence, technical skills do give strong advantage to nurse entrepreneurs. APRNs have essential attributes and skills that mirror the set required of an entrepreneur. These attributes and skills prepare the APRN for roles as a leader, consultant, collaborator, advocate, negotiator, expert presenter, as well as researcher. APRNS are experts in designing, implementing, and evaluating innovative interventions. They have a solid foundation in clinical knowledge and competence in coding and billing processes. The high level of care APRNs provide support positive patient outcomes. APRNs serve as role models for other personnel in applying advanced clinic skills to patient management. The consulting and collaboration skills of APRNs can assist an organization to mobilize resources to deal with practice and/or system issues.

The major characteristics and attributes of APRN entrepreneurs are that they are a visionary, decision maker, problem solver, risk taker, self-starter and good communicator. They are self-confident, assertive, autonomous, committed, creative, determined ethical, well-organized, flexible, responsible and persistent. As an increasing number of APRNs gain confidence navigating the 21st century entrepreneurial space, we will no doubt see more full time exploration of entrepreneurial endeavors, as well as small side projects to supplement income. APRNs may not learn business skills in nursing school, but plenty of today's APRNs see the possibilities, accumulate the necessary business acumen and strike out into the workforce as nurses who offer novel and effective services provided by the most trusted professionals in the US.

BARRIERS

Major barriers of APRN entrepreneurship include the higher cost of malpractice insurance, inability to obtain hospital privileges, skepticism of physicians about the independent role of nurses, statutory limitations, turf issues among various disciplines, and lack of APRNs knowledge and skills to operate in a successful, profitable business. Other major obstacles to overcome with the start of most new businesses include getting together the start-up costs for the practice, cash-flow and financing an ongoing practice, accounting practices, billing, accounts receivable and collection, general and malpractice insurance for the practice and individual providers, and hiring, training and retraining competent enthusiastic personnel.

OUTCOMES

APRN entrepreneurship can be very rewarding. It provides financial stability, freedom and flexibility, expert status, and allows APRNs to leave a legacy to the profession. Other positive outcomes related to the culture of entrepreneurship include enhanced patient and staff satisfaction, profit and gains, business prosperity and maturation, economic value of innovation, and enhanced quality of care.

IMPLICATIONS

There are several implications of APRN entrepreneurship. In response to the growing trend for APRNs entrepreneurship into private practice, graduate nursing programs may need to incorporate business and practice management concepts and skills into APRN education. Professional implications for APRN entrepreneurs include active participation in national and state associations to formulate Nurse Practice Acts, and enhanced knowledge of the scope of independent practice in the state where they practice.

As APRN entrepreneurs empower themselves, they simultaneously empower patients and other nurses. As they exercise more control over their practice and the healthcare resources needed by patients, they increase the

choices available to patients, and they make it possible for nurses in traditional practice environments to become more entrepreneurial. Nurse entrepreneurs are expanding their boundaries and creating new options for patients, nurses, and organizations. APRNs have been eligible for Medicare reimbursement since the passage of the Balance Budget Act of 1997. As APRNs are moving in the direction of entrepreneurship, it is important to be familiar with the roles and significance of marketing, health care administration along with the advantages, barriers and implications of independent practice.

Rarely spoken in the same sentence, 21st century practice demonstrates that the words, nursing, business and finance are not necessarily mutually exclusive. Many already understand that healthcare is a business that necessitates our understanding and involvement. It is important for the profession to dismantle any barrier that has existed between nursing, business and finance, allowing APRNs to have a voice both in the financial administration of the healthcare industry, and in the various aspects of a small private practice entrepreneurship.

With the recent rise in APRN entrepreneurship, many APRNs have found themselves in the predicament to fast track their learning curve to accumulate appropriate business acumen.

In response to the needs of APRN entrepreneurs, various resources have come into being such as training programs, books, devoted websites and business coaches specifically tailored to APRNs embarking on a business venture into private practice.

APRN and Business Venture

Now that APRNs are able to practice autonomously in many regions of the US, one may wonder what depth of business training such nurses are receiving before graduation. If an APRN student pursuing a degree has the clear intention of setting up shop as an independent provider, a considerable level of business knowledge would strongly support success. Perhaps, learning from the specific shortcomings of the medical education paradigm, the nursing profession itself stepped forward with options for APRNS seeking business savvy. Dual DNP/MBA programs now appear to be gaining ground, offering those nurses in pursuit of private practice the ability to earn a Doctor of Nursing Practice (DNP) degree along with the lessons of a Masters in Business administration. While potentially expensive, time-consuming and academically challenging, this marriage of APRN and business is a brilliant solution that can assist the APRN in achieving clinical excellence coupled with business success.

Healthcare MBA

In service to a career as a healthcare professional simultaneously functioning as a businessperson, it is also possible for interested parties to pursue a healthcare Masters in Business Administration. Searching Healthcare MBA programs online, the primary focus relates toward institutional business and finance rather than individual private practice management. However, several curricula appear to offer some courses in the management, marketing and financing of a private practice. An APRN sustainable model provided through a certification program may offer a reasonable option. There are three types of business structure: Sole proprietorship, general partnership, and corporation. To start a business, APRNS need to assess the market, determine the need for the service and develop a business plan.

APRNs can use business acumen to understand healthcare finance as a means to deeper comprehension of the realities faced by both our system and its patients. In addition, the APRN entrepreneurial colleagues can avail themselves of formal and informal methods of increasing business acumen. There are various types of APRN entrepreneurs in diverse specialties, such as acute care, gerontology, wound care and home health. Nursing and business are not mutually exclusive, and many astute nurses realize that understanding money and business does not preclude the ability to be a caring, compassionate and skilled clinician.

Sustainability Model

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TRACK
PHARMACEUTICALS

COMPARISON OF PHARM.D. DUAL DEGREES AND PHARMACY RESIDENCIES UTILIZING ECONOMIC DATA AND A PHARMACY STUDENT DIRECTED QUESTIONNAIRE

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ABSTRACT

In recent years, pharmacy schools have been producing more graduates than ever before and health care reform is using payments and quality assurance to impact health care providers' bottom lines. The net result of this is that the job market for pharmacists is getting more competitive, and ,for many employers, they are asking their pharmacists to take on roles that may requires skills to go above and beyond what is in a traditional Pharm.D. program. Continuing education opportunities such as residencies, dual degrees (e.g. MPH, MBA) and combination programs have become increasingly popular among the pharmacy profession. Pharmacy residencies are paid programs with a minimum of a 1 year (PGY1) commitment, with the potential to continue to a 2nd year in order to specialize in a certain area (PGY2). In contrast, dual degrees require tuition payments and may be completed at the same time as a Pharm. D., by utilizing summer, winter, night, or online coursework, or may take up to 2 additional years post Pharm.D. completion. Combination programs are programs that combine the two programs by offering a paid residency while also offering a Master's Degree or certificate. These programs typically take 2 years to complete.

This trend and increasing popularity of these programs is due to the increasing amount and competition among pharmacy students, cost-cutting measures in all realms of pharmacy, the recent shift in pharmacy education focus from dispensing to providing patient services and the broad scope of job opportunities that are now available for individuals with a Pharm.D. "Although the shortage of pharmacists decreased from 8.9% in 2000 to 5% in 2004, leadership positions, such as pharmacy directors and managers, experienced growth, with the percentage of vacant positions increasing from 27% in 2003 to 36% in 2004. In a 2004 study by the ASHP [American Society of Health-System Pharmacists] Foundation found that although satisfied with their jobs, 60% to 80% of the current directors, managers, and pharmacists were planning to leave their positions by 2015. Additionally, when pharmacists and pharmacy students were asked about their interest in pursuing a leadership or managerial role in the future, only 30% of pharmacists and 62% of students responded affirmatively." The primary objective of this paper is to compare the cost and time commitment of completing a PGY1 pharmacy residency compared to a number of different dual degrees (MBA, MPH, MPD, and MS in education) with a Pharm.D. Secondary outcomes such as acceptance rates, completion rates and availability of associated careers will also be assessed. Primary data will be obtained from pertinent nation databases such as ASPH, AACP, and other organizations as well as from an extensive literature review involving pharmacy, pharmacy residencies, and Master's Degree programs. The results of this paper may be useful in guiding past, current, and future pharmacy students in their continuing education opportunities as well as guide the profession.

A secondary objective is to assess current Concordia University Wisconsin pharmacy students' interest and understanding of pharmacy residencies and Pharm.D. dual degrees, and compare these to national trends, in order to improve practice at CUW. This data will be obtained via electronic and paper questionnaires distributed during class and online and will be based roughly off of a questionnaire created by CW Holtzman and NM Sifontis at Temple University. The questionnaire will include questions regarding: interest in specific dual degrees, interest in residencies, interest in combination programs, future career goals, previous degrees, and current enrollment in a dual degree. The results of this questionnaire will show whether current pharmacy students have a good

understanding of which education path is best correlated to their future career goals and will allow CUW to tailor its continuing education programs.

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PERCEPTIONS AND REALITY IN PRE-PROFESSIONAL PHARMACY ADVISING

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ABSTRACT

The "quality" of academic advising is generally characterized by two primary constructs: student satisfaction and student responsibility (Metzer, 1989; Light, 2001). An accessible and friendly advisor who builds a rapport with students will be able to provide general information, encouragement and frank assessments of student readiness for admission to professional programs, in a manner that students perceive as useful and welcome. As a result, students are satisfied with their advising experience. The second construct, student responsibility, characterizes the degree to which students implement the guidance provided by their academic advisor(s), and by extension place themselves on a trajectory that leads to academic success.

Within pre-professional health programs (including pharmacy, medicine, physical therapy, nursing, etc.), an intermediate measure of academic success is successful admission to the professional program of the student's choosing. Hence, academic advising for these students focuses directly (and indirectly) on preparing students for the admission process. This paper defines readiness for admission as its primary measure of successful," systematic academic progress" (Kramer and Gardner, 1977). Hence, any assessments of the quality of pre-professional health care academic advising, inclusive of student satisfaction and student responsibility indicators, must be framed within this general goal. In a recent paper, Davis, Haugen and Friesner (2015) adapted Shield's (1995) SERVQUAL methodology to measure the quality of academic advising within the context of a pre-professional Doctor of Pharmacy curriculum. The authors created a 13 question, 28 item survey which captures the most salient features of service quality, inclusive of both student satisfaction and (self-reported) student readiness to take responsibility for their academic development. They identified two underlying drivers of quality advising: short run advising needs and long run academic planning.

Noticeably absent from their analysis is a measure of actual student knowledge about the admissions process. Such knowledge is important, both as a final measure of actual (rather than perceived) readiness for admission, but also as a means to better understand perceptions of advising quality, whether characterized as student satisfaction and student responsibility, or as short run advising needs and long run academic planning. More pragmatically, an understanding of student knowledge about the admissions process provides crucial feedback to professional advisors to adjust the content and delivery of advising services to improve advising outcomes.

To address this issue, this manuscript assesses both perceptions and actual knowledge related to gaining admission into North Dakota State University's (NDSU's) Doctor of Pharmacy program. The program offers a 76 credit pre-professional curriculum that leads to eligibility to apply to NDSU's professional pharmacy program. It also covers the vast majority of courses required for admission at other Doctor of Pharmacy programs in the U.S., as well as other post-graduate health professions programs (medicine, physician assistant, dentistry, etc.). The survey consists of three components. The first component collects basic student demographic information. The second component utilizes Davis, Haugen and Friesner's (2015) items to assess perceptions of advising quality. In the final section, students are asked to analyze sixteen statements about the NDSU Doctor of Pharmacy Admissions process and respond whether those statements are accurate (or true), might be accurate (more information is required to provide a definitive response), or are inaccurate (or false). The survey has a relatively even mix of accurate and inaccurate responses, with slightly fewer statements that may or may not be accurate. The survey will be administered to all pre-professional students in the program at the end of October 2015, at which point all pre-professional students will have met with their advisor. Actual knowledge will be assessed using both the total proportion of correct responses, as well as binary indictors of whether or not students correctly responded to specific items. The constructs identified by Davis, Haugen and Friesner (2015) will be re-assessed and, if found appropriate, will be used as measures of perceived advising quality. Descriptive statistics, (parametric and nonparametric) hypothesis tests and correlation analyses will be used to assess the relationship between measures of actual student knowledge

and the two perceived advising quality constructs. Upon analyzing the results, suggestions will be made to improve the quality of advising offered to students, and to more closely tie student perceptions of advising with actual knowledge of the pharmacy admissions process.

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TURNING A PROBLEM INTO A SOLUTION: CURRICULAR MAPPING OF INCORRECT MULTIPLE CHOICE RESPONSES

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ABSTRACT

Most health professions programs are required by external accrediting bodies to provide evidence demonstrating that each and every skill, ability or component of knowledge delivered in the program adequately prepares students to successfully pass licensure and/or certification exams and to ultimately practice competently within that profession. As a result, many accredited health professions programs utilize curricular maps to tie course specific student learning objectives, and the assessments that measure those objectives, back to the program's curricular outcomes. While many of these course-specific objectives require higher order skills (e.g. synthesis, analysis) that use tools specific to authentic assessment (e.g. rubrics, reflective essays), other objectives in pharmacy education often require a baseline knowledge of facts and comprehension known as "remembering" and "understanding" in traditional learning taxonomies. Typically instructors teaching such foundational courses (especially those faculty members who teach large lecture courses of 50 or more students) are seen as the main users of multiple choices exams. However, in higher levels courses, especially in the pharmacy field, instructors need to ensure that certain factual knowledge as well as critical comprehension skills that are the results of hands-on activities and tasks are committed to memory so that the student (future pharmacist) can quickly integrate them in their professional decisions. Therefore, even for this level, multiple choices exams are an efficient means to assess student learning.

Because multiple choices questions typically only have one correct answer, it is also relatively straightforward to use multiple choices assessments in curricular assessment activities. Students' correct answers to specific exam questions provide evidence (as traced back through the curriculum map) demonstrating mastery of, or movement towards mastery of specific programmatic goals. Students who answer the question incorrectly display a lack of competency, although the source of the competency gap is not clear solely from these multiple choices questions.

The difficulty in multiple choices assessments lies in the interpretation of a correct response. The educational assessment literature has identified a number of potential problems with standardized multiple choices tests, including, but not limited to, teaching to the test, poorly written questions, test item bias, and placing too few questions per knowledge construct on the exam (Jackson, Draugalis, Slack, and Zachry 2002; Downing, 2002a). Most of these issues deal with errors on the part of faculty creating the assessment instruments. Other test flaws are primarily the result of the multiple choices design. Two of the most common problems with multiple choices tests (or any tests with a discrete number of pre-defined responses) are "guessing the right answer," "testwiseness," or using strategies to deduce the correct answer without actually knowing the answer (Downing, 2002a,b; Downing, 2003). When used in curricular mapping, assessments that fail to account for one or more of these flaws will report upwardly biased learning outcome metrics, and enable marginally competent students to successfully complete the course.

In this paper, we propose a simple mean to minimize the effects of each of these issues. When crafting multiple choice questions, possible responses (both correct and incorrect) can be designed to express fundamentally different thought processes and/or knowledge. Hence, a specific response on these questions will provide unique information about students' learning process. The correct response certainly indicates where gains in learning occur, but equally important is that incorrect answers indicate where learning does not occur, and specifically how, where, and why learning did not occur. Moreover, proper and premeditated question design along with the use of specialized exam administration software that randomize questions and possible responses, reduce the likelihood of testwiseness and guessing. Such software allows the instructor to map each question to specific curricular outcomes. In doing so, it is possible to identify both sides of assessment: identifying where the curriculum is

effective, and where specifically it can be improved (as opposed to simply identifying a gap in knowledge acquisition).
As an illustrative example, we implemented the proposed analysis in an "Introduction to U.S. Health Care Systems" course taught in a Doctor of Pharmacy program at North Dakota State University in 2015. This course is required of all students and is taught during the spring semester of the first professional year of the program. While the course is populated by professional pharmacy students, the course (and by extension the pilot study) is applicable to virtually every health professions program that conducts curriculum mapping and requires a course on the organization of the U.S. health care system. We focus on 20-30 questions contained in the second and third exams, which covers general information about the organization of the U.S. system, and as such would be generalizable to other professional health programs. The exams were administered using the ExamSoft (http://learn.examsoft.com/) platform, which randomizes the questions and possible responses, as well as ties each question back to the program's curricular outcomes (course objectives, ability based outcome, taxonomy). Results indicate that, when we implemented the proposed assessment design strategy the incorrect responses were more informative in identifying and addressing curricular gaps than the correct responses.

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WHAT COMPRISES EFFECTIVE RURAL OUTREACH? RECRUITING RURAL STUDENTS INTO HEALTH PROFESSIONS PROGRAMS

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ABSTRACT

Workforce literatures suggest that rural communities have difficulty creating, recruiting, and sustaining an adequate health care workforce. (Daniels, 2007) Promoting early interest in health care careers among youth from rural areas is one promising strategy for addressing the health professional shortage in such communities. (Zayas, 2006) Studies have shown that outreach programs that connect rural youth with health career exploration opportunities have been associated with the recruitment of health professionals into rural areas. While it is widely recognized that rural k-12 outreach programs are integral in addressing health professional shortages in rural areas, it is important to determine what specifically comprises effective rural outreach.

In this paper, we undertake an empirical analysis to identify the determinants of effective rural outreach within the context of programs currently established at a health professions college at a state institution. Visit data spanning a 9-year period was collected from the institution's admission office and was narrowed down to those entries where visiting prospective students from rural North Dakota communities (located 20 or more miles outside of the university community) declared interest in one of five entry level health programs (pharmacy, nursing, medical laboratory science, radiologic sciences, and respiratory care) as well as the type of visit program attended; individual visit, individual visit including a meeting with a faculty member in the students' area of interest, group university-wide visit, and group health professions college-specific visit. This data was then compared to enrollment data, which allowed us to see whether or not prospective students matriculated into the University and specifically enrolled in one of five entry-level health programs using a one-way ANOVA design.

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SUSTAINABILITY OF COMMUNITY TELEPHARMACY IN NORTH DAKOTA

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ABSTRACT

Telepharmacy is a prevalent means of providing pharmacy services in North Dakota. According to the North Dakota Century Code, the practice of telepharmacy occurs in situations where pharmacists at a "central site" (usually a community pharmacy in a community of 1,000 or more people) use real-time audio-visual technologies to oversee nationally certified pharmacy technicians, and to provide counseling to patients at a "remote site" which is usually located in a smaller community (less than 750-1,000 residents) between 15 and 90 miles from the central site.

According to the NDSU Telepharmacy Project (NDTP) website, there are 80 telepharmacies serving residents in over two-thirds of North Dakota's 53 counties (https://www.ndsu.edu/telepharmacy/). 51 of these 80 telepharmacies are community pharmacies, with the remainder (29) operating in hospital and other health-system environments. Of these 80 pharmacies, 55 are remote site telepharmacies providing health care to people in rural and medically underserved areas (MUAs). Without these telepharmacies, patients in these communities would be forced to travel significant distances to access equivalent pharmacy services, or to access health services in general.

Recent research suggests that, from an income statement perspective, hospital telepharmacies may be economically viable so long as a sufficient number of rural hospitals participate in the telepharmacy network to maintain economies of scale (Doherty-Johnsen, Friesner, Scott, Rathke and Albano, 2014). In 2008 dollars, the average community telepharmacy contributed approximately $660,712 to the telepharmacy's local economy (Friesner and Buck, 2011). While this is certainly a large dollar value, it accrues to the community, rather than the pharmacy itself. It is unclear whether this local economic impact is sufficient to sustain the financial viability of the community telepharmacy over the long run. Moreover, the impact may be unevenly distributed between the remote and central sites, in which case the impact may support both, or only one, of these sites. Thus, little is known about the long-run financial viability of community telepharmacies in North Dakota, or their long run sustainability from a community development perspective.

The premise of this manuscript is to employ valid and reliable survey techniques to assess the sustainability of community telepharmacies in North Dakota, both from a financial economic perspective and from a broader community development perspective. Economic viability is assessed using operational and financial metrics described elsewhere in the pharmacy workforce literature (for example, Murphy, Friesner, and Scott, 2011; Scott, 2009; Doucette, Kreling, Schommer, Gaither, Mott, and Pederson, 2006).

Sustainability is derived from criteria established in the pharmacy administration literature, which focuses on access to health care and patients' willingness to use community telepharmacy services (Friesner and Scott, 2009; Friesner and Buck, 2011). The 45 item survey was administered to all community telepharmacy owners or general managers participating in the NDTP during the period October-December 2015. Given the relatively small population and the nature of the survey's design, results are presented using descriptive statistics and case study methods. Primary emphasis is given to identifying the set of risk factors that place telepharmacies of being at risk for becoming unviable and/or unsustainable in the long run.

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TRACK
PHYSICAL THERAPY

FUNCTION DEPENDENT RECOVERY VERSUS TIME DEPENDENT RECOVERY IN THE RETURN TO SPORT FEMALE ATHLETE FOLLOWING ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION SURGERY: A CASE STUDY REPORT

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ABSTRACT

Many noncontact or minimal-contact sporting activities expose the female athlete to high-risk repetitious movements possibly increasing the risk for anterior cruciate ligament (ACL) injury. The risk for noncontact ACL injuries is considerably high in the female athlete and without an appropriate intervention program many of these athletes do not return to their preinjury levels of sports participation following ACL reconstruction surgery. Objectives used for return-to-sport criteria following anterior cruciate ligament reconstruction (ACLR) surgery are questionable. The aim of this case report is to evaluate a six week sport-specific plyometric exercise program in establishing the relationship between postoperative knee function and return-to-sport readiness.

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PREVALENCE OF PLANTAR FASCIITIS IN ADULT TENNIS PLAYERS: A PILOT STUDY REPORT

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ABSTRACT

Plantar Fasciitis is a painful, debilitating condition that affects many individuals and is particularly common in tennis players. It can also become a chronic condition that can cause individuals to become less active, thereby impacting their overall health and quality of life. While there have been studies done regarding the prevalence of plantar fasciitis, many of the studies have been focused on athletes in general and not specifically with regard to tennis players. Very few studies have been conducted to determine if there is a difference in rates of occurrence between male and female tennis players. With an emphasis being placed on wellness, injury prevention and management of health care costs, this study is timely and important. The potential to develop specific prevention and treatment protocols thereby improving health outcomes could be beneficial to both the community and providers.

The results of this research will be used to identify plantar fasciitis patterns, particularly in male versus female tennis players. Tools will be designed to assist with education of the tennis players so that they may potentially prevent occurrences of this painful condition along with education regarding specific treatment protocols.

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THE USE OF MUSIC THERAPY AS AN ADJUNCT TO PHYSICAL THERAPY

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THE USE OF MUSIC THERAPY AS AN ADJUNCT TO PHYSICAL THERAPY

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ABSTRACT

Pain and increased anxiety levels are often associated with participation in physical therapy. The use of music in addition to physical therapy can result in numerous physical improvements in individuals. This includes increased compliance, pain reduction, and enhanced physical performance. Use of music therapy in conjunction with traditional physical therapy has been shown to be a cost effective modality to improve patient outcomes and reduce healthcare costs. Multiple types of healthcare organizations could benefit from its use in patient care settings.

INTRODUCTION

The field of physical therapy has historically been used to treat a wide variety of physical conditions. As new research is produced, the field of physical therapy continues to expand even more and can now assist with the management of virtually any medical condition. While physical therapy can help patients make great strides in their rehabilitation, it is well known that therapy can often be a painful, anxiety provoking ordeal. The use of music therapy as an adjunct to physical therapy can help to ease these apprehensions and make physical therapy a more enjoyable experience. Research shows the use of music therapy to complement physical therapy can increase patient participation and compliance, ease psychological distresses, and can further increase the physical gains made in physical therapy for a variety of disorders in a cost efficient manner.

MUSIC THERAPY

According to the American Music Therapy Association, music therapy is "an established healthcare profession that uses music to address physical, emotional, cognitive, and social needs of individuals of all ages" (Hart, 2009, p. 221). Hart (2009) states music therapy is a complementary therapy which is "the employment of music and its elements….aimed at improving the physical, intellectual, or social functioning of people with problems associated to health or education" (p. 221). Gifford and Romo (2007) define music therapy as "interventions designed to promote wellness, manage stress, alleviate pain, express feelings, enhance memory, improve communication, [and] promote physical rehabilitation (p. 354). Hart (2009) reports music therapy may be active, in which people participate in creating music, or passive, in which individuals listen to music played by others (p. 221). Music therapy may also include writing or recording songs, improvisation, storytelling, and other activities in a group or privately (p. 221). It is stated individuals do not need to have the ability to play an instrument or understand music to reap the benefits of music therapy (p. 221). Hart (2009) reports "music therapy improves the quality of life for persons who are well and meets the needs of children and adults with disabilities or illness" (p. 221).

IMPLICATIONS FOR REHABILITATION

Physical therapy intervention can often be a long, trying process. Patients can make great gains or decline on a day to day basis. This can be frustrating for patients and can cause them to lose hope and become non-compliant. To ensure the greatest quality of care for patients, it is important for practitioners to use all means possible to keep patients motivated and optimistic. Deatrick, Johnson, and Oriel (2012) researched the effects of music to increase activity participation in patients with dementia. The authors state these patients typically present with emotions of depression, apathy, anger, and anxiety (p. 102). In patients with dementia, the cerebral cortex, which is responsible for higher level thinking, is damaged which results in these emotional outbursts. Deatrick,

Johnson, and Oriel (2012) also found patients with dementia are at a greater risk of decreased activity, but the use of music during exercise can decrease the disruptive behaviors patients exhibit, resulting in increased participation (p.103). The authors concluded music can be respected as a supplemental intervention to exercise to increase participation in exercise programs designed for elderly patients with dementia. This increase in exercise results in gains in strength, reduced risk of falls, and an improved quality of life in patients with dementia (p. 107).

Pain may be another factor that decreases a patient's compliance and motivation. When experiencing pain, it can be extremely difficult for one to concentrate on anything else. Research shows music may be an alternative for patients to focus on to decrease pain's debilitating effects. Hart (2009) researched the effect of music therapy on both adults and children with cancer. Hart (2009) states "mood and emotions may affect the intensity of pain that a person experiences and research has shown that pain perception is reduced when a person is directed away from his or her pain" (p.222). The thought is music will give patients an alternative focus and help them to relax, therefore reducing their discomfort. Hart (2009) states,

> "…music can serve as a channel through which these difficult emotions may be expressed, even while evoking memories of a more positive or pain free time in their lives. Both can ease patients' stress levels and, in turn, lessen the physical effects of stress and illness" (pg.222).

Comeaux and Steele-Moses (2013) have also examined music therapy's effects on pain in postoperative patients. The authors state unalleviated postoperative pain can cause problems such as inefficient breathing and hindered ambulation which, in turn, can result in delayed recovery and a reduction in patient satisfaction (pgs. 313-314). It is noted music therapy is considered the best non-pharmacological adjunct treatment to opioid analgesia to manage pain and anxiety (pg. 313). Comeaux and Steele-Moses (2013) concluded music therapy is an effective non-pharmacological adjunct to aid in the management of patient's pain (pg. 317). However, an interesting difference in this study is the authors found patients had an increase in pain tolerance without a decrease in anxiety (pg. 317). This demonstrates music therapy can have a positive effect on discomfort, even if a patient is not able to fully relax. This is a very important implication in the field of physical therapy, as any measures that can be taken to reduce a patient's pain should be considered.

Music therapy can also be used to treat a variety of psychological and mental disorders. This is important in the field of physical therapy as therapists do not just treat physical symptoms. Therapists must be able to treat the whole patient, not just the hole in the patient. Several disorders demonstrating physical symptoms are also characterized by some sort of mental or psychological handicap. One example is cerebral palsy. While, physical therapy addresses the physical, it can also benefit psychological distresses such as fear and anxiety. As Jun, Roh, and Kim (2012) state "Because most physical disability leads to emotional disability, rehabilitation treatment must address both physical and emotional aspects" (pg. 23). Research shows music therapy can be used to treat an array of psychological disorders, all of which a physical therapist may see. Fitzgerald and Sackett (1981) studied the effects of music in psychiatric hospitals. The authors report music therapy can be a tool which we use to communicate with a patient who has a handicap. Music therapy can help a person come back into contact with perceptual and emotional reality and increase their awareness. In some instances, music can be the only contact with reality those with severe handicaps can accept (pg. 88). It is also stated that music therapy can help patients to express the feelings they are not able to put into words and can lessen the feelings of isolation that are experienced (pg. 88).This is achieved by using music as a "dialogue" between the therapist and the patient. This relationship with the therapist can be a much needed stable influence in the life of the patient which is otherwise confused and disconcerted (pg. 88). A strong relationship between a patient and a physical therapist is vital, possibly even more so when discussing a patient who has a handicap, as these individuals are in need of a stable influence. If a patient does not trust their therapist, they are not going to be as cooperative and will not have as positive of outcomes. Fitzgerald and Sackett also report music therapy can help to develop personality and build self-confidence in these patients (pg. 88). This is crucial when it comes to physical therapy, because if patients do not believe in themselves, therapy will not be as effective.

Clare (2014) researched music's effects on reducing agitation in patients who are suffering from dementia. Clare (2014) states music therapy has already been found to be effective in relieving the symptoms of patients with anxiety and depression (pg. 190). The author further reports if a patient is exposed to stressors, such as untreated medical conditions and fatigue for example, the stress level can rise to a point that anxious behaviors and dysfunctional behaviors such as agitation can occur (pgs. 191-192). It is hypothesized that playing a patient's

preferred music will allow them to connect with the past and provide a center for attention and stimulus that the patient is capable of receiving and processing. Clare (2014) states "The recall of past memories will produce a soothing effect, which should prevent or reduce agitation. As the familiar music is played, the person's stress level is prevented from reaching and exceeding the threshold" (pg. 192). The brain structure responsible for memory and the recall of past memories is the hippocampus, which is damaged in patients with dementia. Clare (2014) reports music intervention can reduce stress and challenging behaviors by increasing a patient's enjoyment, mood, engagement, and positive human interaction (pgs. 194-195). The author concludes music is an effective non-pharmacological approach for residents, which should further be studied (pg. 195). Being able to make physical therapy a more enjoyable experience for a patient can have positive effects on their rehabilitation outcome. Because of this, practitioners should practice every means possible to provide a more positive and enjoyable experience for their patients.

Perhaps the most interesting study regarding music therapy and mental disorders comes from Matthew, Change, De may, Engstrom, and Miller (2009) in the study of a patient diagnosed with neurodegenerative generalized auditory agnosia. The authors state that generalized auditory agnosia is a rare condition in which a patient is impaired when it comes to recognizing sounds in spite of having adequate hearing as measured by standard audiometry (pg. 249). Auditory stimuli are processed in the temporal lobe of the brain. What is most interesting about this patient is that even though he suffers from generalized auditory agnosia, he is able to appreciate and emotionally respond to music (pg. 255). The authors report that even though one is not capable of understanding affective intent of music, it is still possible to experience an emotional response to the music (pg. 255). Patients are more likely to be subjected to this emotional response and musically induced "chills" when listening to preferred and familiar music (pg. 256). The authors conclude it is not known what medical benefits, if any, the patient will reap from music; however, he persistently has a rewarding emotional experience to his preferred music (pg. 258). This is so important not only in physical therapy, but in all health care fields. This study demonstrates that even if a patient does not understand music, they can have an enjoyable experience from listening to it. This can improve a patient's quality of life drastically, which should always be the main goal of anyone in health care.

Music therapy can also help to increase the physical gains made in physical therapy. As research is conducted, the list of disorders that can benefit from physical and music therapy continues to expand. Baker and Weller (2011) report that music therapy as an adjunct to rehabilitative therapy is indicated for impairments caused by physical and neurological trauma such as a hip dislocation and a spinal cord injury, specific illnesses and conditions like arthritis, congenital developmental disorders such as cerebral palsy, and degenerative disorders such as Parkinson's Disease, just for some examples (pg. 44). The authors also found that music therapy was effective in the rehabilitation of gait, and gross and fine motor functioning. It is suggested that music therapy "enhances physical, psychological, cognitive, and emotional functioning within physical rehabilitation" (pg. 43). For the sake of brevity, the conjunction of physical and music therapy as treatment of neurological impairments and gait training will only be discussed in detail in this paper. However, the reader should be aware that there are several more indications for music therapy as an adjunct to physical therapy.

Paul and Ramsey (2000) report on the use of music therapy to treat patients who have sustained an injury to the brain. The authors state,

> "Music can be integrated into speech-language therapy and physical and occupational therapies, in order to develop and normalize muscle tone; improve movement patterns and eventually ambulatory ability; increase independence in activities of daily living; and to restore socialization and emotional well-being" (pg. 113)

Paul and Ramsey (2000) also state singing has been found to be beneficial in the treatment of patients with neurological impairments including apraxia, Brocha's apahasia, and dysarthria in that it increases the capacity for respiration, speech clarity, and facilitates the coordination of the muscles used during speech in patients with neuromuscular deficits (pg. 114). Brocha's aphasia, or expressive aphasia, occurs due to a deficit in Brocha's area in the brain, which is located in the left, frontal lobe and is responsible for the formation of speech. Furthermore, the frontal lobe of the brain and primary motor cortex are responsible for producing the muscle movements necessary to allow the mouth to form words. In addition to using singing to treat these conditions, the authors also suggest family

members sing to their loved one who has suffered a stroke to promote socialization and emotional expression (pg. 114).

Research conducted by Jun, Roh, and Kim (2012) studied the effects of movement music therapy on patients who had suffered a stroke. After a stroke, it is common for patients to exhibit muscle and sensory weakness on the opposite side of the body. As the authors point out, the quality of life that a patient has after sustaining a stroke greatly depends on the amount of function they are able to get back (pg. 22). It is reported that programs implementing both exercise and music have had positive effects on balance, strength in the legs, flexibility, ankle extension, and mood state and quality of life. Music-movement therapy has also shown gains in hand grasp strength, motor skill, and gait training in patients who have suffered a stroke. The research conducted by Jun, Roh, and Kim (2012) concluded that music-movement therapy was effective in increasing the range of motion in shoulder and elbow flexion in stroke patients. This study did not find any increases in the strength of the lower extremities, however, other studies have in addition to improvements in activities of daily living (ADLs) (pg. 28). Baker and Weller (2011) also discuss the ability of music therapy combined with physical therapy to rehabilitate the gross motor skills in patients who have sustained a stroke. It was found that these patients showed great gains in both active and passive range of motion in the ankle, wrist, shoulder, and thumb, finger and hand tapping, gait parameters, and most importantly, functional use (pg. 55). In addition to the physical gains made from executing physical therapy to music, it can also make it more enjoyable for the patient. As Jun, Roh, and Kim (2012) state, "When familiar and favored music is used for patients during their exercises, physical rehabilitation can be more tolerable and even more enjoyable" (pg. 23). As discussed earlier in this paper, this is so important in physical therapy, as the more a patient enjoys therapy, the more likely they are to be compliant, resulting in better outcomes.

Clair, Hayden, and Johnson (2009) studied the effects of rhythmic auditory stimulation (RAS) on the physical outcomes of gait training in patients who had suffered a stroke. The authors state that RAS facilitates movements that are rhythmic in nature, such as gait, and that the rhythmic beats function as external time cues to help patients regulate their motor output. It is stated that RAS is effective in persons who have been diagnosed with neurological disorders, including stroke, Parkinson's disease, and traumatic brain injury (pg. 2184). To study the effects of RAS, the authors implemented RAS as a co-treatment to physical therapy either immediately, after ten traditional physical therapy sessions, or after twenty traditional physical therapy sessions. When conducting the research, the RAS was adjusted to closely correspond to the individual patient's gait speed (cadence) and was increased to guide improvements (pg. 2186). The authors point out the importance of selecting RAS music that the patients prefers, as music influences psychophysiological responses and has the potential to increase a patient's engagement (pg. 2188). Results of the study showed that all groups, regardless of the start of RAS, showed improvements in one-limb stance, cadence, gait velocity, stride length, and posture head tilt. However, there were no improvements seen in the timed up and go (TUG) test or the functional reach test. In addition, it was found that the group who received RAS immediately showed increased gains in one-limb stance and cadence, suggesting that early intervention of RAS results in increased improvements (pgs. 2191-2192). The authors concluded that it is feasible to implement RAS into physical therapy and is practical, cost-effective as it requires little instrumentation, and quick. Furthermore, the authors determined that RAS has the capability to enhance the outcomes of gait training performed in physical therapy (pg. 2193). Baker and Weller (2011) also report that music therapy augments gait rehabilitation in that it intensifies gains made in stride length, velocity, cadence, and gait symmetry (pg. 54). In addition, the authors inform that music therapy combined with gait training can have carry-over effects and conclude that music therapy techniques are compatible with current gait rehabilitation techniques and have the potential to decrease the cost and duration of gait rehabilitation (pgs. 54-55).

Kwak and Soo Ji (2013) investigated the effects of RAS on gait habilitation in children with cerebral palsy. The authors inform us of the difference between rehabilitation and habilitation stating, "…rehabilitation refers to the restoration of a skill that was previously learned, habilitation refers to learning a new skill for the first time" (pg. 78). It is necessary for children to participate in gait habilitation because unlike adults who suffer an impairment and have already established the neural networks needed to reestablish prior function, children need to activate and strengthen these neural networks in order to learn how to walk (pg. 78). It is stated that the major gait abnormalities seen in children with cerebral palsy include muscle weakness and spasticity, which results in slower walking speeds and excessive pelvic movement in order to maintain balance (pg. 79). The brain structure that is largely responsible for balance is the cerebellum. RAS is believed to be effective due to a phenomenon known as auditory-motor synchronization. "The underlying mechanism of RAS is that when individuals walk with an auditory timing cue, several brain areas, including the cortex, cerebellum, and spinal tract, are activated to induce auditory-motor

synchronization" (pg. 79). Like the previous study, the cadence that was chosen when performing RAS was as closely matched to the patient's as possible and was increased or decreased at the discretion of the physical therapist (pg. 80). The authors point out that RAS has the potential to improve gait due to the kinematic stability that is provided with RAS and that even though the gait in patients with cerebral palsy is not rhythmical and tends to be diverse, gait pattern can be improved with the use of RAS (pg. 80). It was ultimately concluded that "rhythm, in conjunction timing or patterning, has been identified as an effective and efficient medium" (pg. 81) and that RAS has great potential for helping people with motor deficits due to cerebral palsy (pg. 81).

Pacchetti, Mancini, Aglieri, Fundaro, Martignoni, and Nappi (2000) studied the effect of music therapy when treating Parkinson's Disease. It is stated that unless hearing is totally impaired, music therapy can be experienced and appreciated even by patients who are severely physically or cognitively impaired (p. 386). Pacchetti et.al (2000) studied the effect of music therapy and physical therapy by splitting patients into two groups; one receiving music therapy and the other receiving traditional physical therapy (p. 387). Results of the study demonstrated the difference between music therapy pretest and posttest values showed a significant improvement in UPDRS-MS scores (bradykinesia, rigidity, and postural and resting tremor), especially in bradykinesia and that music therapy had a significant overall effect on bradykinesia (p. 388). Physical therapy rather than music therapy was found to be more effective when treating rigidity (p. 389). Music therapy was shown to have an overall effect on daily activities, revealing significant changes in cutting food, dressing, falling, and freezing (p. 390). Emotional well-being and quality of life were other factors enhanced by music therapy and showed improvement throughout the course of the study (p. 390). It is concluded that while physical therapy serves as a reinforcement of the motor program and improves rigidity, it is usually deficient in motivational and emotional aspects, which could explain why there is little influence on mood state and is not easily incorporated into the patient's lifestyle (p. 391). Pacchetti et.al (2000) state, "it is well known, on the other hand, that psychosocial variables, such as emotional state or psychosocial stress, strongly influence abnormalities in gait and postures and other motor performances" (p. 391) The improvements in bradykinesia may be due to the effect of external rhythmic cues, which act as a timekeeper and stabilize the internal rhythm in patients with Parkinson's disease (p. 390). The improvement in emotional variables measured in the music therapy group may be explained by the emotional impact that music therapy has on patients (p. 390). This is related to a high level of sensory stimulation and personal interaction, which suggests and connection between emotions and facilitation of movement (p. 390).

COST BENEFIT ANALYSIS

Research strongly supports the use of music therapy in conjunction with physical therapy to further increase rehabilitative gains. Gifford and Romo (2007) report the efficacy of music therapy has been demonstrated to improve pain, agitation, disruptive behaviors, communication, depression, and quality of life (p. 353). Music therapy has been shown to decrease the need for analgesics and increase the efficiency and effectiveness of staff interventions (p. 353). Studies strongly suggest "music therapy may have a direct cost benefit by reducing medication costs and improving staff utilization" (p. 353). Research demonstrates

> "The use of music for procedural support result in more successful procedures, a reduction in the use of sedation, a decrease in the length of procedures, and a decrease in the number of staff interventions with patients" (p. 354).

Romo and Gifford (2007) found a cost benefit ratio of 0.83 and when using cost per patient day, a cost benefit ratio of 0.95 when comparing hospice patients who received music therapy to those who did not. The total cost for patients who received music therapy was $10,659 while the cost for standard care patients was $13, 643, resulting in a savings of $2, 984 (p. 356). Romo and Gifford (2007) state, "the findings of this study should also be of interest to those who care for the elderly, especially skilled nursing and long-term care facilities" (p. 357). Music therapy may improve risk management as a result of decreased falls and injuries due to patient agitation and restlessness (p. 357). It is estimated that each such incident can cost skilled nursing facilities as much as $16,000 in hospital costs alone (p. 357). Decreasing patient and staff injuries would also have a direct effect on insurance premiums (p. 357). In addition, improved patient behavior should result in improved staff interactions, leading to improved working conditions, job satisfaction, and staff maintenance (p. 357).

Whitehurst, Bryan, Hay, Thomas, Young, and Foster (2011) studied the cost effectiveness of using acupuncture, another alternative therapy, to treat knee osteoarthritis. Whitehurst et.al (2011) found treatment including advice and exercise plus true acupuncture provided "a cost effective use of health care resources despite

an associated increase in costs; that is, the improvements in health-related quality of life warrant the additional resource use" (p. 636). It is stated "…cost-effectiveness evidence will not always be sufficient to effect a policy change, but the nature of the analysis identifies the intervention that is more likely to provide greater value for resources spent"(p. 636). A study conducted in the United States demonstrated a cost effectiveness of $32,000 per quality-adjusted life year when comparing patients receiving traditional acupuncture or education alone (p. 638). It was concluded that advice and exercise plus true acupuncture was favored by the difference in mean quality-adjusted life years (p. 630). Also, there is a

> "…77% probability that advice and exercise plus true acupuncture would be more cost effective than advice and exercise alone at a threshold of 20,000 British pounds sterling per quality-adjusted life years. Despite an associated increase in costs, a treatment of advice and exercise plus true acupuncture provided a cost-effective use of health care resources" (p. 630).

Lastly, the Whitehurst et.al concluded that "…an analysis of alternative cost perspectives suggested that the results are generalizable to other health care settings" (p. 630).

Livingston, Kelly, Lewis-Holmes, Baio, Morris, Patel, Omar, Katona, and Cooper (2014) found with music therapy, there was a significant improvement in some symptoms of agitation during intervention (p. 20). It is stated irrespective of agitation, music therapy twice per week for six weeks resulted in an improvement in the mean level of agitation symptoms (p. 20). Livingston et.al (2014) report the cost range for music therapy as thirteen to twenty-seven British pounds with an incremental cost per unit reduction per Cohen-Mansfield Agitation Inventory score of four British pounds (p. 62-63). A multi-component intervention was evaluated including music-based group therapy once per week for twenty-six weeks for forty – five minutes and structured teaching with a therapist once per week for twenty-six weeks for forty-five minutes with a mean group size of seven participants along with other interventions (p. 78). For each twenty-six week program, the music therapy costs incurred were thirty British pounds for a CD player and thirty British pounds for music (p. 78). The intervention showed a cost reduction of seven hundred and eleven British pounds per patient (p. 80). Livingston et.al state "the intervention had an 82.2% probability of being cost-effective at a maximum willingness to pay for a QALY (quality-adjusted life years) of £ (British pounds) 20,000 and an 83.18% probability at a value of £30,000" (p. 81).

IMPLICATIONS FOR HEALTH CARE

The costs of healthcare are ever rising. Gifford and Romo (2007) report it is difficult to provide quality patient care under tight fiscal restraints (p. 353). It is also stated expenses related to medication costs have shown an increase faster than Medicare's routine care per diem rate (p. 353). Whitehurst et.al report "the United States has shown that the aggregate annual cost of work absenteeism because of osteoarthritis exceeds $10 billion" (p. 631). Music therapy has been shown to enhance the rehabilitative gains made in physical therapy by decreasing the effect of pain (Hart, 2009) and (Comeaux and Steele-Moses, 2013), increasing patient participation (Deatrick, Johnson, and Oriel, 2012), and reducing patient agitation (Clare, 2014). Music therapy has been found effective when treating patients who have multiple medical disorders. Examples include stroke (Jun, Roh, and Kim, 2012), traumatic brain injury (Clair, Hayden, and Johnson 2009), and Parkinson' Disease (Clair, Hayden, and Johnson, 2009). Music therapy has been found cost effective in hospice care (Romo and Gifford, 2007), in conjunction with other alternative therapies such as acupuncture (Whitehurst et.al, 2011), and as part of a multi-component intervention including therapy (Livingston et.al, 2014). In physical therapy, music therapy could be put to use via MP3 players (Comeaux and Steele-Moses, 2013), or CD player and music (Livingston et.al, 2014). Comeaux and Steele-Moses (2013) report when using an MP3 player to administer music therapy,

> "…music therapy improves the postoperative experience through enhanced pain management and environmental noise satisfaction. The intervention was inexpensive and easy to implement in the clinical setting, and therefore is recommended for use in improving postoperative outcomes in other facilities" (p.318).

Music therapy has been proven to be effective and cost efficient, therefore it is recommended that physical therapy clinics utilize it in conjunction with traditional physical therapy treatments to enhance potential outcomes.

CONCLUSION

The implications for music therapy as an adjunct to physical therapy seem to be limitless. Several studies have shown that music therapy can enhance the positive effects of physical therapy. Cost-effectiveness has also been demonstrated by multiple studies and the use of music therapy as an adjunct to physical therapy may result in a decrease in overall health care costs. More studies need to be performed so effective and efficient parameters can be set for physical therapists and other health practitioners to apply music therapy as an adjunct for their patients. Current research shows us the use of music therapy to complement physical therapy can increase patient participation and compliance, ease psychological distresses, and can further increase the physical gains made in physical therapy for a variety of disorders in a cost efficient manner. Therefore, it would be beneficial for physical therapists to implement music therapy into treatment to enhance the physical gains made and also provide their patients with a more positive experience and ultimately an improved quality of life.

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PREDICTION OF CATASTROPHIC FALLING

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ABSTRACT

Background: *The Centers of Disease Control has identified falls that result in lacerations, hip fractures, or head traumas as those result in the highest likelihood of morbidity and mortality. For the purpose of study, the researchers developed a profile that was described as "Catastrophic Fall". The "Catastrophic Fall" includes fractures of the femur and pelvis and head trauma that were attributable to a falling event. The relationship between a Catastrophic Falling event and an entry in the medical record of treatment for a previous fall related injury has not been determined. It is hypothesized that a majority (>60%) of individuals over the age of 65 who have experienced a catastrophic fall related injury will have a history of previous medical treatment for other fall related injuries within a two year span. Further investigation will determine if there is a predictable pattern of injury type, frequency, or gender.*

Objective*: To determine if a majority of individuals over the age of 65 who experience a Catastrophic Fall have a history of previous medical treatment for fall related injuries.*

Design*: A descriptive study that included data from a retrospective chart review of individuals over the age of 65 who have experienced a catastrophic fall.*

Methods *The EMR of a Level 2 trauma center in Northern Illinois was queried for patients who were seen in the Emergency Department between 9/1/2012 – 8/31/2014 who experienced a catastrophic fall related to: Femur, Pelvis fracture (ICD-9 codes 808.XX, 820.XX, 821.XX) or Head injury (ICD-9 800-804 or 850-854), and the injury was related to an accidental fall (ICD-9 codes E880-E888). Through individual chart review it was determined if an individual had a recoded medical history of receiving treatment for a fall related injury within a two span.*

Results: *The data was divided into the following groups: Group A, Subgroup 1, and Subgroup 2. Group A consists of the total 326 individuals met the inclusion criteria and who have experienced a Catastrophic Fall. Subgroup 1 is composed of 90 individuals were treated in the Emergency Department for a fall related injury in the 2 years preceding the catastrophic fall event (27%). Subgroup 2 consists of the remaining 236 individuals who had no previous history of medical treatment for a fall within the 2 years preceding the catastrophic fall. Females were injured more frequently than males in all groups. Average age of 81.3. Individuals in subgroup 1 were more often injured in the Spring and Summer, while those in subgroup 2 were most frequently seen in the Winter. For subgroup 1 the average time between initial encounter and catastrophic fall is 10.9 months. The Catastrophic Falls were characterized in the major categories of injuries of the head or of the hip and pelvis. Subgroup 1 was composed of: 46% head injuries and 45% hip and pelvis injuries. Subgroup 2 was composed of: 49% head injuries and 42% hip and pelvis injuries.*

Limitations: *Review of entries in the EMR was completed by a single researcher which introduces possibility of error. Some medical records did not include E-codes.*

Conclusions: *The hypothesis was not supported, but a significant minority of individuals had been seen for fall related injury prior to the most serious event. A profile of this previous fall-Catastrophic Fall group will be compared to a group of fallers (over the same time frame) who did not go on to experience a catastrophic fall or whose entry into the medical system was with an initial catastrophic fall event. This comparison of groups will determine if a predictable pattern of presentation can be developed to aid in identification of individuals at elevated risk for Catastrophic Fall during the initial encounter in the Emergency Department.*

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TRACK
PUBLIC HEALTH

INTERRACIAL COUPLE STATUS IN RELATIONSHIP TO BIRTH OUTCOMES, 2004-2008

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ABSTRACT

Due to the growing trend in interracial marriages in the United States, the issue of birth outcomes to infants born to such couples deserves more attention and examination. Birth outcomes are important to examine to better understand the health of the population. Greater understanding and appreciate for related risk factors can also help health care and public health professionals prevent such outcomes.

The purpose of this population-based, cross-sectional, observational study is to examine the association between interracial couple status and birth outcomes (i.e. low birth weight, very low birth weight, preterm birth, very preterm birth, small for gestational age) among singleton infants delivered in the United States.
Interracial couples are defined as those in a relationship who are not of the same race or ethnic designation. Non-Hispanic white, non-Hispanic black, Hispanic, Asian, Chinese, Filipino, Asian Indian, Korean and Vietnamese races and ethnicities were included.

The analyses demonstrated that there are indeed significant differences in birth outcomes when comparing interracial couples to endogamous couples, even after controlling for confounders. Certain patterns emerged, such as having either a white or Asian partner was related to better birth outcomes while having a black or Hispanic partner was often related to worse outcomes. There appears to be a within-group heterogeneity that is occurring, and that among groups of white, black, Hispanic, or Asian (and Asian subgroup) mothers, those who have children with a certain race/ethnic group partner are different from those who are partnering within someone from their own race/ethnicity. Adverse birth outcomes are not isolated incidents that are only influenced by the characteristics of the infants' parents.

Because so many variables spanning multiple generations are having an influence on the health of parents and their children, it is important to consider the life course perspective and also apply it practically when seeking appropriate approaches, such as program planning or policy initiatives, to address adverse birth outcomes. Research into why certain interracial couple status seems to afford more protection than endogamous couple status (or vice versa) when it comes to birth outcomes utilizing a longitudinal design (i.e. following several generations) rather than a cross-sectional design may be helpful in finding the positive influences that can be translated into programs or policies that can further promote healthy infants.

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TRACK
SPECIAL SESSION

GOLDMINE IN PUBLIC HEALTH RESEARCH: UTILIZING SECONDARY DATA SOURCES

Praphul Joshi, Lamar University

ABSTRACT

Collecting quality data on a population-level for research is often times challenging, expensive and time consuming. Researchers in public health have an added advantage of utilizing secondary data sources to address several health issues, particularly chronic diseases. Federal agencies like Centers for Disease Control and Prevention (CDC) have established valid and reliable datasets that can be used not only for research, but also for teaching. Examples of established public health surveillance systems include: Behavior Risk Factor Surveillance System (BRFSS), Youth Risk Behavior Survey (YRBS), CDC Wonder (cancer statistics, HIV / AIDS and mortality data), Vital statistics data (birth and mortality indicators), Pregnancy Risk Assessment and Monitoring System (PRAMS), Community Health Status Indicators (CHSI) and Health Indicators Warehouse. Utilizing these datasets can lead to infinite possibilities in research and addressing a wide array of hypothesis. These datasets have been created using tax dollars and are available for free. Future efforts should focus on maximizing these publicly funded datasets to address public health issues rather than reinventing the wheel to collect more primary data.

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DEVELOPING A "HEALTHY" ECONOMICS RESEARCH AGENDA

Daniel Friesner, North Dakota State University

ABSTRACT

Individuals who develop successful research agendas in health economics must satisfy the interests of multiple audiences. First, they must conduct research that appeals to the traditional economics discipline (and the literatures read by the discipline), which expects extensive mathematical modelling and statistical methodologies as indicators of rigorous scholarship. Concomitantly, health economic research must also be accessible to clinicians, health administrators and policy makers, who have fundamentally different expectations about what constitutes rigorous, relevant research. Most health economists who write for both audiences address this challenge by selecting research objectives whose methods of analysis can be assessed in a manner that fits an audience. That is, certain projects require a specific modelling and/or econometric approach, which necessitates publication in an economics journal. Other ideas can be implemented using less sophisticated (yet still appropriate) mathematical and statistical methods, and which will appeal to a non-economics audience. This presentation summarizes some of the major areas of health economics research, with particular emphasis on the matching of tools and techniques used in the health economics research process to the outlets in which those manuscripts are ultimately published.

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LET'S TALK: UTILIZATION OF QUALITATIVE RESEARCH IN PUBLIC HEALTH

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ABSTRACT

The utilization of quantitative research methods in public health can provide generalized information regarding a public health issue, however, this primary data research method is unable provide the "why" something happens. And while secondary data sources are also valuable research tool, the data generated from the sources only provide a glimpse of a public health issue but the data does not necessarily provide a better understanding of these health issues. One of the basic tenets of public health is the utilization of studying a healthcare issue from its naturally occurring environment or by observation, not a clinical perspective. Qualitative research methods utilize this ideology and can provide a better understanding of the knowledge, attitudes, and/or beliefs of a particular healthcare phenomena from an individual perspective. There are several methodologies in qualitative research and all of these methods utilize the spoken word to provide more depth and details of a public health issue from an individual perspective, whether the research is a one-on-one interview or a focus group.

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TRACK
STUDENT LED PAPERS

MARKETING IN DENTAL HEALTHCARE INDUSTRY

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ABSTRACT

Evolution of dental-care system is comparatively rapid in the next 20 years than in the previous 50 years. Accordingly development should be brought in Dental Marketing plan so that there would not be any stagnation for Dental practice. Nowadays, the conventional communication channels are uneven and obsolete. One such developmental change can be implemented by introducing a Growth hacker (Application Programming Interface) API which uses strategies and tools so that distribution and display of dental practice is on a platform not the traditional website. Currently development, expansion, and sustainability of practice are API-centric but not people-centric. In the long run there can be an economic benefit to the Dental providers and society as a whole.

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FALL PREVENTION STRATEGIES AND THE NURSE MANAGER'S ROLE IN PATIENT SAFETY

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ABSTRACT

Patients fall are common and serious problem among patients while hospitalized. Often, falls are leading to negative consequences (Stenhagen, Elkstrom, Nordell, Elmstahl, 2013). It can cause serious injuries or death, especially for elderly3 patients. Hourly rounding and use some of protective measurement can help in reducing patients fall rate. Many fall risk factors have been identified in the literature. Falls are key problem in health care organizations, as they account for the largest number of reported adverse events in hospitals and often are noted as the second most frequent cause of harm for patients (Graham, 2012; Healey & Darowski, 2012; Trepanier & Hilsenbeck, 2014; Tzeng & Chang-Yi, 2012). Many of these falls can be reduced through a fall prevention strategies or management program. In fact, the nursing staff is a central tenet of developing the patient safety. Also, the nurse managers have an important role in supporting opportunities to learn from the errors and improve safety environment. So as a whole team, they are working to provide high quality care for the patients and protect patients from harm.

Key Words: systematic review, injurious falls, elderly fall prevention strategies, nurse manager role, patient safety.

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IMPROVING QUALITY OF HEALTHCARE WITH HOURLY ROUNDING

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ABSTRACT

Hourly rounding has a big impact on patient-nurse satisfaction and patient-nurse communication. Doing one-hour and/or two-hour rounding has been found to influence staff members to be more organized while practicing their daily routines and tasks. On the other hand, hourly rounding had also been found to reduce the number of patients' pressure ulcers, call light use, the number of falls, increase the patients-nurses trusting relationships, give nurses more control over their days, and allow nurses to have more time for education and documentation. Hourly rounding should be followed based on eight steps to meet the patients' comfort and needs. A few examples include checking the patients' environment, checking patients' pain and comfort level, and need of going to the restroom. Hourly rounding has generalized benefits not only for the U.S. patients and nurses, but also for all hospitals in the world, as research identified.

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SAFEGUARDING HOSPITALS FROM ARMED ATTACKS

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ABSTRACT

During armed conflict or civil disturbances, attacks on health facilities, health workers, and the patients are all too common. These attacks not only compromise the ability to deliver care and impede efforts to reconstruct health systems, but also lead to the flight of health workers whose presence at a time of social unrest is essential. This presentation aims to explore the scope and extent of the problem, the experience of providing healthcare under such apprehensive conditions, and the possible causes and dynamics of such attacks. We will also explore the mechanisms and initiatives to support health professionals serving amidst the violence, and recent initiatives by the UN General Assembly, the World Health Organization, and other entities to strengthen standards of protection and provide accountability for perpetrators of violence against health care.

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THE EFFECT OF A SPORT-SPECIFIC PLYOMETRIC TRAINING PROGRAM ON KNEE JOINT STRENGTH IN THE RETURN TO SPORT FEMALE HIGH SCHOOL ATHLETE POST ACL RECONSTRUCTION WITH A CONCOMITANT MENISCAL REPAIR: A CASE REPORT

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ABSTRACT

Young female athletes who sustain anterior cruciate ligament (ACL) injuries and wish to return to sport require a rehabilitation medical management model which addresses the pre-injury deficits of the athlete along with one which incorporates the functional needs of the sport. The purpose of this study was to assess the hypothesis that a sport-specific plyometric exercise training program can restore functional stability in the knee joint by developing sufficient eccentric muscular force production and motor control in the neuromusculoskeletal system to establish return to sport criteria for a female high school basketball athlete following anterior cruciate ligament reconstruction (ACLR) surgery.

INTRODUCTION

Background and Purpose

The anterior cruciate ligament (ACL) is among one of the most common ligaments injured in the knee (Boden et al. 2000). During the course of sports participation, especially those with a mechanical component that involve cutting, pivoting, and jumping movements, occurrences of ACL injuries in youth sports are on the rise (Voskanian 2013). The literature has shown the existence of biomechanical differences in girls and boys, which highlights the contributions that these high-risk kinematics and sudden deceleration movements' expose the female athlete to distressingly higher damaging forces possibly contributing to the exorbitant number of ACL injuries sustained each year by the athlete. Research conducted on high school basketball athletes, ages 14-19 years, showed that females are 3.79 times more likely to sustain an ACL injury compared to male athletes of the same age (Messina, Farney, and DeLee 1999). The evidence suggests variances in anatomical structures, biomechanics, and functional norms of the knee joint mainly differentiate incidence rates of ACL injuries between the sexes. One research study (Sutton and Bullock 2013). suggest that an increased quadriceps angle, smaller ACL cross-sectional area, and increased posterior tibial slope in the female knee structure significantly predispose the female athlete to injury of the ACL (Sutton and Bullock 2013).

An injury to this passive ligament can result in excessive anterior tibial translation of the knee joint, which can negatively affect the overall "functional stability" of the knee during strenuous activity participation. LaStayo and colleagues stated "when a passive ligamentous restraint is disrupted, as in an anterior cruciate ligament (ACL) injury, muscle activity is the only remaining way to prevent excessive translation of the joint (LaStayo et al. 2003).

Some studies have addressed the mechanical properties of the knee ligaments while others propose knee function is dependent on mechanisms such as muscle strength and proprioceptive feedback. Proprioceptive function is provided for by mechanoreceptors (Ruffini, Pacini, and Golgi-like joint receptors) existent in the ligament to signal for postural changes in the knee joint (Hogervost et al., 1998). Thus, deformations within the ligament can influence the afferent output and motor activity stimulation in the muscles around the knee (Michaelidis and Koumantakis 2014). The authors further suggest that the loss of feedback in the mechanoreceptors of the ACL can have a damaging effect on the force-generating capability of the quadriceps femoris muscle (Michaelidis and Koumantakis 2014) and resultant decreased proprioceptive control at the knee and ability to appropriately absorb shock. Sinkjar et al found that proprioceptive deficits may significantly add to the mechanical instability in ACL-deficient knees, and can predispose the athlete to secondary injuries (Sinkjær and Arendt-Nielsen 1991). In accompaniment, less quadriceps activation can increase strain on the ACL and predispose athletes to higher injury risk for noncontact ACL injuries.

In 2013, Hewett and colleagues research showed that 1 in 5 young, active athletes who undergo anterior cruciate ligament reconstruction (ACLR) may re-injure their knee (Hewett et al. 1996). As previously stated, when a passive ligamentous restraint is disrupted, muscle activity (particularly the eccentric component) is the only remaining way to prevent excessive translation of the joint (LaStayo et al. 2003). Implications on youth ACL injuries, long-term sports participation and functional outcomes have only recently come to light, and discussions of the role in achieving postoperative knee joint stability is now coming to the forefront in rehabilitation of ACL injuries in youth sports following ACLR. Based on current research evidence and advances in rehabilitation of sport injuries, it is critical to identify a management model for ACLR as it pertains to rehabilitation and return to sports criteria essential for the prevention of injury and re-injury rates in the female athlete population.

Clinical Significance

The literature supports the use of plyometric exercise to develop dynamic strength and body power for the improvement of competitive sport performance. An improvement in neuromuscular efficiency stems from plyometric training as well as strength, endurance and power during the training program. In consideration of the anatomical differences between the sexes, it has also been theorized that plyometric (neuromuscular) training can yield superior effects on female athletes. These effects include decreasing injury rates in female athletes through effective strengthening preparations for participation in high-level sports (Hewett et al. 1996). Basketball requires a unique blend of strength, speed, mobility, and endurance, so plyometric training can be adapted to meet the performance needs of the sport. Previous studies have shown that a plyometric training program can significantly increase neuromuscular efficiency, strength, endurance, power and performance capabilities of the knee musculature (especially hamstrings) when measured using isokinetic testing (Wilk et al. 1994). Conversely, a decrease in hamstring strength has been found to be present in female athletes who sustained ACL injuries (Myer, Ford, Barber Foss, Liu, Nick, & Hewett, 2009). It is worth noting that Urabe et al found that effective rehabilitation of the knee joint should involve activity-specific patterned conditioning programs (Urabe, Ochi, and Onari 2002).

Key Words: anterior cruciate ligament (ACL), plyometric exercise, female athlete and anterior cruciate ligament reconstruction surgery, knee joint stability and eccentric contractions

METHODS

Search Strategy and Sources of data

The literature search for this study was performed in July 2015 using the databases Pub Med, Science Direct, Cochrane Library, Medline, and Google Scholar in the English language. All search articles were reviewed by title, abstract, and screened for inclusion and exclusion criteria. Our search terms were “anterior cruciate ligament injury”, “plyometric exercise”, “female athlete AND anterior cruciate ligament reconstruction surgery”, and “knee joint stability AND eccentric contractions”.

Screening and Eligibility Criteria

The female high school athlete reported to the university Orthopedic Physical Therapy lab: Division of Physical Therapy and was screened for eligibility criteria. The athlete and parent were provided information

regarding the objective of the study, research design and known conditions. Selection criteria included: (1) primary, unilateral ACLR, (2) discharged from a traditional physical therapy rehabilitation program, (3) goal to return to sporting activity, (4) informed consent, and (5) six months postoperative status. The athlete was excluded if presented with red flags that suggested potentially serious postoperative signs/symptoms to include: (1) complains of giving-way in the postoperative knee, (2) has a persistent joint effusion, (3) abnormal pain responses reported on symptom rating form, (4) has difficulty with ambulation, (5) has a limitation of knee motion or patellar mobility, or (5) receiving physical therapy rehabilitation services under physician orders. If the subject passed eligibility criteria and gave assent/consent, the athlete was enrolled in the study.

Case Description

The subject was a 16-year-old female high school athlete. At the time of baseline assessments, the athlete had completed 12 weeks of traditional physical therapy rehabilitation following a December 2014 left knee ACLR with containment medial meniscus repair. The female athlete had been discharged from physical therapy with accompanying instructions in a home exercise program for self-management while waiting for her 9 month follow up with the orthopedic surgeon. The athlete presented for this study at 7 months post-op ACL reconstruction. A pretest and posttest control design was used. The objective of this study was to evaluate the effectiveness of a sport-specific plyometric training program in a return to sport female athlete following anterior cruciate ligament reconstruction (ACLR) with a concomitant meniscal repair.

A series of self-report questionnaires were used to assess the subject prior to participation in the plyometric training program and were given to the athlete by the primary author and filled out by the athlete and custodial parent. The primary author remained available to clarify any questions or concerns and ensure that the paperwork was completed in entirety. The self-report questionnaires were administered at baseline and following completion of the six-week plyometric circuit training program.

The plyometric training program initiated on July 15, 2015, and the athlete performed plyometric exercises 3 times per week for 6 weeks. The plyometric training program simulated sport-specific functional movements in association to the performance needs of the sport (basketball) directed toward addressing strength, speed, mobility, and endurance needs for the style of play. The exercises selected for the plyometric intervention program consisted of: (1) treadmill warm-up, (2) rope jumping, (3) single-leg star excursion drill, (4) vertical power jump, (5) side-to-side shuffles, (6) 18 inch box jumps, and (7) karaoke. The subject performed a 5 minute treadmill warm-up and the six plyometric exercises consecutively with a one minute recovery between each circuit station. A three-minute recovery allotted between circuit cycles before the start of the next cycle. A total of 3 cycles performed by the athlete at each training session. The interventions under this study commenced from July 2015-August 2015, a six week intervention program (total of 18 training sessions). After the 6 weeks of plyometric training interventions, the athlete was released from the study with no specific instructions.

After filling out baseline assessment questionnaires and completing baseline functional measures, exercise interventions followed the plyometric program outlined in Table 1. The athlete's primary goal was to be able to return to sporting activity.

Table 1. Sample of Plyometric Training Intervention Program

Plyometric Intervention Program (Weeks 1-6)				
Date: Week: Visit#:		Cycle 1	Cycle 2	Cycle 3
Aerobic Warm-up: Treadmill				
Plyometric Circuit Drills				
Rope Jumping	Bilateral			
	Alternating			
B-Single-leg Star Excursion	3 weeks (**B**eginning stage)			
A-Single-leg Hop Drill	3 weeks (**A**dvanced stage)			
Vertical Power Jump				
Side/Side Shuffles				
18" Box Jump				

Karaoke			

* 60s between stations and 3 min between cycles.

Baseline and Outcomes Assessed

The following self-report measures with acceptable reliability, validity, and responsiveness for patients with musculoskeletal disorders were given at baseline: the Short-Form McGill Pain Questionnaire (SF-MPQ) to test for and evaluate the measurement of pain. The SF-MPQ consists of 15 descriptors rated on an intensity scale as 0= none, 1=mild, 2=moderate, or 3=severe (Melzack 1987). Intensity rank values of the words chosen for sensory, affective, and total descriptors rated by the subject at baseline and follow up assessments. The Weiss Functional Impairment Rating Scale, a self-report scoring system (0-3) representing the subject's rating to emotional or behavioral problems in 6 functional areas (home, learning & work, activities of daily living, self-concept, social, and risk). Various region-specific functional tests were also used to assess the athlete's baseline function including: resting blood pressure using a sphygmomanometer, O^2 saturation using the Medstorm Finger Pulse Oximeter, and body fat composition was calculated using the TBF-300A Body Composition Analyzer (categorized and analyzed the athlete's height, weight, % body fat and blood pressure). The Berg Balance Scale (score 0-56 with higher score representing greater function and a decrease to risk for falls). The Six-Minute Walk Test (6MWT) and Borg Rating of Perceived Exertion Scale to evaluate baseline (pre-test) and completion of program (posttest) performance outcomes to cardiovascular fitness (aerobic capacity) by comparing changes attained in walking distance, heart rate and O^2 saturation after 6 minutes of walking on a metered indoor walkway. The length of the walkway was marked with turnaround points defined by cones. The distance was set at 30 meters (98 feet and 5 -7/64 inches). Immediately upon completion of the 6 minutes, during the recovery period, the subjects' heart rate, O2 saturation and blood pressure were again measured. A rating of perceived exertion (RPE) scale was used to score the subjects' perceived effort during the 6MWT (6-20 with "6" representative of least amount of effort; a rating of "20" representative of maximum effort). The Leg Symmetry Index to measure thigh circumference values of the postoperative knee for comparison to the normal contralateral knee (measured mid-patella at 3, 6, and 9 inches). Finally, Biodex isokinetic strength testing: quadriceps and hamstring to evaluate muscular performance (peak torque, work, endurance and range of motion) in assessing postoperative knee joint strength. Knee muscle testing was performed on a Biodex System 3 Pro isokinetic dynamometer at velocities of 90^0/s and 180^0/s for five maximal contractions.

At conclusion of the 6-week plyometric intervention program, outcomes assessed included all of the baseline questionnaires in addition to the various region-specific measures. The values obtained post-training were then compared to the pre-training values. Additionally, similar to assessment of the baseline outcomes, the primary author (HO) gave the outcome forms to the athlete and parent. The outcomes were extracted at the same point for the subject. Data extraction was completed by all co-authors, and the athlete was tested by the same graduate doctoral physical therapy student (co-author) throughout the six-week plyometric training program. And since each graduate student was appointed a circuit station for the counting and recording of outcomes, bias was minimized.

RESULTS

Self-Report Questionnaires Outcome Measures

Pain Assessment

The subjects' worse pain prior to participation in the invention program was assessed using the shortened McGill Pain Questionnaire. As a widely used diagnostic test for the measurement of pain, the MPQ provides valuable information on the sensory, affective and evaluative dimensions of pain experienced and is capable of discriminating among different pain problems commonly used in research (Melzack 1987). At baseline assessment, the athlete reported no pain but rated the severity of her symptoms as mild cramping and a hot-burning sensation presence in the postoperative knee. Upon follow up, no pain or descriptive characteristics of pain were rated or described on the pain questionnaire form by the athlete.

Weiss Functional Impairment Rating Scale (WFIRS)

Behavioral or emotional problems were quantified using the Weiss Functional Impairment Rating Scale questionnaire to ascertain and assess the athletes' impairment and disability levels. The questionnaire provides behavioral information specific to assessing the degree an individual's behavioral or emotional problems impact various clinically-relevant domains of functioning (Neeb and Aufdemkampe 1997). The questionnaire consists of 68 items spanning six functional domains: home, self-concept, learning & work, activities of daily living, social activities, and risky activities. The number of items in each domain is scored on a scale of 0-3, with 0 (never or not at all) to 3 (very often or very much) that best described how emotional or behavioral problems have affected the subject in the last month. This Likert-type scale considers any item rated 2 or 3 to define impairment. At baseline assessment, a total score of 3 was obtained on the WFIRS in the areas of work, life skills, and self-concept. After the 6 week intervention program, a total score of 0 was obtained at follow up evaluation to represent a clinically important change in the athlete's behavioral or emotional post injury status.

Outcome Measures of Region Specific Functional Tests

To evaluate the amount of quadriceps atrophy, thigh circumference measurements were performed at 3, 6, and 9 inches from mid-patella on the postoperative knee to help determine the degree of weakness the athlete may have as well as establish a benchmark for reevaluation following plyometric exercise interventions. The measured indexes reflect an overall increase in thigh circumference measurements for the postoperative knee. A 4.86% increase in girth was shown at 3 inches, 5.81% increase displayed at 6 inches, and 5.91% increase at 9 inches from mid-patella. Thigh circumference measurements in the normal contralateral knee showed a 2.55% decrease in girth at 3 inches, 2.25% increase at 6 inches, and no measured change was shown in thigh circumference measure at 9 inches. Table 2 summarizes thigh circumference measurements and compared to the normal contralateral knee.

Table 2.
A comparison of thigh circumferences measured in the postoperative knee and the normal contralateral knee.

Postoperative Knee Compared to Normal Contralateral Knee Thigh Circumference Measurements						
	Left			**Right**		
	Baseline	*After 6-wk Intervention*	*Change, %*	*Baseline*	*After 6-wk Intervention*	*Change, %*
3 in.	18.00	18.875	4.86% (↑)	19.625	19.125	2.55% (↓)
6 in.	21.50	22.75	5.81% (↑)	22.25	22.75	2.25% (↑)
9 in.	23.25	24.625	5.91% (↑)	25.00	25.00	0.00%

Analysis of body composition values are provided in Table 3a to indicate baseline and end of 6 weeks intervention outcomes of body mass, skeletal muscle mass, fat mass, and basal metabolic rate. The relationship between these indexes was calculated using the TBF-300A Body Composition Analyzer to evaluate the metabolic data collected following plyometric training for 6 weeks. The athlete showed an increase in skeletal muscle mass (↑ 6.07%) evidenced by the gains in thigh circumference measurements attained in the postoperative knee after training. In a recent study by Konopka et al, the authors addressed the indirect relationship of aerobic exercise training and muscle metabolism in muscle fiber recruitment and resultant skeletal muscle hypertrophy (Harber et al. 2012). From the above, the authors concluded the hypertrophy assessed in the quadriceps muscle was most likely attributed to improvements in metabolic and functional biochemical adaptations in muscle performance achieved through intensified aerobic conditioning exercises, which is consistent with the emphasis of the sport-specific plyometric training interventions.

The athletes' transition from a relative state of inactivity to a favorable trained state was evidenced by the metabolic changes attained in endurance and effects from the plyometric training interventions. Holloszy et al found that trained muscles should have a number of metabolic effects that serve to improve performance (Holloszy and Coyle 1984). The authors concluded that the muscular adaptations and muscle metabolism processes produced decreased values for body composition indexes in total fat mass (↓14.04%) and basal metabolic rate (↓0.137%), and

conversely improved values in cardiovascular fitness; resting heart rate (↓4.55%) and oxygen saturation (1%) which were assessed following 6 weeks of training (Table 3a & Table 3b). Additionally, the athlete's resting heart rate and spirometry values were very useful indicators in evaluating her level of aerobic fitness. The improvements in increased walking distances, lower resting heart rates, and spirometry values on the 6MWT strongly correlated to enhanced aerobic capacity levels following completion of the 6-week sport-specific plyometric circuit training program. As shown in Table 3c, a more efficient and healthy circulatory system (Blair 2009) was evidenced by the cardiovascular changes shown for the 6-minute walk test. These concomitant changes were consistent with advances to exercise intensity and functional performance observations during training interventions.

Table 3a.
Statistical summary of body measurement calculated from baseline and follow up data collection for the periods during the plyometric circuit-training program.

Body Composition			
	Baseline	*After 6-wk Intervention*	***Change, %***
Body Mass (lbs.)	157.2	156.6	0.38 (↓)
Skeletal Muscle Mass (lbs.)	106.74	113.22	6.07 (↑)
Fat Mass (lbs.)	50.46	43.38	14.04 (↓)
Basal Metabolic Rate (KJ)	6559	6550	0.137 (↓)

Table 3b.
Statistical analysis of Resting Cardiovascular Fitness.

Resting Cardiovascular Fitness			
	Baseline	*After 6-wk Intervention*	*Change, %*
Resting HR (bpm)	88	84	4.55 (↓)
% SpO_2	98	99	1.0 (↑)
Blood Pressure	122/72	110/70	Systolic: 9.84 Diastolic: 2.78

Table 3c.
A summation of 6MWT performance outcomes accessed from baseline and follow up data

6-Minute Walk Test (6MWT)			
	Baseline	*After 6-wk Intervention*	*Change,%*
Distance Walked (ft.)	1,884	1,970	4.56 (↑)
Heart Rate (bpm)			

Pretest	69	118	71.01
Posttest	72	92	27.78
% SpO_2			
Pretest	98	99	1.0
Posttest	99	91	8.0
Blood Pressure			
Pretest	116/64	138/68	Systolic: 18.97 Diastolic: 6.25
Posttest	120/80	132/74	Systolic: 10.00 Diastolic: 7.50

The baseline and follow up data collected from the Berg Balance tests were used to identify whether a change had occurred in the athlete's static and dynamic balance. There were no significant differences in the values on the balance test from baseline assessment and upon completion of the 6 weeks intervention program. A maximal score (56/56 points) attained by the athlete pretest and posttest evaluation.

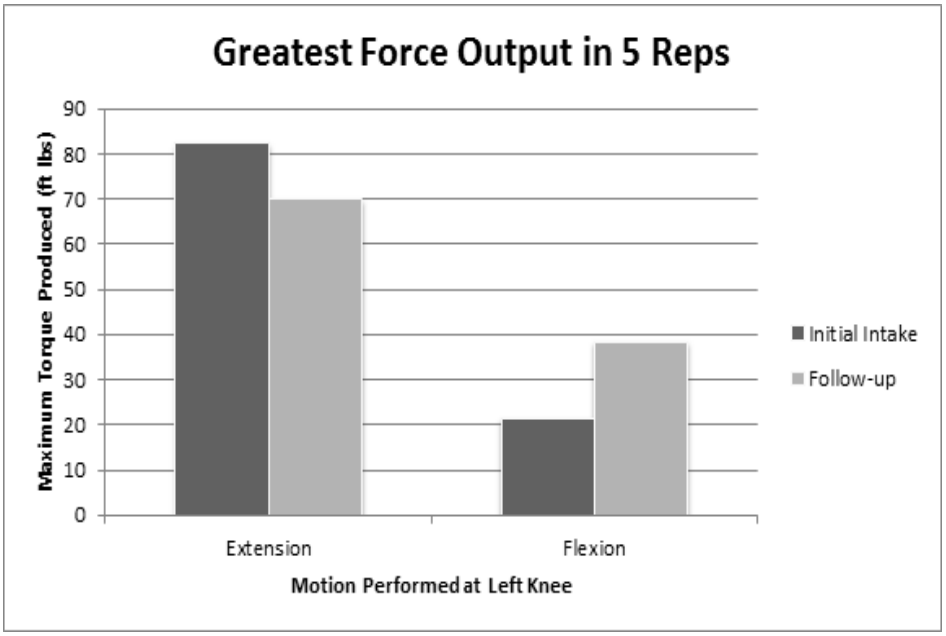
Isokinetic testing is a commonly utilized tool for the assessment of muscular strength in orthopedic and sports medicine settings (Cvjetkovic et al. 2015). For the purposed of this case study, isokinetic testing was used as a diagnostic tool to evaluate muscular strength in a young female high school athlete following an ACLR. Knee muscle testing was performed on a Biodex System 3 Pro isokinetic dynamometer at velocities of 90^0/s and 180^0/s utilizing average peak torque parameters to body weight (PT/BW) and classic hamstring/quadriceps (H/Q) ratios. The device automatically calculated the recorded parameters for average power and H/ Q ratios.

The female athlete in this study were tested for knee extension and flexion strength using the following protocol: the subject was tested in a seated position, hip flexion at 110^0 to 125^0, and stabilization straps were applied to the trunk and thighs. The resistance pad was placed at a level 3cm proximal of the medial malleolus. The range of motion (ROM) of the knee joint during testing was set from 0^0-90^0 and all limbs were gravity compensated. Bilateral isokinetic (eccentric/eccentric) knee extension and flexion studies with the protocol of 90^0/s (5 repetitions) and 180^0/s (5 repetitions) were accomplished.

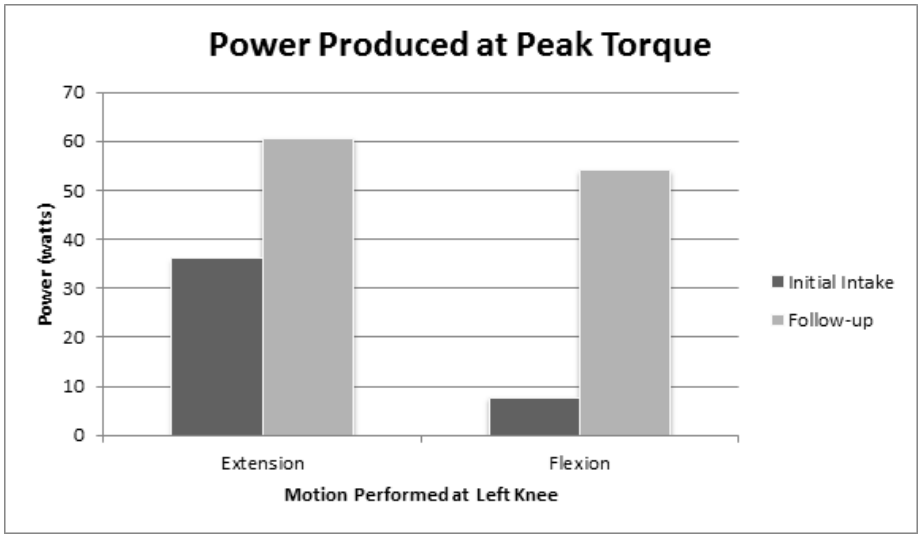
Baseline isokinetic evaluations of the postoperative knee indicated the greatest torque produced of five repetitions during knee extension was 82.4 ft. lbs., and the greatest torque produced during knee flexion was 21.5 ft. lbs. Following the completion of the sport-specific plyometric training program, the athletes' greatest produced peak force output in five repetitions for knee extension was recorded at 70.0 ft. lbs. with a peak force of 38.4 ft. lbs. in knee flexion for the isokinetic strength testing. Thus, the maximum torque produced during left knee extension decreased 15.05% and that of left knee flexion increased by 78.6%. The amount of power produced at the peak torque during concentric and eccentric contractions of the quadriceps/hamstrings both increased significantly as illustrated in Table 4 and 4a. This indicates an increased ability of the left quadriceps and hamstrings muscle groups to perform efficient work. A 68.3% increase in power during extension was exhibited along with a 602.6% increase during flexion. Power produced at peak torque during initial intake was 36 watts (W) in extension and 7.7 W in flexion. Follow-up measures indicated 60.6 W in extension and 54.1 W in flexion. Additionally, time to complete 5 repetitions decreased from roughly 9 seconds at initial intake to roughly 6 seconds at follow-up.

Table 4.
Depicts peak force output attained in a five repetition maximal speeds of 90^0/s and 180^0/s on the Biodex 3 Pro.

Table 4a.



Depicts power produced at peak torque output attained in a five repetition maximum at speeds of 90^0/s and 180^0/s on the Biodex 3 Pro.



Plyometric Exercise Interventions

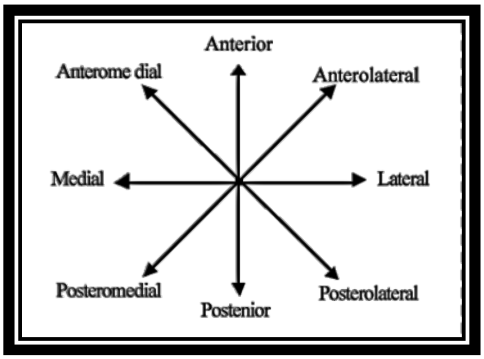
After the baseline evaluations, the subject started a 6-week supervised intervention program of sport-specific plyometric exercise training. All training sessions were supervised by a musculoskeletal physical therapist and minimal presence of three graduate doctoral physical therapy students (co-authors). Program interventions were provided 3 times a week with an appropriate duration of 45 minutes per session. For all dynamic interventions, the subject wore her medically prescribed postoperative ACL knee brace and was given verbal instructions to reinforce proper body mechanics; emphasizing maintenance of good posture, awareness knee flexion angles, soft and symmetrical landing forces to minimize impacts on the postoperative joint, and motivation to perform all exercises consistently. Feedback was constant during and after each plyometric exercise during the 6 weeks interventions.

Aerobic fitness is an essential component of fitness for basketball. A treadmill warm-up was used to progress cardiopulmonary fitness with the aim to enhance exercise tolerance and performance outcomes in the athlete. Previous studies investigating cardiovascular fitness in young athletes have shown that aerobic fitness training can have positive effects on health and behavior, ultimately leading to improvements in the athletes' sport performance. During the warm-up, the treadmill incline was kept level, distance and speed was monitored but variable. The intensity (speed) of the exercise regimen increased as tolerance and performance improved. The cardiovascular (aerobic) warm-up was performed for 5 minutes each intervention training session.

Rope jumping has been used as a rehabilitation exercise for injured athletes looking for a progressive method to get back in shape while minimizing impact (Aristoff and Stone 2012). Rope jumping strengthens muscles that support the tendons and ligaments of the knees, feet, and ankles to improve strength, power, and agility. Strengthening these supporting muscle groups reduces injury risk and contributes to recovery after injury (Aristoff and Stone 2012). In this case study, rope jumping was performed in split phases, each phase timed for 30 seconds incorporating a basic bilateral hop sequence landing on both feet followed by a scissor hop sequence-alternating lead foot during successive hops. The jump rope plyometric drill from both phases were performed for 1 minute.

The single-leg star excursion and single-leg hop drills were used for functional training mechanisms to assess dynamic postural-control (balance) and motor control strategies in the postoperative ACLR athlete. For this case study, the balance tests were performed in 2 phases during the intervention period. In the initial (beginning) phase, the single-leg star excursion drill was performed for weeks 1-3. The athlete performed a series of single-limb squats standing on the postoperative stance limb while attempting to maximally forward reach with the contralateral upper extremity and touch a point along 1 of 5 designated lines marked on the floor (Gribble, Hertel, and Plisky 2012). Each reaching direction required movements in the sagittal, frontal, and transverse planes from the subjects' maintained stable base of support marked as the center reference point. (Figure 1.) The athlete transitioned to the advance phase when she could perform the single-leg star excursion drill without visible compensations providing for improvements in dynamic postural-control, lower extremity motor control and loading capacity of the postoperative extremity. In the advanced phase, the single-leg star excursion drill was replaced by the single-leg hop drill, a more demanding dynamic postural-control balance and weight bearing activity. The dynamic postural-control drills from both phases were performed for 1 minute.

Figure 1. Represents a schematic drawing of the Star Excursion Drill.



Vertical jump ability is essential for basketball. The athlete performed a vertical power jump drill to focus on strength and power during take-off and landing mechanics. For this exercise, the athlete was instructed to perform a maximal vertical jump off 2 legs from a static standing position and land equally weighted on 2 legs while holding a Swiss Ball with both hands. The vertical power jumping plyometric drill were performed for 1 minute. Feedback was given to reinforce symmetrical landing mechanics with emphasis on more hip flexion angles during landing to lessen forces on the knee joints, particularly decreasing excessive loading stress on the capsuloligamentous tissues. Feedback provided included: do not let knees come together or pass the front of the toes, and soft landing techniques on toes first and then letting the heels come down.

To further evaluate effectiveness of the athletes' jump-landing mechanics, 18 inch box jumps were implemented in the sport-specific intervention program. For this plyometric exercise, the objectives were to

facilitate strength and explosive power in the athlete. Performed from ground level, the athlete was given instruction to "explosively" jump onto an 18 inch platform surface, starting from a crouched position; bending at the knees and hips while maintaining a straight back. Initially, the athlete required technique modifications to adjust for psychical components assessed during the backward jump landing kinematic and kinetic impacts associated with this intervention. Early in interventions for the box jump, the athlete stepped down from the 18 inch platform leading with the postoperative extremity in returning to the starting position. However, with improvements in leg strength, her ability to return to the starting position by jumping backwards off the 18 inch platform in a repeated jump-landing movement pattern advanced with training interventions and confidence. Again, feedback given to emphasize landing mechanics, with verbal cues for a soft landing on center of platform and 2 foot symmetrical jump landing mechanics.

In basketball, acceleration as well as the ability to quickly change directions are important requirements for basketball. Shuffles and karaoke were used to further address agility and balance proprioceptive deficits. A primary goal of performing these agility exercises is to increase explosive lateral movement and quick changes of direction for improvements in speed and stability requirements for the athletes' sport style of play. For this case study, the athletes' agility and balance were evaluated by incorporating movement techniques during stepping and lunging tasks (Chmielewski et al. 2006).

DISCUSSION

The effectiveness of plyometric exercise to overall sport performance improvements has been well established in the literature. This case report provides an example of how a sport-specific plyometric exercise program can be a useful clinical measurement tool to monitor strength changes following anterior cruciate ligament reconstruction (ACLR) for the athlete who wish to return to competitive sport play. The plyometric interventions in this case report involved a combination of jump training, agility and balance exercises, knee strengthening exercises, balance and control exercises to address primary fitness requirements for basketball. Components such as speed, power, endurance, and strength helped to determine the athlete's strengths and weaknesses relative to the demands of basketball. Thus, the objective of this case report was to investigate the effect of a sport-specific plyometric circuit training program on knee joint stability with a primary aim to improve the athlete's strength, endurance, agility, and power for return to sport readiness.

In this case study, the aerobic nature of basketball was considered in the design of the sport-specific training program and selection of plyometric exercises. We conclude that there were significant differences in pretest and posttest fitness components, such as speed, power, endurance, and strength following the 6 week training interventions to help identify the athlete's risk for re-injury of the knee relative to the demands of the sport. From the gathered baseline data, the athlete showed favorable outcomes in body composition indexes, 6MWT, postoperative extremity thigh circumference measurements, and isokinetic eccentric quadriceps strength. Also, we conclude that the sport-specific plyometric training led to increases shown in lean muscle mass and aerobic capacity translated into better regional-specific functional testing. The reduction in total fat mass is in agreement with the progressive improvements in the athlete's physical activity tolerance to frequency and intensity of program interventions.

Specifically, following the interventions, the athlete's postoperative extremity thigh circumference measurements showed a 6.07% increase in leg symmetry index (girth) representative of quadriceps hypertrophy. To further support these improvements, isokinetic testing data showed a significant increase in quadriceps eccentric force production by 78.6% in the postoperative knee following the 6 week plyometric exercise interventions. Thus, we conclude the change in muscle force production was credited to structural and functional changes in locomotor muscle units occurring from the eccentric-induced adaptations at the joint generated by the sport-specific functional interventions performed by the athlete in this case report. It is possible, the observed changes in the athlete's hamstring/quadriceps muscle strength testing suggest significant improvement in coactivation motor control strategies of the knee flexors and extensors. The increased motor control strategies learned during the plyometric training better allow for force/load dissipation and balance at the joint to minimize strain on the ACL (Sinkjær and Arendt-Nielsen 1991); thereby lessening the athlete's exposure of re-injury of the knee during sport participation. Previous research which has shown that plyometric exercises can impact neuromuscular adaptations and encourage greater symmetric quadriceps and hamstring coactivation for dynamic restraint (Nicole J. Chimera et al. 2004) and proprioception through facilitation of the sensorimotor system (Hole et al., 2000).

The increased isokinetic eccentric quadriceps torque output at the joint assessed after 6 weeks of intervention training were consistent with the biomechanical improvements observed in the athlete to quick movement patterns and explosive muscle-force productions shown during the training period. In particular, the athlete showed improvements in muscle-activation strategies for increased dynamic restraint and functional knee stability to enhance sport performance, and since plyometric training uses fast, powerful movement patterns, and when done properly, can improve the athlete's performance in sporting activities (Bonacci et al. 2011). The athlete's dynamic balance improved significantly with improvements in strength and proprioceptive responsiveness throughout training interventions. The dynamic postural-control balance drills were reliable in its ability to identify asymmetries between left and right lower extremities as observed with initial deficits to single-limb weight bearing during earlier weeks in the program integration.

Finally, the authors found that exercise intensity and duration of the training program added to the cardiovascular adaptations based on the activity-patterned (Urabe, Y. 2002) plyometric physical activity (Holloszy and Coyle 1984).

Case Report Limitations

A major area of focus in our study was to examine the effect of a sport-specific plyometric exercise program in this patient which we demonstrate by assessing pretest and posttest strength values of the dynamic stabilizers. While encouraging results were observed in this patient, future research to investigate the use of sport-specific plyometric training on knee joint strength should be considered in conjunction with resistance training to yield the best results for strength. Also, the interventions were only performed for 6-weeks, and a longer intervention timeframe could have provided more data in this patient, especially considering isokinetic testing outcomes. The intervention model is limited to the evaluation of a single, female athlete post ACL reconstruction; thus, it is unknown if the changes seen during testing would transfer to a larger athlete population from which to better understand the attained outcomes. This should be considered in future research to further minimize re-injury or prevent secondary injuries in the female athlete population.

CONCLUSION

In the ACL deficient knee, emphasis on functional stability brought about by muscle contractions and proprioceptive feedback is essential to maintain joint stability, especially during strenuous physical activities (Dhillon, Bali, and Prabhakar 2011) This case report provides an example of how an 6-week sport-specific plyometric exercise program targeting knee joint strength can be a useful clinical measurement tool to determine dynamic and functional stability improvements in an female athlete following anterior cruciate ligament reconstruction (ACLR). In preparing the female athlete for re-integration in a high-level sporting activity (basketball) following ACLR, these results illustrate the importance of addressing dynamic and functional measures in the rehabilitation to the extent which contribute to increases in cardiovascular endurance and hamstring-to-quadriceps peak torque ratios after ACLR. Our primary finding was that the sport-specific plyometric intervention program can provide for the activity-specific patterned conditioning to improve functional joint stability in an athlete following anterior cruciate ligament surgery and is an easily implementable method of evaluation for clinicians.

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TRACK
WOMEN'S HEALTH

AN EVALUATION OF THE NATIONAL BREAST AND CERVICAL CANCER EARLY DETECTION PROGRAM ON BREAST CANCER DIAGNOSES FOR WOMEN IN MISSISSIPPI

Melody L. Fortune, Delta State University

ABSTRACT

Background: *Public Health Law 101-354 was enacted to reduce breast and cervical cancer morbidity and mortality rates via education, screening, and adequate timely follow-up. The program has provided breast and cervical cancer screening for hundreds of thousands of women, followed by the National Breast and Cervical Cancer Early Detection Program Treatment Act, Public Law 106-354, which provided for treatment services for women diagnosed with malignant or pre-malignant conditions of the breast and/or cervix. Data were analyzed to determine whether women in Mississippi who were screened in the Breast and Cervical Cancer Program (BCCP) have been positively impacted by the enactment of this legislation by detecting breast cancer. Data were also analyzed to determine the stage of breast cancer diagnoses for women enrolled in the BCCP.*

Objectives: *By the end of the session the participant will be able to understand how public health policies via Public Laws 101-354 and 106-354 impacted women in Mississippi. Participants will also gain better insight as to what the data have shown and what have not been shown since those two laws were implemented for women in Mississippi.*

Data Analysis: *Secondary data for this study were obtained from the BCCP database for women screened over a ten year interval. The Breast and Cervical Cancer Program data were analyzed to determine the effectiveness of a public health policy that was implemented to influence breast and cervical cancer outcomes by providing a health care coverage for medically underserved women.*

Results: *Findings from this study demonstrated that as more women were screened for breast cancer more breast cancers were diagnosed. However, women in the BCCP were being diagnosed at later stages of breast cancer diseases, when the prognosis is worse.*

Biography: *Melody L. Fortune completed her Ph.D. from Mississippi State University while working full time at the Mississippi State Department of Health as the Director for the Breast and Cervical Cancer Program. She is currently the Assistant Professor in Healthcare Administration at Delta State University (DSU). She was awarded the Connected Educator Award during her first year at DSU. Prior to coming to DSU she founded the MS Witness Project; a 501(c) (3) faith based non-profit organization. She initiated the Pink Ribbon Gala in 2005, which funds raised assists those who have been diagnosed with cancer in Mississippi.*

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