Business Health Administration Association
Division of MBAA International
2020 Meeting
Chicago, Illinois

ABSTRACT AND PAPER PROCEEDINGS

PROCEEDINGS

of the
BUSINESS AND HEALTH ADMINISTRATION ASSOCIATION

CHICAGO, IL
March 25th-March 27th, 2020

2020 PROCEEDINGS EDITOR
Joey Helton, Clayton State University

2020 ASSISTANT PROCEEDINGS EDITOR
Aurora Tafili, University of North Florida

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 Officers

Dear BHAA Colleagues,

The COVID-19 pandemic that occurred in late 2019 impacted all of us personally and professionally. Some experienced the loss of a friend or family, and to those individuals the BHAA organization extends its heartfelt sympathies. All of us experienced major disruptions in virtually every aspect of our lives. One small part of this disruption included our annual meeting. For the first time in its existence, and in anticipation of the COVID-19's impact on the U.S., MBAA International canceled its 2020 annual meetings. As a result, the 2020 BHAA meetings were also cancelled.

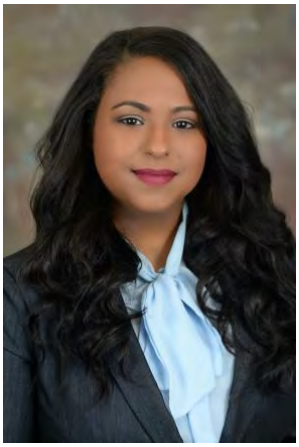
We recognize all of the time and energy BHAA members put into their papers and presentations. We cannot replace the camaraderie, networking, and learning that takes place at our conference. However, we can ensure that there is at least some positive outcome from taking the time and energy to prepare for, and to commit to participating in, the BHAA annual meetings. Therefore, the BHAA administrative team made a collective decision to publish its full conference program and proceedings, which are contained herein.

We hope that you enjoy reading the work of your colleagues in these proceedings. Perhaps more importantly, we look forward to seeing you at our next annual meeting in 2021 in Chicago!

Sincerely,

President: Hanadi Hamadi, University of North Florida
Program Co-Chairs: Daniel Friesner and Kelly Haugen, North Dakota State University
Proceedings Editor: Joey Helton, Clayton State University
Secretary: Terri Barrett, Oregon Health Sciences University
Treasurer: William Miller, University of Scranton
Executive Director: Ashish Chandra, University of Houston-Clear Lake
Past President: Marcy Butler, Clayton State University

Letter from the BHAA 2020 President



Hanadi Hamadi
University of North Florida

Dear BHAA Colleagues,

Welcome and greetings to the 2020 BHAA Annual Conference at the Palmer House in Chicago, Illinois!

I want to thank you for your exceptional efforts that you have put forth into your submissions and the presentations. I highly recommend that you attend as many of the presentations as you can, as they provide a great opportunity to share experiences and connect with others in your field.

This is will be my fifth year attending and presenting at the BHAA conference. This is one of my favorite annual conferences because you are able to network in depth with new colleagues from other colleges local and national. I look forward to meeting many of you in March.

It has been my privilege serving as your President for this year's BHAA conference. I would like to acknowledge the leadership provided by the Program Chairs Kelly Haugen and Dan Friesner. In addition, I would like to Joey Helton for compiling the proceedings manual. I would also like to thank Ashish Chandra, Kent Willis, and Aurora Tafili for their continuous support.

Again, thank you for your participation in this year's BHAA conference. I hope that you will have a wonderful learning experience and will have an opportunity to enjoy the city of Chicago.

Sincerely,
Hanadi Hamadi
President 2020

Letter from the BHAA 2020 Program Chairs

Kelly Haugen
North Dakota State University

Dan Friesner
North Dakota State University

Dear BHAA Colleagues,

Welcome and greetings to the 2020 BHAA Annual Conference at the Palmer House in Chicago, Illinois!

The BHAA meetings are a truly unique experience. Few other health administration conferences in the United States offers an integral (through the MBAA International) tie to other business disciplines as well as a unique mix of business and health-related research. The BHAA meetings are large enough to offer research in all major areas of health administration, yet small enough so that it is possible to network with all of the conference's participants. Perhaps most importantly, the BHAA is a very welcoming environment! It is a conference where one can present research that is either fully complete or in its infancy, and in all cases receive very encouraging and detailed feedback on your work. This is a major reason why we choose to return to present our work at the BHAA meetings each year.

We appreciate the opportunity to serve as Program Chairs for this year's meetings. We are especially grateful to President Hanadi Hamadi, Proceeding Editor Joey Helton and Assistant Proceeding Editor Aurora Tafili for their leadership.

Thank you again for participating in the 2020 BHAA meetings, and for being a part of these proceedings. We hope that it is an enriching experience!

Sincerely,
Kelly Haugen and Dan Friesner
Program Chairs-BHAA 2020

Letter from the BHAA 2020 Proceedings Editor

Joey Helton
Clayton State University

Dear BHAA Colleagues,

Greetings! It is my pleasure to welcome you to the 2020 BHAA Annual Conference at the fabulous Palmer House in Chicago, Illinois.

We have an incredible array of conference papers and abstracts that will be presented at this year's conference. I'd like to take a moment to express gratitude to our presenters for all of the time and effort that you have put into your research and submissions. I encourage all conference attendees to attend as many presentations as possible, as these presentations are sure to provide everyone an enjoyable learning experience.

This year's BHAA conference marks my fourth year attending and presenting. This is one of my favorite conferences! Not only do I have the opportunity to learn, but I also have the pleasure of meeting new colleagues from other colleges and universities. I am also very excited to reconnect with friends and colleagues that I have met from previous BHAA conferences.

It has been my privilege serving as your Proceeding Editor for this year's BHAA conference. I would like to acknowledge the leadership provided by President Hanadi Hamadi and the tireless work that Co-Program Chairs Daniel Friesner and Kelly Haugen have put forth. In addition, I would like to especially recognize Aurora Tafili for her extensive assistance with compiling this year's proceedings manual.

Again, thank you for your participation in this year's BHAA conference. My hope is that each of you has an enjoyable learning experience, as well as an opportunity to enjoy the city of Chicago.

Sincerely,
Joey D. Helton
Proceedings Editor-BHAA 2020

BUSINESS AND HEALTH ADMINISTRATION ASSOCIATION

MBAA INTERNATIONAL BEST PAPER AWARDS

BEST OVERALL PAPER

Analysis of Factors Determining Maternal Attitudes Towards Childhood Vaccination

Lucia Ludvigh Cintulova, St. Elisabeth University of Health and Social Work
Libusa Radkova, St. Elisabeth University of Health and Social Work

TRACK: HEALTHCARE PROFESSIONALS CLINICIANS

Assessment of Norwegian Physicians' Knowledge, Experience and Attitudes toward Medical Cannabis

John Laurence Arnfinsen, University of Oslo
Adnan Kisa, Kristiania University College

TRACK: ETHICAL/LEGAL ISSUES IN HEALTHCARE

Future of Genetic Engineering and CRISPR Technology: Ethical, Legal and Financial Considerations

Fawzaan M. Hashmi, Mankato West, Mankato

TRACK: HEALTHCARE ECONOMICS AND FINANCE

Did the CMS Value-Based Payment System Improve the Quality of Care?

Elmer B. Fos, D'Youville College
Kathleen Curtin, D'Youville College

TRACK: GLOBAL HEALTHCARE

How the U.S. Health Services Industry is (Finally) Globalizing

Blair Gifford, University of Colorado Denver

TRACK: STUDENT SUBMISSIONS

The Impact of Rural Hospital Closures and Clinical Staff Shortages on Access to Quality Health Care in Rural America: Issues and Strategies for Improvement

Solomon J. Yniguez, University of Houston – Clear Lake
Ashish Chandra, University of Houston – Clear Lake

TRACK: HEALTHCARE EDUCATION

Attitudes of Pharmacy Students toward Gun Violence on Campus

Ateequr Rahman, Rosilind Franklin University
Yelena Sahakian, Rosilind Franklin University

TRACK: HEALTH INFORMATICS AND TECHNOLOGY

Telehealth: Do Alternative Payment Models Matter?

Mei Zhao, University of North Florida
Hanadi Hamadi, University of North Florida
D. Rob Haley, University of North Florida
Cynthia White-Williams, University of North Florida
Sinyoung Park, University of North Florida
Jing Xu, University of North Florida

TRACK: HEALTHCARE MANAGEMENT

The Impact of Rural Hospital Closures and Clinical Staff Shortages on Access to Quality Health Care in Rural America: Issues and Strategies for Improvement

Solomon J. Yniguez, University of Houston – Clear Lake
Ashish Chandra, University of Houston – Clear Lake

Note that student submissions were evaluated in the student section AND the relevant topic-based section

TRACK: PUBLIC HEALTH

Analysis of Factors Determining Maternal Attitudes Towards Childhood Vaccination

Lucia Ludvigh Cintulova, St. Elisabeth University of Health and Social Work
Libusa Radkova, St. Elisabeth University of Health and Social Work

BUSINESS AND HEALTH ADMINISTRATION ASSOCIATION

ABSTRACT AND PAPER PROCEEDINGS

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Blair Gifford

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Crissy Flake, and Robert Clegg

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Cynthia Naughton, Dan Friesner, and Kelly Haugen

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Daniel J. West, Bernardo Ramirez, and Cherie Lynn Ramirez

I Cheated Then and I Can Cheat Now

William "Kent" Willis

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Concentration in The Chicago Hospital Market
Anthony Paul Andrews

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Gene C. Wunder, and Judy K. Wunder

PUBLIC HEALTH

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Lucia Ludvigh Cintulova, and Libuša Radkova

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Carlos Galindo, and Ashish Chandra

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Libusa Radkova, Lucia Ludvigh Cintulova, and Betty Toth

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Abraham D. Traore, Carrie Mehringer, Anila Vadakkekalam and Payal Patel-Dovlatabadi

Safe Injection Sites Economic Impact
Steven Havrilla, Katherine Loughlin, Lea Scopelliti, and William Miller

Barriers to Post-Acute Care Dental Services
Manwa Hegde, and Daniel J. West

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Reduction of Physical and Chemical Restraints in Healthcare
Alexandra N. Latoria, and William B. Stroube

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Sarah Novak, Hillary Grove, and Robert Spinelli

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Michael F. Peters

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Aisha Tijjani, Phillip Smith, Mickayla Schulte, Sarah Joest, and Payal Patel-Dovlatabadi

HEALTHCARE QUALITY

Reducing Readmissions for Surgical Site Infections by Utilizing A Variety of Interventions
Dennis Emmett

Do Greater Budgetary Allocations to Pharmacy and Medical Laboratories Lead to Lower Hospital-Acquired Infections in Critical Access Hospitals?
Kelly Haugen, Daniel Friesner, and Matthew Mcpherson

Is It Financially Viable to Minimize Hospital-Acquired Infections? Empirical Evidence from Rural Hospitals in Washington State
Matthew Mcpherson, Kelly Haugen, and Daniel Friesner

STUDENT PANEL

Health Administration – Students' Perceptions, Concerns, Expectations and Outcomes
Crissy Flake, Carlos Galindo, Priyanka Tetali, and Solomon J. Yniguez

BUSINESS AND HEALTH ADMINISTRATION ASSOCIATION

PROGRAM

(Wednesday)
Business and Health Administration
1:30-2:45 p.m. BHAA ROOM NUMBER 1 (Dearborn 1, 7th Floor)

Theme: Healthcare Education

Chair: Daniel West, Jr., University of Scranton
Discussant: Deborah Gritzmacher, Clayton State University

A Model for Communication Skills Training in Graduate Health Education

Daniel West, Jr., University of Scranton
Bernardo Ramirez, University of Central Florida
Cherie Lynn Ramirez, Simmons University

Overcoming Obstacles in Online Education

Kelly Duffy, Daytona State College
Linda Miles, Daytona State College
Jane Rosati, Daytona State College

I Cheated Then and I Can Cheat Now

William K. Willis, Marshall University

(Wednesday)
Business and Health Administration
1:30-2:45 p.m. BHAA ROOM NUMBER 2 (Dearborn 2, 7th Floor)

Theme: Healthcare Quality

Chair: Kelly Haugen, North Dakota State University

Discussant: Ashish Chandra, University of Houston – Clear Lake

Reducing Admissions for Surgical Site Infections by Utilizing a Variety of Interventions

Dennis Emmett, Marshall University

Do Greater Budgetary Allocations to Pharmacy and Medical Laboratories Lead to Lower Hospital-Acquired Infections in Critical Access Hospitals?

Kelly Haugen, North Dakota State University
Dan Friesner, North Dakota State University
Matthew McPherson, Gonzaga University

Is it Financially Viable to Minimize Hospital-Acquired Infections? Empirical Evidence from Rural Hospitals in Washington State

Matthew McPherson, Gonzaga University
Kelly Haugen, North Dakota State University
Dan Friesner, North Dakota State University

(Wednesday)
Business and Health Administration
1:30-2:45 p.m. BHAA ROOM NUMBER 2 (Dearborn 3, 7th Floor)

Theme: Clinicians
Chair: Adnan Kisa, Kristiania University College
Discussant: Hanadi Hamadi, University of North Florida

Assessment of Norwegian Physicians' Knowledge, Experience and Attitudes toward Medical Cannabis

John Laurence Arnfinsen, University of Oslo
Adnan Kisa, Kristiania University College

MCID Change as a Protocol for Examining PT Effectiveness and Guiding Performance-Based Reimbursement

Robert Paulumbo, Northwestern University Advocate Medical Group
Michael Duchaj, Northwestern University Advocate Medical Group

How New Ways of Working are Changing the Healthcare Sector

Alexander Redlein, Vienna University of Technology
Claudia Höhenberger, Vienna University of Technology

(Wednesday)

3:00-4:15 p.m. BHAA ROOM NUMBER 1 (Dearborn 1, 7th Floor)

Theme: Healthcare Finance
Chair: William K. Willis, Marshall University
Discussant: Ashish Chandra, University of Houston – Clear Lake

Don't Cash that Check! Identifying Risks to Medical Billing and Collection Practices under the Doctrine of Accord & Satisfaction

William K. Willis, Marshall University
Casey W. Baker, Marshall University
Charles Stivason, Marshall University

Did the CMS Value-Based Payment System Improve the Quality of Care?

Elmer B. Fos, D'Youville College
Kathleen Curtin, D'Youville College

Telehealth: Do Alternative Payment Models Matter?

Mei Zhao, University of North Florida
Hanadi Hamadi, University of North Florida
D. Rob Haley, University of North Florida
Cynthia White-Williams, University of North Florida
Sinyoung Park, University of North Florida
Jing Xu, University of North Florida

(Wednesday)
Business and Health Administration
3:00-4:15 p.m. BHAA ROOM NUMBER 2 (Dearborn 2, 7th Floor)

Theme: Healthcare Information Technology

Chair: Daniel West, Jr., University of Scranton
Discussant: Dennis Emmett, Marshall University

Information Privacy and SOC2 Reporting: What All Shareholders Should Know

Marcy Binkley, Lipscomb University
Bart Liddle, Lipscomb University

The Relationship between HIPAA and Evolving Technology

Elizabeth Dennis, University of Scranton

(Wednesday)
Business and Health Administration
3:00-4:15 p.m. BHAA ROOM NUMBER 3 (Dearborn 2, 7th Floor)

Theme: Issues in Healthcare Education
Chair: Daniel Friesner, North Dakota State University
Discussant: Matthew McPherson, Gonzaga University

Implementation of a Cultural Immersion Program

Crystal Marchant, Clayton State University
Rebecca Morgan, Clayton State University
Comfort Obi, Clayton State University
Lisa Eichelberger, Clayton State University
Victoria Foster, Clayton State University
Lisa Smiley, Clayton State University
Erica Collins, Clayton State University
Deborah Gritzmacher, Clayton State University
Angela Hollis, Clayton State University

Predicting Student Performance during the First Semester of a Health Professional Program

Cynthia Naughton, North Dakota State University
Kelly Haugen, North Dakota State University
Dan Friesner, North Dakota State University

Attitudes of Pharmacy Students Toward Gun Violence on Campus

Ateequr Rahman, Rosilind Franklin University
Yelena Sahakian, Rosilind Franklin University

(Wednesday)
Business and Health Administration
4:30–5:45 p.m. BHAA ROOM 1 (Dearborn 1, 7TH Floor)
BHAA Board Meeting
Chair: Hanadi Hamadi, University of North Florida

(Thursday)
Business and Health Administration
8:00-9:00 a.m. BHAA ROOM NUMBER 1 (Dearborn 1, 7TH Floor)
BHAA Annual Business Meeting and Awards Function
Presiding: Hanadi Hamadi, University of North Florida
Co-presiding: Kelly Haugen, North Dakota State University
Dan Friesner, North Dakota State University
All BHAA members invited to attend

(Thursday)
Business and Health Administration
9:15–10:30 a.m. BHAA ROOM NUMBER 1 (Dearborn 1, 7th Floor)

Theme: Artificial Intelligence and Information Technology in Healthcare

Chair: Michael M. Costello, University of Scranton
Discussant: Mickey Skiba, Monmouth University

Artificial Intelligence in Healthcare: The State of the Reported Research

Michael M. Costello, University of Scranton

Machine Learning and Artificial Intelligence Applications in Healthcare

Jamie Pierce, University of Scranton
Brianna Windsor, University of Scranton
Robert Spinelli, University of Scranton

Application of Roger's Diffusion of Innovations Theory to Health Information Technology Implementations

Rangarajan Parthasarathy, University of Illinois at Urbana-Champaign

(Thursday)
Business and Health Administration
9:15–10:30 a.m. BHAA ROOM NUMBER 2 (Dearborn 2, 7th Floor)

Theme: Healthcare Ethics
Chair: Ashish Chandra, University of Houston – Clear Lake
Discussant: John Wiercinski, University of Scranton

A Critical Look at Issues that Create Patient-Provider Communication Breakdown – From the Perspective of Ethics, Entities Involved, and Language Used

Bandar Idris, University of Houston – Clear Lake
Ashish Chandra, University of Houston – Clear Lake

Bad Behavior and a Whistleblower Label: How to Handle the Situation
Ronald Fuqua, Clayton State University
Elliot Aronson, Emory Healthcare
Deborah Gritzmacher, Clayton State University

Future of Genetic Engineering and CRISPR Technology: Ethical, Legal and Financial Considerations

Fawzaan Hashmi, Mankato West

(Thursday)
Business and Health Administration
9:15 a.m.–10:30 a.m. BHAA ROOM NUMBER 3 (Dearborn 3, 7th Floor)

Theme: Health Informatics
Chair: Dennis Emmett, Marshall University
Discussant: Michael F. Peters, Baker College

Modeling Dimensions of Patients' Empowerment in E-Health Systems: Personal, Social and Medical

Muhammad Anshari, Universiti Brunnei Darussalam
Mohammad Nabil Almunawar, Universiti Brunnei Darussalam
Mustafa Z. Younis, Jackson State University
Adnan Kisa, Kristiania University College

Leveraging Electronic Health Records for Public Health Improvement

Priyanka Tetali, University of Scranton
Steven Szydlowski University of Scranton

(Thursday)
Business and Health Administration
10:45 a.m.–12:00 p.m. BHAA ROOM NUMBER 1 (Dearborn 1, 7th Floor)

Theme: Hospital Management and Market Structure
Chair: Mickey Skiba, Monmouth University
Discussant: Michael M. Costello, University of Scranton

The Promises and Perils of Hospital Mergers

Mickey Skiba, Monmouth University
Jonathan Daigle, Monmouth University

Concentration in the Chicago Hospital Market

Anthony Paul Andrews, Governors State University

The Impact of Rural Hospital Closures and Clinical Staff Shortages on Access to Quality Health Care in Rural America: Issues and Strategies for Improvement

Solomon J. Yniguez, University of Houston – Clear Lake
Ashish Chandra, University of Houston – Clear Lake

(Thursday)
Business and Health Administration
10:45 a.m.–12:00 p.m. BHAA ROOM NUMBER 2 (Dearborn 2, 7th Floor)

Theme: Public Health
Chair: Michael F. Peters, Baker College
Discussant: Deborah Gritzmacher, Clayton State University

A Prescription for Promoting Improved Nutrition in Michigan

Michael F. Peters, Baker College

Barriers to Post-Acute Care Dental Services

Manwa Hegde, University of Scranton
Daniel J. West, Jr., University of Scranton

Prevalence of Overweight/Obesity, Anemia, and Their Associations among Female University Students in Dubai, UAE: A Cross-Sectional Study

Haleama Al Sabbah, Zayed University
Mustafa Z. Younis, Jackson State University
Jai Parkash, Keiser University
Adnan Kisa, Kristiania University College

(Thursday)
Business and Health Administration
10:45 a.m.–12:00 p.m. BHAA ROOM NUMBER 3 (Dearborn 3, 7th Floor)

Theme: Health and Wellness
Chair: Kelly Haugen, North Dakota State University
Discussant: Steven Szydlowski, University of Scranton

Health & Wellness Club Self-Care

Rodeen Lechleitner

Impact of Cost in Delay/Deferral of Care: A Systematic Literature Review

Crissy Flake, Northcentral University
Robert Clegg, Northcentral University

Social Determinants of Health

Maitri Shah, University of Scranton
John Wiercinski, University of Scranton

(Thursday)
Business and Health Administration
12:15–1:30 p.m. BHAA ROOM NUMBER 1 (Dearborn 1, 7th Floor)
BHAA Luncheon (Ticket Required)

(Thursday)
Business and Health Administration
1:30–2:45 p.m. BHAA ROOM NUMBER 1 (Dearborn 1, 7th Floor)

Theme: Public Health Crises
Chair: Robert Spinelli, University of Scranton
Discussant: William K. Willis, Marshall University

Supply Chain Management Issues and Challenges for Healthcare Products and Services During and After Natural Disasters

Carlos Galindo, University of Houston – Clear Lake
Ashish Chandra, University of Houston – Clear Lake

Safe Injection Sites Economic Impact

Steven Havrilla, University of Scranton
Katherine Loughlin, University of Scranton
Lea Scopelliti, University of Scranton

How Leadership Collaboration Can Best Address the Homeless Crisis

Sarah Novak, University of Scranton
Hillary Grove, University of Scranton
Robert Spinelli, University of Scranton

(Thursday)
Business and Health Administration
1:30–2:45 p.m. BHAA ROOM NUMBER 2 (Dearborn 2, 7th Floor)

Theme: Joint Session with Business Economics - Public Health and Decision-Making
Chair: Libusa Radkova, St. Elisabeth University of Health and Social Work
Discussant: Dan Friesner, North Dakota State University

The Integration of Children with Down Syndrome in Mainstream Schools: Parents' Experiences, Needs and Expectations in Slovakia

Libusa Radkova, St. Elisabeth University of Health and Social Work
Lucia Ludvigh Cintulova, St. Elisabeth University of Health and Social Work
Betty Toth, St. Elisabeth University of Health and Social Work

Analysis of Factors Determining Maternal Attitudes Towards Childhood Vaccination

Lucia Ludvigh Cintulova, St. Elisabeth University of Health and Social Work
Libusa Radkova, St. Elisabeth University of Health and Social Work

Vaccination versus Anti-Vaccination: Examination of Significant Controversy over Vaccinations of Newborns in the United States

Luciano Albanese, University of Evansville
Hannah Gourley, University of Evansville
Emma Boebinger, University of Evansville
Jami Nobbe, University of Evansville
Kanza Shamim, University of Evansville

(Thursday)
Business and Health Administration
1:30–2:45 p.m. BHAA ROOM NUMBER 3 (Dearborn 3, 7th Floor)

Theme: Healthcare Management
Chair: Hanadi Hamadi, University of North Florida
Discussant: Kelly Haugen, North Dakota State University

Hospital and Community Characteristics Associated with Baby Friendly Status in U.S. Hospitals

Aurora Tafili, University of North Florida
Hanadi Hamadi, University of North Florida
Aaron Spaulding, Mayo Clinic Jacksonville

How to Design Hospital Settings for Visually Impaired Patients

Hengameh Hosseini, University of Scranton

The Impact of Provider Websites on Patient Decision-Making

Rita A. DiLeo, University of Scranton
Michaelangelo Messina, University of Scranton
William F. Miller, University of Scranton
Marissa Lembo, University of Scranton

(Thursday)
Business and Health Administration
3:00–4:15 p.m. BHAA ROOM NUMBER 1 (Dearborn 1, 7th Floor)

Theme: Panel Discussion: How to Get Published
Chair: Ashish Chandra, University of Houston-Clear Lake

Meet the Editors of *Hospital Topics*:
Ashish Chandra, *Editor-in-Chief*
Hanadi Hamadi, *Consulting Editor*
Adnan Kisa, *Consulting Editor*
David Wyant, *Consulting Editor*
Dan Friesner, *Consulting Editor*

(Thursday)
Business and Health Administration
3:00–4:15 p.m. BHAA ROOM NUMBER 1 (Dearborn 2, 7th Floor)

Theme: Panel Discussion: Health Administration – Students' Perceptions, Concerns, Expectations and Outcomes
Chair: Aurora Tafili, University of North Florida

Panelists
Crissy Flake, Northcentral University
Carlos Galindo, University of Houston – Clear Lake
Priyanka Tetali, University of Scranton
Solomon J. Yniguez, University of Houston – Clear Lake

(Thursday)
Business and Health Administration
3:00–4:15 p.m. BHAA ROOM NUMBER 1 (Dearborn 3, 7th Floor)

Theme: Joint Panel Discussion with Business Economics: Examining Organizational Changes at Universities in Response to Enrollment and Other Challenges
Chair: Scott Wallace, University of Wisconsin Stevens Point

Panelists
Scott Wallace, University of Wisconsin - Stevens Point
Trevor Knox, Muhlenberg College
Jason Davis, University of Wisconsin – Stevens Point
Tim Schibik, University of Southern Indiana
William Stroube, University of Evansville

(Friday)
Business and Health Administration
9:15–10:30 a.m. BHAA ROOM NUMBER 1 (Dearborn 1, 7th Floor)

Theme: The Evolution of Health Administration: What Will the Profession and Its Degree Programs Look Like 30 Years from Now?
Chair: Deborah Gritzmacher, Clayton State University

Panelists
Joey Helton, Clayton State University
Vivek Natarajan, Lamar University
Gene Wunder, Washburn University

(Friday)
Business and Health Administration
9:15–10:30 a.m. BHAA ROOM NUMBER 3 (Dearborn 2, 7th Floor)

Theme: Health Care Management
Chair: Ateequr Rahman, Rosilind Franklin University
Discussant: Kelly Haugen, North Dakota State University

Trends and Economics of Migration of Surgery from Inpatient to Outpatient Settings

Faisal M. Rahman, St. Xavier University

Combating the Dual Challenges of Healthcare Access and Affordability in Third World Settings – A Roadmap for Bangladesh

Faisal M. Rahman, St. Xavier University

Reasons for Rapidly Increasing Drug Prices

Gene Wunder, Washburn University
Judy Wunder, Wunder Consulting Group

(Friday)
Business and Health Administration
9:15–10:30 a.m. BHAA ROOM NUMBER 3 (Dearborn 3, 7th Floor)

Theme: Public Health
Chair: William B. Stroube, University of Evansville
Discussant: Joey Helton, Clayton State University

In the Defense of Public Health… and their Privacy: Shaping Health Policy in the Framework of Cybersecurity

Monroe J. Molesky, Alma College

Reduction of Physical and Chemical Restraints in Healthcare

Alexandra N. Latoria University of Evansville
William B. Stroube, University of Evansville

A Public Health Approach: The Effect of Post-Traumatic Stress Disorder on Adolescents

Blake Johnson, University of Evansville
Nicolette Wickes, University of Evansville
Janson Garman, University of Evansville
Shiva Rodrigues, University of Evansville
Mariam Alhajji, University of Evansville

Medical and Diagnosis Disclosure Decisions Made by Women with Positive BRCA Results

Sydney Bachman, University of Evansville
Su Jin Jeong, University of Evansville

(Friday)
Business and Health Administration
10:45–12:00 p.m. AIB ROOM NUMBER 3 (Crystal Room 3rd Floor)

Theme: Joint Session with International Business
Chair: Joseph D. Trendowski, Valparaiso University
Discussant: Dan Friesner, North Dakota State University

How the U.S. Health Services Industry is (Finally) Globalizing

Blair Gifford, University of Colorado Denver

Lessons for Long Term Care Administrators in India

Gunjan Bansal, University of Scranton

The Impact of the System of Financing Health Insurance on Employment Opportunities for Low Income Workers: An International Comparison

David K. Wyant, Belmont University

Global Health Governance, Trade Governance and the Regime of the Framework Convention on Tobacco Control

Amit Mukherjee, Stockton University
Naz Onel, Stockton University

TRACK

HEALTHCARE PROFESSIONALS CLINICIANS

ASSESSMENT OF NORWEGIAN PHYSICIANS' KNOWLEDGE, EXPERIENCE AND ATTITUDES TOWARDS MEDICAL CANNABIS

John Laurence Arnfinsen, University of Oslo
Adnan Kisa, Kristiania University College

ABSTRACT

The purpose of this cross-sectional study is to assess the knowledge, first time, experiences and attitudes of physicians' in Norway towards medical cannabis (MC). The physicians generally agreed that MC is a legitimate treatment option, and a therapeutic agent for treating cancer and chemotherapy induced side effects as well as have the potential to reduce unnecessary opioid use in patients with chronic pain. Statistically significant differences were found between subgroups in the sample in terms of years of practice, gender, specialty, age, place of obtaining medical diploma and practice type.

INTRODUCTION

Medical cannabis (MC) is a treatment option that has become a hot topic of debate within academia, medicine and policymakers in Norway (Kristensen and Mlodozeniec, 2017; Pisanti, 2016). Controversies relating to its legal status, ethical- and societal implications associated with its consumption, ill effects on health attributed to cannabis intoxication as well as a myriad of calls for its therapeutic properties partially represents some of the complexities surrounding MC. The drug, once frequently utilized by physicians' for an array of medical conditions, has undertaken a course as a commodity widely used across the globe for a wide range of purposes (e.g., rope, fibre, food and medicine), to being subject to prohibitionist international laws in which spurred governments all over the world to criminalize cannabis (Pertwee, 2014). Despite widespread prohibition, numerous patient groups have reported using cannabis for analgesia and psychological relief (Clarke et al., 2004). To date, 29 states in the U.S have introduced cannabis for medicinal purposes with several states expecting to follow (EMCDDA, 2016). Moreover, more than 20 countries in Europe and several countries in Latin America have granted regulatory approval for cannabis-based formulations for medicinal purposes.

The debate surrounding MC contains polarizing views and centers around the notion that cannabis possesses significant therapeutic properties, the notion that cannabis is addictive and associated with physical- and cognitive impairment as well as concerns related to spill over effects (i.e., increased recreational use) if made available to patients (Sznitman and Bretteville-Jensen, 2015). Reports indicating the potential therapeutic effects and values of cannabis constitute a formidable body of literature (Joey et al., 1999; Abrams et al., 2007; Wilsey et al., 2008; Elis et al., 2009; Bushlin and Rozenfeld, 2010; Ware et al., 2010; Whiting et al., 2015; Abrams et al., 2007; Blake et al., 2006; Robson, 2013). Likewise, there are plentiful of concerns posed towards the potential addictive nature of cannabis (Schlossarek et al., 2016; Hall, 2015; Budney et al., 2004), yet such evidence remains weak and suggests cannabis to hold lower probability of dependence compared with traditional opioid medications (ICSDP, 2015). Moreover, some scientific research point towards that the legalization of MC has had no significant impact on public health and safety, consumption or related adverse effects (Nussbaum et al., 2011; Hall and Weier, 2015; Sznitman and Zolotov, 2015; Ziemianski et al., 2015). Moreover, the legal introduction of MC has reported to increase safety and awareness of patients, as users are no longer breaking the law (Troutt and DiDonato, 2015). Such findings partially provide the basis for the ongoing shift in attitudes towards re-introducing MC by governments worldwide. In 2016 the Norwegian Medicines Agency in conjunction with the Norwegian Directorate of Health formalised new guidelines in which enables specialists to apply for permission to prescribe cannabis to patients. This application process is strictly regulated and there is only one reported incident by which a patient has been granted approval to receive cannabis as medical treatment in Norway ((Rubens, 2014; Statens Legemiddelverk, 2018). Furthermore, this particular study was conducted on foot of regulatory developments and debates in Norway whereby the parliament passed a majority vote

towards decriminalizing drugs (Stortinget, 2017). It is fair to assume that the unravelling of prohibitionist drug laws represents a key milestone for proponents of MC being re-introduced into the armamentarium of physicians' in Norway. Consequently, a calmer, more balanced assessment of the key components surrounding MC is needed in order to guide policy debates. The main aim of this study is to determine the knowledge, experiences and attitudes of physicians' in Norway towards MC, and hence, contribute towards filling the current void in the literature on the perspectives of physicians' towards MC in healthcare systems where MC is not readily available as a treatment option. Moreover, no such studies have ever been conducted in Scandinavia, let alone in Norway. The main research questions are: 1) Do physicians' in Norway view cannabis as a legitimate treatment option, and, for what medical conditions may cannabis hold therapeutic value ?, 2) What is the position of physicians' in Norway towards introducing MC by prescription in Norway, and, what are the justifications for their stance?

METHODOLOGY

Sample

This study was carried out at Oslo University Hospital (OUS). OUS is a publicly owned university hospital and serves as a local and acute hospital for the majority of Oslo's population. This study was approved by the Norwegian Centre for Research (NSD) prior to the distribution of the survey instrument. The sample included all specialties and practice types (i.e., physicians' undergoing specialist training and foundation physicians'). The electronic survey was distributed to 20 department leaders at OUS in which forwarded the questionnaire to 334 physicians. Of these 114 responded (34.1% response rate). Twelve physicians did not provide enough answers for the analysis, and were therefore excluded from the subsequent analysis.

Data collection

A self-administered close-ended questionnaire consisting of four parts was used in the study. The design of the electronic survey instrument used for this study was based on previous research studies (Ablin et al., 2016; Ebert et al., 2015; Michalec et al., 2015; Ziemianski et al., 2015) and modified in order to correlate with the Norwegian healthcare system and the legislation surrounding MC in Norway. The survey was distributed over 4 weeks in February and March 2018. The electronic survey contained 4 sections and had 31 items. All questions in the survey were close-ended questions with multiple-choice styled questions, and Likert-scale alternatives ranged from: strongly disagree/disagree to neither agree nor disagree to agree/strongly agree. The first section concentrated on knowledge of MC and contained 10 close-ended questions. The second section entailed questions on the experience of physicians' with MC in a clinical setting. In order to capture physicians' attitudes towards MC the third section entailed 11 close-ended questions on various "hot-topics" on MC. The fourth section contained demographical data such as: age, gender, marital status, place of obtaining medical diploma, specialty and number of years in practice.

The survey instrument was reviewed for construct validity by 5 physicians working at a local hospital in Oslo in order to make any necessary adjustments to the both the instrument and its instructions. In accordance to their comments, minor changes were made to the original survey instrument, mostly in relation to medical terminology, but also some in regards to the overall functionality of the instrument.

Statistical analysis

Responses obtained from the electronic survey was exported from www.Surveymonkey.com into Excel (version 16) and subsequently exported into Statistical Package for the Social Sciences (SPSS) (version 25). All variables were analyzed using frequencies, means, proportions, standard deviations, and percentages. A variety of statistical analyses were applied to the data, including Chi-square , independent t-test, and one-way ANOVA. Characteristics of physicians and groups of physicians were described while inferential statistics were utilized to test the research questions on comparing groups. Statistical significance was defined with a p-value of .05 through all the statistical analyses conducted in the current study.

RESULTS

Demographics

Males (n = 43) constituted 42.5% of the sample whereas (n = 58, 57.4%) were female. The mean age of the participants' was 44.8 (SD± 9.12). Over half of the sample (n = 63, 62%) were 44 years or younger whereas (n = 38, 37.6%) were 45 years or older. Mean years of practice were 15.7 (SD± 10.11). A slight majority of the sample (n = 58, 58 %) had a maximum of 16 years in practice while (n = 42, 42%) had 17 or more years in practice. Of the participating respondents (n = 65, 65%) were specialists whereas (n = 35, 35%) were physicians' currently undergoing specialist training.

Knowledge

The majority (n = 70, 70.2%) of physicians ranked their current level of knowledge on MC as a treatment option as either "no knowledge" (n = 23, 23.7%) or "little knowledge" (n = 47, 46.5%) (see Table 1). There were no significant differences between male- ($\bar{X}$ = 2.14, SD± 0.8) and female physicians' ($\bar{X}$ = 2.11, SD± 0.9) in terms of how they ranked their own knowledge on MC ($p > 0.05$). Moreover, there were no statistical difference between specialists ($\bar{X}$ = 2.17, SD± 0.92) and doctors currently undergoing specialist training in how they ranked their own level of knowledge on MC ($\bar{X}$ = 2, SD± 0.84) ($p > 0.05$). Furthermore, there were no statistical differences between physicians' aged ≤ 44 ($\bar{X}$ = 2.1, SD± 0.84) compared with ≥45 ($\bar{X}$ = 2, SD± 0.9) nor any statistical difference in terms of the number of years in practice as the difference between physicians' with ≤16 practice years ($\bar{X}$ = 2.2, SD± 0.9) and ≥17 years in practice ($\bar{X}$ = 1,9, SD± 0.78) on knowledge on MC as a treatment option as the analysis did not yield statistical significant values ($p > 0.05$). However, physicians' who obtained their medical diploma abroad (n = 22, 22.2%) registered having greater knowledge on MC ($\bar{X}$ = 2.2, SD± 1) compared with physicians' trained in Norway (n = 77, 77.7%) ($p < 0.05$).

Table 1: Assessment of own knowledge on medical cannabis as indicated by physicians

	No knowledge		Little knowledge		General knowledge		Knowledgeable		Very Knowledgeable			
	n	%	n	%	n	%	n	%	n	%	Mean	SD +/-
At the current time, how would you rate your knowledge on medical cannabis?	23	23.7	47	46.5	26	25.7	2	1.9	2	1.9	2.1	0.8

The respondents did, however, report to be more familiar with the adverse effects of cannabis ($\bar{X}$ = 3.1, SD± 0.9) (see Table 2). For the following item "to what extent are you familiar with the ECS?" no statistical differences were found on knowledge scores between: physicians' obtaining their medical diploma in Norway ($\bar{X}$ = 1.8 , SD± 0.89) and overseas ($\bar{X}$ = 2, SD± 1.1), male ($\bar{X}$ = 1.95, SD± 0.96) and female physicians' ($\bar{X}$ = 1.86, SD± 0.95), physicians' aged ≤44 ($\bar{X}$ = 1.9, SD± 1.0) and ≥45 ($\bar{X}$ = 1.89, SD± 0.8), years in practice ≤ 16 ($\bar{X}$ = 1.92, SD± 1) and

≥ 17 ($\bar{X}$ = 1.86, SD± 0.78) as (p > 0.05). This notwithstanding, physicians' undergoing specialist training ($\bar{X}$ = 2.12, SD = ±1.14) reported being more familiar than specialists ($\bar{X}$ = 1.78, SD± 0.82) on the ECS (p < 0.05).

In regards to the following item: "to what extent are you familiar with the legislation on MC in Norway?" no statistical differences were found in levels of familiarity between: physicians' acquiring their medical diploma in Norway ($\bar{X}$ = 1.86, SD± 0.92) compared with obtaining an overseas diploma ($\bar{X}$ = 2, SD± 1.11), male- ($\bar{X}$= 1.93, SD± 1) and female physicians' ($\bar{X}$ = 1.88, SD± 0.94), physicians' aged ≤44 (1.94, SD± 0.99) and aged ≥45 ($\bar{X}$ = 1.87, SD± 0.94), years in practice ≤16 ($\bar{X}$ = 1.93, SD± 1.02) and ≥17 ($\bar{X}$ = 1.87, SD± 0.89) and specialists ($\bar{X}$ = 2.06, SD± 1.05) compared with physicians' currently undergoing specialist training ($\bar{X}$= 1.18, SD± 0.91) (p > 0.05).

When provided with the following item: "To what extent are you familiar with the process of prescribing MC in Norway?" there were no statistical difference in scores between: physicians' obtaining a diploma in Norway ($\bar{X}$ = 1.63, SD± 0.77) and abroad ($\bar{X}$ = 1.59, SD± 0.95), male- ($\bar{X}$ = 1.67, SD± 0.96) and female physicians' ($\bar{X}$ = 1.57, SD± 0.75), physicians' aged ≤44 ($\bar{X}$ = 1.62, SD± 0.79) and aged ≥45 ($\bar{X}$ = 1.61, SD± 0.75), and practice experience (years) ≤16 ($\bar{X}$ = 1.62, SD± 0.79) and ≥17 ($\bar{X}$ = 1.62, SD± 0.75) and specialists ($\bar{X}$ = 1.63, SD± 0.86) and physicians' in specialist training ($\bar{X}$ = 1.62, SD± 0.74) as (p > 0.05).

Table 2: Knowledge on central cannabis-related topics

	Very little extent		Little extent		Neutral		Great extent		Very great extent		Mean	SD +/-
	n	%	*n*	%	*n*	%	*n*	%	*n*	%		
To what extent are you familiar with the endocannabinoid system?	43	43.0	32	32.0	19	19	5	5	1	1	1.8	0.9
To what extent are you familiar with the legislation on medical cannabis in Norway	43	42.5	33	32.6	18	17.8	6	5.9	1	0.9	1.9	0.9
To what extent are you familiar with the process of prescribing medical cannabis in Norway?	53	51.9	38	37.2	9	8.8	1	0.9	1	0.9	1.6	0.7
To what extent are you familiar with the dosage of medical cannabis?	64	62.7	23	23.4	8	7.8	2	1.9	1	0.9	1.5	0.8

To what extent are you familiar with the adverse effects of cannabis?	4	3.9	24	23.5	37	36.2	33	32.3	4	3.9	3.1	0.9

When asked the following question: "To what extent are you familiar with the dosage of MC?" there were no statistical difference in knowledge scores between physicians' with a medical diploma from Norway ($\bar{X}$ = 1.5, SD± 0.73) and abroad ($\bar{X}$ = 1.59, SD± 1.05), physicians' aged ≤44 ($\bar{X}$ = 1.59, SD± 0.87) and aged ≥45 ($\bar{X}$ = 1.39, SD± 0.67), and practice years ≤16 ($\bar{X}$ = 1.56, SD± 0,84) and ≥17 ($\bar{X}$ = 1.46, SD = ±0.75) and specialists ($\bar{X}$ = 1.54, SD± 0.88) compared with physicians' currently undergoing specialist training ($\bar{X}$ = 1.51, SD± 0.77) as ($p > 0.05$). Despite overall low scores, male physicians' ($\bar{X}$ = 1.7, SD± 0.96) reported being more familiar with dosing MC compared with female physicians' ($\bar{X}$ =1.38, SD± 0.64). This finding reached statistical significance ($p < 0.05$).

Regarding the following item: "to what extent are you familiar with the adverse effects of cannabis?" there was no statistical difference in mean scores between: physicians' obtaining their medical diploma in Norway ($\bar{X}$ = 3.10, SD± 0.90) and overseas ($\bar{X}$ = 3.09, SD ± 1.06), male- ($\bar{X}$= 3.02, SD± 1.03) and female physicians' ($\bar{X}$ = 3.16, SD± 0.85) physicians' aged ≤44 ($\bar{X}$ = 3.29, SD± 0.90) compared with aged ≥45 ($\bar{X}$ = 2.79, SD± 0.90) and practice years ≤16 ($\bar{X}$= 3.30, SD± 0.93) compared with ≥17 ($\bar{X}$ = 2.79, SD± 0.86) as ($p > 0.05$). However, doctors currently undergoing specialist training ($\bar{X}$ = 3.41, SD± 0.85) indicated to be more familiar with the adverse effects of cannabis than specialists ($\bar{X}$ = 2.93, SD± 0.94) ($p < 0.05$).

Physicians were asked to cite their source(s) of obtaining their knowledge on MC. The most frequently cited source of information by which respondents obtained their knowledge on MC were news and television (n = 70, 39.5%), followed by medical literature (n= 48, 27.1%), healthcare providers (n = 30, 16.9%), lectures and seminars (n = 13, 7.3%), and friends and family (n= 12, 7.3%). Three physicians' indicated other sources of information such as patients, documentaries and travelling.

The most prominently indicated adverse effects of cannabis consumption by the sample were psychosis (n = 73, 14.1%), hallucinations (n = 67, 12.9%), addiction (n = 66, 12.7%), anxiety (n = 59, 11.4%), dizziness (n = 55 , 10.6%), depression (n = 53, 10.2%), impaired memory (n = 52, 10.0%), dry mouth (n = 41 , 7.9 %), respiratory diseases (n = 32, 6.1%), and cancer (n = 15 , 2.9%). Four physicians' (0.7%) provided additional categories such as: concentration problems (n = 1), listlessness (n = 1), impair coordination (n = 1), and abdominal pain (n = 1).

The vast majority of respondents listed cannabis to hold therapeutic value towards cancer and chemotherapy induced side effects (n = 88, 88%). It is followed by multiple sclerosis (n = 64, 64%), side effects of HIV/AIDS (n = 43, 43%), rheumatic disease (arthritis, ulcerative colitis) (n = 42, % 12.2), Parkinson's (n = 19, 5.6%), glaucoma (n = 16 , 4.7%), anorexia (n = 14, 4.1%), epilepsy (n = 11, 3.2%), eating disorders (n = 11 , 3.2%), depression (n = 7, 2%), and cannabis has no therapeutic effects (n = 2, 0.5%). In addition, five physicians (1.4%) indicated additional categories such as: spasticity (n = 1), chronic pain (n = 3) and post-traumatic stress disorder (n = 1).

Experience

The experience of physicians' on MC is displayed in Table 3 and 4. Psychiatrists (n = 9, 33%) and specialists in internal medicine (n = 6, 23%) constituted the majority of respondents by which indicated "yes" to the following item "have you ever treated patients for the adverse effects of cannabis?". The remaining specialties featured were addiction medicine (n = 3, 11%), pharmacologists (n = 2, 7.4%), infectiologist (n = 1, 3.7%), cardiologists (n = 1, 3.7%), geriatricians (n = 2, 7.4%), breast- and endocrine surgeons (n = 1, 3.4%) and internists (n = 1, 3.7%) (see Table 3).

Moreover, addiction specialists (n = 1), geriatricians (n = 1) and gastroenterologists (n = 1) constituted the respondents indicating "yes" for the following question "have you every informally recommended cannabis to patients". The physicians' indicating "yes" in regards to "have patients or next of kin ever consulted with you about MC?" had the following specialties: pediatrics (n = 1), breast- and endocrine surgeon (n = 1), obstetrics and gynecologist (n = 1), gastroenterologists (n = 1), geriatricians (n = 1), cardiologists (n = 1), dermatologists (n = 2), internists (n = 1), infectiologists (n = 1), neurologists (n = 2), oncologists (n = 3), psychiatrists (n = 4) and addiction specialists (n = 3). Of these, the vast majority (n = 20) had been approached by 10 or less patients or next of kin (see Table 4).

Attitudes

Responses to the statement "cannabis is a legitimate treatment option" yielded no statistical differences in terms agreement levels between: physicians obtaining their medical diploma in Norway ($\bar{X}$= 3.22, SD ± 1.43) and overseas ($\bar{X}$ = 3.14, SD± 1.28), male- ($\bar{X}$ = 3.44, SD± 1.33) and female physicians ($\bar{X}$ = 3.02, SD ± 1.42), physicians aged ≤44 ($\bar{X}$ = 3.21, SD± 1.42) and aged ≥45 ($\bar{X}$ = 3.18, SD± 1.35) and physicians' with ≤16 years of practice ($\bar{X}$ = 3.43, SD± 1.37) compared with ≥17 years of experience ($\bar{X}$ = 2.82, SD± 1.37) as ($p > 0.05$). However, specialists ($\bar{X}$ = 3.26, SD ± 1.19) agreed more to the notion that cannabis is a legitimate treatment option than doctors undergoing specialist training ($\bar{X}$ = 2.58, SD± 1.28) ($p < 0.05$) (see Table 5).

Table 3: Experience with medical cannabis in a clinical setting

	Yes		No		Don't know	
	n	%	n	%	n	%
Have you ever treated patients for the adverse effects of cannabis?	27	26.4	69	67.6	6	5.8
Have you ever informally recommended cannabis to patients?	4	3.9	97	95.1	1	0.9
Have patients or next kind ever consulted with you about medical cannabis?	23	22.5	78	76.4	1	0.9

In regards to the statement "Physicians' in Norway should receive more education on MC" there were found no statistical difference in mean agreement levels between: physicians' obtaining their medical diploma in Norway ($\bar{X}$ = 3.90, SD± 1.05) and abroad ($\bar{X}$ = 3.86, SD± 1.32), male- ($\bar{X}$ = 3.86, SD± 1.18) and female physicians' ($\bar{X}$ = 3.91, SD± 1.04), physicians' aged ≤44 ($\bar{X}$ = 3.87, SD = ±1.18) and aged ≥45 ($\bar{X}$ = 3.92, SD± 0.96), physicians' with ≤16 years of experience ($\bar{X}$ =3.95, SD± 1.13) and ≥17 years of experience ($\bar{X}$ = 3.79, SD± 1.08) and between specialists ($\bar{X}$ = 3.8, SD± 1.32) and physicians' in specialist training ($\bar{X}$ = 3.94, SD± 0.98) as ($p > 0.05$).

Table 4: the number of patients / next of kin who have approached respondents about medical cannabis

	Less than 10 patients		Between 10 and 50		Between 50 and 100		More than 100		Don't know	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%

How many patients / next of kin have consulted with you about medical cannabis?	20	86.9	2	8.7	0	0	1	4.3	0	0

When indicating agreement levels on the following statement "MC may reduce the unnecessary use of opioids in patients with chronic pain" no statistical differences were found in mean scores between: physicians' obtaining their medical diploma in Norway ($\bar{X}$ = 3.14, SD ± 0.99) and overseas ($\bar{X}$ = 3.86, SD± 0.99), male- ($\bar{X}$ = 3.47, SD± 1.03) and female physicians' ($\bar{X}$ = 3.19, SD± 0.96), physicians' aged ≤44 ($\bar{X}$ = 3.25, SD± 1.04) compared with physicians' aged ≥45 ($\bar{X}$ = 3.39, SD = ±0.96) and the number of practice years ≤16 ($\bar{X}$= 3.33, SD± 1.02) compared with ≥17 years of experience ($\bar{X}$ = 3.26, SD± 0.96) or between specialists ($\bar{X}$ = 3.14, SD± 1.14) and physicians' currently in specialist training ($\bar{X}$ = 3.38, SD± 0.91) as ($p > 0.05$).

Furthermore, specialists ($\bar{X}$ = 3.27, SD± 1.19) tended to agree more to the statement "cannabis should be available by prescription in Norway" than physicians' undergoing specialist training ($\bar{X}$ = 2.54, SD± 1.29). However, this finding was not statistically significant ($p > 0.05$). Moreover, no statistically significant variations in mean agreement levels towards the notion that MC should be available by prescription were found between: male- ($\bar{X}$ = 3.19, SD± 1.18) and female physicians' ($\bar{X}$ = 2.88, SD± 1.32) physicians' obtaining their diploma in Norway ($\bar{X}$ = 2.92, SD± 1.33) and overseas ($\bar{X}$ = 3.32, SD± 0.99), physicians' aged ≤44 ($\bar{X}$ = 3.02, SD± 1.27) compared with aged ≥45 ($\bar{X}$ = 3, SD± 1.26), physicians' with practice experience (years) ≤16 ($\bar{X}$= 3.16, SD± 1.28) compared with ≥17 years of experience ($\bar{X}$ = 2.76, SD± 1.24) as ($p > 0.05$).

Table 5: Agreement levels towards cannabis-related statements

	n	%	n	%	n	%	n	%	n	%	*Mean*	*SD* +/-
Cannabis is a legitimate treatment option	19	18.6	9	8.8	29	28.4	22	21.5	23	22.5	3.2	1.3
Physicians' in Norway should receive more education on medical cannabis	6	5.8	5	4.9	19	18.6	38	37.2	34	33.3	3.8	1.1
Medical cannabis may reduce unnecessary use of opioids in patients with chronic pain	7	6.8	6	5.8	49	48	28	27.4	12	11.7	3.3	0.9
Cannabis Should be available by prescription in Norway	17	16.8	12	11.8	40	39.6	15	14.8	17	16.8	3	1.2

Physicians' in Norway should have significant influence on future changes in legislation regarding medical cannabis	3	2.9	4	3.9	21	20.5	35	34.3	39	38.2	4	1

Respondents generally agreed towards the statement "physicians' in Norway should have significant influence on future changes in legislation regarding MC". There were no statistical significant variation in mean scores on this item between: physicians' obtaining their diploma in Norway ($\bar{X}$ = 3.92, SD = ±1.95) and overseas ($\bar{X}$ = 4.27, SD± 0.82), male- ($\bar{X}$ = 4.21, SD± 0.86) and female physicians' ($\bar{X}$ = 3.84, SD± 1.08), physicians' aged ≤44 ($\bar{X}$ = 4.14, SD± 0.94) compared with physicians' aged ≥45 ($\bar{X}$= 3.76, SD± 1.07), physicians' with practice years ≤16 ($\bar{X}$= 4.07, SD± 0.99) compared with ≥17 years of experience ($\bar{X}$ = 3.9, SD± 1.04), and between specialists ($\bar{X}$ =3.85, SD± 0.98) and physicians' in specialist training ($\bar{X}$ = 4.29, SD± 1.01) as ($p > 0.05$).

The main justifications for not making cannabis available by prescription in Norway as indicated by physicians' is: risk of increased drug abuse (n = 19, 33.3%), the adverse effects of cannabis (n = 19, 33.3%), the lack of information about cannabis as a treatment option (n = 13, 22.8%), Cannabis has no therapeutic effects (n = 1, 1.7%), and Cannabis bears to much stigma (n = 1, 1.7%).

The physicians were asked the justifications for why cannabis should be available by prescription in Norway. The vast majority of physicians' that hold the stance that MC should be available by prescription cite that "cannabis may improve the quality of life for patients with chronic pain" (n = 19, 28.7), followed by "the current legislation inhibits patients from optimal quality of care" (n = 17, 25.7%), "cannabis hold a wide range of therapeutic effects" (n = 16, 24.2%), "Cannabis may reduce unnecessary use of opioids (n = 13, 19.6%). Onephysician provided an additional category whereby indicating that "the current prohibitionist legislation is based on emotions rather than evidence".

The most prominent barriers for making MC more accessible to patients were: "risk of increased drug abuse" (n = 50, 17.7%), "political resistance" (n = 51, 18.1%), "lack of clinical studies on the therapeutic effects of cannabis" (n = 48, 17.0%), "adverse effects of cannabis" (n = 44, 15.6%), "stigmatisation of cannabis users" (n =27, 9.6%), "lack of information on dosing MC" (n = 27, 9.6%), "uncertainty on the interaction with other drugs" (n =27, 9.6%), "financial expenses for patients" (n = 3, 1.0%). Four physicians' supplemented with the following additional barriers: "to little knowledge altogether on cannabis", "risk of prescribing cannabis for incorrect indications" and "risk of dealing".

When the physicians were asked their attitudes towards prescribing MC, 37% of males (n = 16) indicated "yes" whereas 18% (n = 8) indicated "no" in regards to whether they would prescribe MC if they were eligible to do so. For females 22% (n =13) indicated "yes" and 32% (n = 19) indicated "no" to the same item. The remaining 44.1% of males (n = 19) and 44.8% of females (n = 26) expressed "don't know" in relation to whether they would prescribe MC. Of those with an opinion 38.2% (n = 13) of physicians' who obtained their medical diploma in Norway indicated "yes" whereas 61.7% (n = 21) indicated "no". However, of those with an opinion and with a medical diploma from overseas 69.2% (n = 9) indicated "yes" compared to 30.7% (n = 4) stating "no". Moreover, there were no statistical difference between: male- and female physicians' ($p > 0.05$), physicians' obtaining their medical diplomas in Norway and overseas ($p > 0.05$), age ($p > 0.05$), years in practice ($p > 0.05$) and practice type ($p > 0.05$) among the responding participants in which stated they would prescribe MC if they were legally entitled to do so.

Furthermore, there were found statistical significant variation in means of the participating physicians' who stated they would prescribe MC if they had the opportunity to do so on other items in the survey. Physicians' willing to prescribing MC reported to agree more to the statement "MC is a legitimate treatment option" ($\bar{X} = 4.45$, SD± 0.91; $p < 0.05$). Moreover, the respondents who stated they would prescribe MC if they were eligible to do so agreed more strongly towards the statement "physicians' in Norway should receive more education on MC". This finding was statistically significant ($\bar{X} = 4.52$, SD± 0.63, $p < 0.05$). Similarly, physicians' who would prescribe MC agreed more to the statement "the use of MC may reduce the unnecessary use of opioids in patients with chronic pain" ($\bar{X} = 4.03$, SD± 0.94). This finding was found to be statistically significant ($p < 0.05$). Moreover, the respondents in which were positive towards prescribing MC agreed more towards the statement that "MC should be available by prescription" ($\bar{X} = 4.34$, SD± 0.76). This finding was found to be statistically significant ($p < 0.05$).

DISCUSSION

Knowledge on cannabis-related topics

Based on the survey data the vast majority of the participating physicians' reported to have very little knowledge about MC as a treatment option. This finding is comparable to several previous studies (Michalec et al., 2015; Ablin et al., 2016; Fitzcharles et al., 2014; Ziemianski et al., 2015; Ebert et al., 2015; Brookes et al., 2017; Ebert et al., 2015) all of which found relatively low scores of knowledge on MC as indicated by physicians. On the other hand, other studies found physicians' to have medium-to-high levels of knowledge in regards to MC (Ebert et al., 2015; Brookes et al., 2017). Additionally, the current study revealed physicians' to have very low knowledge on the ECS. This finding is echoed in previous research studies (Ablin et al., 2016; Fitzcharles et al., 2014).

The majority of participating physicians' reported to obtain their knowledge on MC through news media, followed by medical literature and other healthcare providers. These findings align with those found in the literature (Michalec et al., 2015; Carlini et al., 2017; Ebert et al., 2015; Kondrad and Reid, 2013; Brookes et al., 2017; Ananth et al., 2017; Carlini et al., 2017; Ziemianski et al., 2015; Ebert et al., 2015; Evanoff et al., 2 015).

The results from the current study showed that the vast majority of participating physicians' expressed being unfamiliar with the legislation surrounding MC in Norway and dosing MC. Moreover, physicians were unanimously unfamiliar with the process of prescribing MC in Norway, which is underscored by only a small number of physicians' indicating that MC could be available for patients in Norway, thus suggesting a lack of awareness among participants in regards to the guidelines formalized by the Norwegian Medicines Agency and the Norwegian Directorate of Health on MC (Statens legemiddelverk, 2018). These findings correspond with previous research as physicians' in the U.S and Canada reported to generally have little knowledge on legislation surrounding MC within their respective healthcare systems (Ananth et al., 2017; Michalec et al., 2015; Ziemianski et al., 2015; Ablin et al., 2016; Ebert et al. 2015).

Furthermore, the results of this study indicate that physicians' in Norway are more familiar with the adverse effects of cannabis. Moreover, the vast majority of participating physicians' indicated psychosis, addiction and mental disorders (e.g., anxiety, depression) as the most prominent adverse effects associated with the consumption of cannabis. Similar findings were reported in Ireland, U.S., Canada, and Israel (Crowly, 2017; Kondrad and Reid, 2013; Kweskin, 2013; Brookes et al., 2017; Ebert et al., 2015; Doblin and Kleinmann's, 1991; Utritsky et al., 2011; Kondrad and Reid, 2013; Charuvastra et al., 2005; Adler and Colbert, 2013, Ananth et al., 2017; Carlini et al., 2017; Crowley, 2017).

Experience with cannabis in a clinical setting

A small fraction of the sample in this study reported to have ever informally recommended cannabis to patients. Furthermore, one-fifth of respondents reported to have been approached by patients or next of kin wishing to consult physicians' about MC. In Ziemianski et al. (2015) as many as 79% had reported being routinely approached

by patients in order to discuss cannabis as a viable treatment option. Moreover, 84% of Israeli physicians' had previously been approached by 25 or more patients about MC (Ebert et al., 2015).

Attitudes on cannabis-related topics

The majority of physicians' in the current study tended to agree towards the notion that MC is a legitimate treatment option. This finding is mirrored in the vast majority of previous research on provider perspectives towards MC (Doblin and Kleinman, 1991; Uritsky et al., 2011, Crowly, 2017; Adler and Colbert, 2013; Ebert et al., 2015; Carlini et al., 2017; Ablin et al., 2016, Ananth et al., 2017). However, two studies reported physicians' to neglect cannabis as a legitimate treatment option as concerns were raised towards its harm on both physical- and mental health (Kondrad and Reid, 2013; Kweskin, 2013).

According to the study results, a slight majority of participating physicians' agreed towards introducing MC by prescription in Norway as 52% of those with an opinion were in favour versus 47% who opposed such a proposition. The majority of the studies examining physicians' perspectives towards the availability of cannabis through prescription have displayed that the majority of physicians' surveyed are in favour of such a proposition (Crowley, 2017; Carlini et al., 2017; Ziemianski et al., 2015; Doblin and Kleinmann, 1991; Utritsky et al., 2011).

CONCLUSION

This study is unique in terms of providing an account of the perspectives of physicians' in Norway towards MC, and is only one of few studies available assessing physicians' views on this topical issue. Respondents in this study displayed having very little knowledge on MC as a treatment option, which is a recurring finding as physicians' display having low levels of knowledge on cannabis from previous accounts in other countries. Despite limited knowledge, the majority of participants view MC as a legitimate treatment option, something that is far from disputed by healthcare providers considering previous research. This study found acceptance towards making MC accessible through prescription in Norway, which mirror the stance of the vast majority of previous studies. Despite this, no studies have examined the justifications for why physicians' held a particular stance towards MC being available by prescription. This study contributed towards filling this void in the literature as participating physicians' with an opinion on the matter indicated that: (1) lack of information about MC as a treatment option, (2) the adverse effects of cannabis, and (3) risk of increased drug abuse as justifications for why MC should remain unavailable through prescription. On the other hand, physicians' indicated that: (1) cannabis hold a wide range therapeutic effects, (2) the current legislation inhibit patients from optimal quality of care, (3) cannabis may reduce unnecessary use of opioids, and (4) cannabis may improve the quality of life for patients with chronic pain. As expert opinions, these justifications provide vital information in relation to future debates surrounding the availability of MC through prescription.

Limitations

First, the current research study lies in its low response rate and small sample size. Second, the results of this sample cannot be generalized to the represent the entire population of physicians' in Norway. Third limitation of this study is the narrow spectrum of specialties in the sample. Despite the limitations of this research, the current study is the first of its kind in Norway and should be taken into account when new legislation and regulations are considered surrounding MC. More clinical studies are needed in order to reach conclusive evidence in regards to both the therapeutic- and adverse effects attributed to cannabis use in order to facilitate evidence-based clinical decision-making on MC as a treatment option.

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MEDICAL AND DIAGNOSIS DISCLOSURE DECISIONS MADE BY WOMEN WITH POSITIVE BRCA RESULTS

Sydney Bachman, University of Evansville
Su Jin Jeong, University of Evansville

ABSTRACT

Within the past few decades, breast cancer and ovarian cancer have been discovered to be linked to genetic deletion mutations called BRCA1 and BRCA2. The BRCA gene mutations increase a woman's chance of developing breast cancer by up to 80%. Genetic testing has become more prevalent in society with individuals opting to test for genetic disorders and mutations, including the BRCA mutations. A positive result for a BRCA mutation brings decisions regarding surgeries and surveillance, sharing the results with relatives and children, and emotional and mental stress.

This literature review included existing studies that analyzed decisions made by BRCA positive women, including that of informing loved ones about the diagnosis. Only sources published within the past decade were used as the more recent studies have the most reliable and up-to-date data for BRCA. Key terms used to gather sources were "positive BRCA disclosures" and "decision-making" as the goal was to look at the decisions of the women and how the results affected the women's lifestyles. After considering the inclusion/exclusion criteria, five in depth sources were reviewed for this literature review.

Research subjects in these studies included women of all ages. Specifically, the studies grouped women as <30 years old, 30-50 years old, and >50 years old. The majority of women that opted for preventative surgical measures like a mastectomy were over the age of 30 (91.7%). A family history of cancer was also a factor that was linked to the decision to undergo a mastectomy procedure. In addition, while the women's decisions regarding their bodies were important, the decisions for informing relatives of the positive test results were often unknown. The majority of BRCA positive mothers in one case study informed their daughters of their positive test results when the daughters were between the ages of 18 and 21 (43%). This new knowledge often added worry, stress, and misconceptions to the daughters' mindsets as well as the mothers'.

With genetic testing and modern technology, the BRCA mutations can be caught early on and decisions regarding a woman's future can be decided early. That does not make the decisions any easier, however. In addition, BRCA positive mothers have a 50% chance of passing the gene to daughters which often leads to feelings of guilt. Lastly, daughters with a BRCA positive mother often worry about watching their mother develop cancer, but few sources were found that directly discussed the emotional effects of a BRCA positive result on a mother and, specifically, the daughter. More research must be completed to find specific data regarding the effects of a mother's disclosure of a positive BRCA result on the daughter's mental health.

MCID CHANGE AS A PROTOCOL FOR EXAMINING PT EFFECTIVENESS AND GUIDING PERFORMANCE BASED REIMBURSEMENT

Robert T. Palumbo, Northwestern University Advocate Medical Group
Michael Duchaj, Northwestern University Advocate Medical Group

ABSTRACT

Theory/Body: The reimbursement of healthcare services is consistently changing and updating. Recently it has been suggested that healthcare costs should be reimbursed on performance-based measures as opposed to the fee-for-service method that currently dominates the healthcare world. The call for performance-based reimbursement has grown in popularity, with research suggesting it may be the best way to incentivize proper care and reward those who provide it. Medicare itself, is currently in the process of changing its reimbursement towards a system that considers healthcare performance. Performance based reimbursement has become especially relevant in physical therapy examination and treatment. As a result, it is vital that physical therapists develop a valid and consistent model to examine the effectiveness of clinicians and their interventions.

A common issue facing the use of performance-based reimbursement is how to define the performance of health care professionals. With the myriad of different situations, settings, and conditions faced daily in healthcare it is unlikely that one measure could effectively capture all that contributes to a patient's outcomes. However, the use of valid and reliable outcome measures may provide a consistent guideline and starting point for a performance-based reimbursement model.

Our report proposes to use changes in patient outcome measures as a way of partially defining clinical performance. The model takes advantage of a statistical measures known as minimally clinically important difference (MCID). MCIDs are a measure of change within an outcome tool that represent a significant change in patient status and leads to a change in patient management. As discussed previously, different patient populations require different performance measures. With the use of MCIDs, any patient specific outcome measure with an MCID could be used to monitor patient and physical therapy performance and has the potential to be compared with increments of change in different tools.

Our model organizes patients by different functional disorders and outcomes measures: the Oswestry Disability Index (ODI) for patients with back dysfunction, the Neck Disability Index (NDI) for patients with neck dysfunction, the Lower Extremity Functional Scale (LEFS) for patients with lower extremity dysfunction, and the Disability of Arm, Shoulder, and Hand (QuickDASH) for patients with upper extremity dysfunction. Each of these outcome measures has an amount of change that represents its MCID. The model takes that MCID change and uses it as 1 MCID unit.

This model was integrated system-wide to collect agreed upon outcome measures by every therapist for their patients. These data were collected and organized by outcome measure and therapist. Therapists' performances can then be examined by the average change in MCID units of their patients. This information, along with number of visits needed per patient, provides a quick, but detailed picture of the effectiveness of each therapist.

TRACK

ETHICAL/LEGAL ISSUES IN HEALTHCARE

FUTURE OF GENETIC ENGINEERING AND CRISPR TECHNOLOGY: ETHICAL, LEGAL AND FINANCIAL CONSIDERATIONS

Fawzaan M. Hashmi

ABSTRACT

Genetic engineering and CRISPR technology can drastically speed up the pace of genetic experimentation and could possibly eliminate many hereditary diseases from bloodlines. CRISPR was discovered only by chance in microbes; experimenters eventually managed to apply the technique to mammalian genes. However, CRISPR is still very much underdeveloped, as in many areas it lacks in precision and efficiency. For humans, the main application of CRISPR is to eliminate hereditary disease, but it has also stimulated the urge for the bête noire of creating genetically modified children, called designer babies. The idea of designer babies is controversial, as to some, the genetic modification of humans is ethically very troubling. The majority of scientists believe that there needs to be a moratorium on the generation of genetically modified babies, but there are a select few with the exact opposite view. Majority of scientists insist that we cannot stop the advancement of contemporary technology and must go full force ahead. This paper attempts to trace the emergence of CRISPR and its potential utility for addressing human disease alongside its deficiencies, added cost to the healthcare systems and the ethical problems of designer babies. Lastly, recommendations are made to expedite CRISPR related future research, streamlining regulations and utilizing the technology for the benefit of generations to come.

INTRODUCTION

Imagine a world where parents can design babies who are intelligent, good-looking, and free from any hereditary disease. These desires might be realized if the scientific advancements in genetic editing technology continue at an accelerated pace and our civilization resolves the ethical dilemma associated with the potential abuse of this technology. CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats) is a gene-editing technology that utilizes the Cas9 protein (it should be noted that since the making of this paper, a new, more efficient and precise protein called Cas12a has been discovered) ("CRISPR-Cas12a More Precise Than CRISPR-Cas9"). CRISPR works by using three main tools: A GPS for locating DNA, scissors for cutting DNA (deleting segments), and a pen for writing new DNA (inserting segments) (Wright et al. 2016). A repair template tailored to specific parts of a DNA sequence guides Cas9. CRISPR sequences are made into short RNA (ribonucleic acid) sequences in order to match the DNA sequences. After an action similar to a GPS, the DNA is found. Then, Cas9 connects to and cuts the DNA, which shuts down the gene. Researchers can test the genome's function by using modified versions of the protein Cas9 that do not run the risk of actually cutting through the DNA (Wright et al. 2016).

History

CRISPR has a rich and surprisingly long history. Researchers in Osaka, Japan, in 1987 accidentally recorded DNA clusters, and, independently, similar clusters were found in the historic port city of Alicante, Spain, in 1993 (Zimmer 2015, Lander 2016). Researchers here unearthed microbes that safeguarded themselves with an adaptive immune system that scoured the DNA sequences of comminatory viruses. Amazingly, CRISPR changed from this into a way of editing living cells in a span of just three years. The manner in which researchers formulated CRISPR reflected the swelling importance in the biology of big data. The discovery of biological processes important to CRISPR came from large and public accumulations of biological data, not conventional lab experiments (Lander 2016).

Development of CRISPR and designer babies

Genetic modification involves the rearrangement of nucleotides in order to construct new DNA; the first of these recombinant DNA molecules were synthesized in 1972 and the first genetically modified organism (GMO) was a 1973 bacterium (Jackson et al. 1972, Arnold 2009). Since then, GMOs have controversially been applied to plants and animals in order to increase their yield and/or the tolerance of products for human consumption. GMOs have faced varying levels of success and acceptance; GMO foods are stringently regulated in the European Union, for instance (Davison 2009). Genetic modifications on animals can also help in eradicating human diseases by analyzing human genes and methodically activating and disabling targeted genes. Further medical applications of genetic engineering include the genetic enhancement of proteins and drugs as well as somatic gene therapy (the use of genetic material to treat human disease). However, scientists could not effectively use CRISPR, a form of genetic modification for editing genomes (potentially inheritably) until almost twenty years after it was discovered (Lander 2016).

Scientists tried to apply the techniques of CRISPR initially used on microbes to mammals and, by extension, to humans. Scientists in the late 1980s discovered a way of editing mammalian genomes in living cells. This was a miracle for its time; however, this process was extremely inefficient because the frequency of homologous recombination, where natural genes were switched with modified variants, was low. A "meganuclease" was found to increase the frequency of homologous recombination by establishing double-stranded breaks (Lander 2016). In order to get an efficient method for editing mammalian genomes, scientists needed a no-fail method to produce a double-stranded break wherever they wanted. The first strategy was to use zinc-finger nucleases, which are binding proteins. Despite being promising, getting these zinc-finger nucleases to consistently recognize the necessary genomic loci was an arduous process. Translating CRISPR's method of cutting and editing genomic loci to mammalian cells was difficult; their genomes are a thousand times larger and reflect a more complicated chromatin structure (Lander 2016). Rudimentary microbe systems could not be serviceably applied to this au courant environment.

Increasing the number of Cas9 proteins that would enter into the nucleus was fundamental to improving CRISPR's yield in mammal cells. In 2012, researchers developed a functioning three-component system of Cas9, incorporating S. pyogenes variants (S. thermophilus Cas9 proteins concentrate in nucleoli, while S. pyogenes Cas9 proteins are more evenly spread and thereby better suited for mammalian biologies). From this moment on, genes could be modified productively with deletions, using non-homologous end-joining, and insertions, catenating sequences with guided homologous recombination. Excitingly, genes could be compiled concurrently because of spacers embedded in CRISPR arrays (Lander 2016). CRISPR could now be used to concoct complex mouse models of inherited diseases and to implement genome-wide screening.

Clinical benefits of CRISPR

More and more people are becoming familiar with CRISPR, and that number is only growing. CRISPR is a substantially more efficient way to modify the human genome than previous technologies. Due to CRISPR, genetic experiments that took years can now take only a few weeks. Many hereditary diseases such as lung cancer, liver disease, congenital blindness, sickle cell disease, and Huntington's disease can be eliminated by CRISPR (Wright et al. 2016). As an added bonus, CRISPR can permanently remove the disease from the bloodline, so these debilitating diseases would not affect those future generations.

CRISPR can also be used to help diseases like ALS and types of muscular dystrophy. These are caused by RNA build-ups and proteins being somewhere where they do not belong. CRISPR can help eradicate the damaging effects of the RNA, thus reversing the devastating effects. The goal is to nullify such diseases but CRISPR cannot target the DNA; it has to target the RNA, which is a messenger molecule. However, it is not very easy to simply cut off RNA when it is conjoined with DNA. Therefore, a different Cas9 protein must be applied to separate DNA and RNA (Mullin 2017). After the separation of DNA and RNA has been achieved, CRISPR can bind to and delete the desired RNA.

Ethical considerations

CRISPR has by now taken the scientific community by storm. However, whenever modifying the human germline is brought up, contentious international debates ensue. Many people do not support the modification of the human race. They argue that there are always unintended consequences for every change imprinted onto the human genome (Knoepfler 2017). And in fact, prior to that stage, the modification of the embryo itself fails about half the time (Mulvihill et al. 2017).

The editing of genomes for plants and animals has been around for a long time, but it can now be applied to humans. But how far we should take this technique is subject to a host of ethical conflicts. Everybody from theologians to doctors has been involved in a debate over the ethical and social consequences of human genetic modification as well as its relationship with eugenics. Germany and Denmark have banned the creation of genetically modified babies, largely due to the belief that modifying an embryo would ruin the already healthy embryo (Knoepfler 1-10). Genetically editing an already alive human may be deemed to be even scarier as we would have no idea what the consequences and repercussions might be. These debates of medical ethics cannot be addressed fully without introducing the Eugenics movement and the debate around imposing a moratorium on future CRISPR research.

A-Eugenics

The American eugenics movement of the last century concentrated on "purifying" bloodlines from the "unhealthy" and sometimes straightforwardly "undesirable" characteristics of non-white, disabled, and poor populations. Support for eugenics in American culture was widespread in the early part of the 20th century. People competed to discover who had healthier children with "Better Baby Contests," in which children were evaluated alongside vegetables (Bouche and Rivard 2014).

Twenty-eight (28) states (Indiana being the first) by 1931 passed sterilization laws so that 64,000 were forcibly sterilized on American soil. In Buck v. Bell (1927), the state of Virginia tried to sterilize Carrie Buck. Supreme Court Justice Wendell Holmes sided with Virginia, legalizing all the new sterilization laws, and wrote, "three generations of imbeciles is enough (Bouche and Rivard 2014)." The cruelty of California's forced sterilization inspired the Nazis' eugenics programs. Beginning in the 1940s and especially with the recognition of the severity of Nazi programs, eugenics fell out of favor.

It is argued that if genetically modified designer babies are permitted to all interested parents it might serve as a backdoor to modern eugenics. A designer baby is a genetically modified human embryo, usually created in an artificial womb. A designer baby can have whatever traits the parent or scientist wants, making it possible to have a "superhuman" (Knoepfler 1-10). For instance, parents could make a baby tall, smart, athletic, handsome, etc. After all, parents would conceivably want the best for their kids, which would entail wanting their kids to be at the top.

Proponents of CRISPR technology argue that the process is inefficient and would take a huge sum of money at the beginning to create a designer baby, despite saving a consequential amount on healthcare costs since in theory the child's germline could be edited to make them mostly immune to common viruses as well as serious diseases. Opponents still feel that CRISPR technology can be manipulated by the wealthy few to create a perfect human being, possibly capable of dominating billions of impoverished people. In the worst-case scenario, some would use gene editing to try to eliminate everyone in the world who is not a designer baby in order to try to create a sort of "perfect race."

B-Legal considerations and need for moratorium

Germline genomes mutate, and there are many likely associations of spontaneous genetic disease with environmental factors (Mulvihill et al. 2017). This paradox exemplifies an uncertainty regarding how germline genomes work. For many specialists, in fact, the uncertainty of outcomes justifies a moratorium on the clinical use of CRISPR. Proponents of a moratorium believe that several factors such as Federal Drug Agency (FDA) policies, civil

liability, possible criminal charges, professional sanctions, and institutional pressures already buttress such a moratorium (Knoepfler 97-8).

In 2017, the National Academy of Sciences (NAS) published a report supporting the testing of CRISPR gene editing for serious hereditary diseases such as sickle cell disease, hemophilia, cystic fibrosis, Duchenne muscular dystrophy, genetic forms of blindness, and cancer, and not for "stronger" or "smarter" designer babies (Powledge 2017). However, according to writer and researcher Paul Knoepfler, who has called for a moratorium on all germline modification period, the report assigns too much importance to the specter of parental autonomy and does not appreciate the level of testing required before embryo editing could medically be considered (Knoepfler 2017). The NAS report recommendations, like the one proposed in 2014 by a group of biologists led by Professor Jennifer Doudna, would be applied to any possible clinical usage on CRISPR-style gene editing and has allowed the current pace of testing on mammalian, including human, cells to continue (Doudna 2017).

Doudna and Sternberg (2017) struggled on the debate between a moratorium and increased research for CRISPR technology. Both of the authors are pioneers in CRISPR research in the recent past and have lately advocated for more restrictions on future research. Doudna and Sternberg (2017) have summarized their dilemma by defining CRISPR as something that "offers both the greatest promise and, arguably, the greatest peril for the future of humanity (Doudna and Sternberg 2017)." In January 2015, eighteen scientists including Professor Doudna recommended that CRISPR-related ethical issues must be thoroughly investigated and understood before any attempts at human engineering are sanctioned. These scientists suggested restrictions but fell short of arguing for complete restrictions on future research.

DISCUSSION

Recommendations and future directions

CRISPR has elevated hopes of permanently protecting humans from genetic disease. Yet, so much is unknown about the relations between CRISPR methods and environmental factors as well as between the internal variations of the genetic code. Because this technology has a potential to be utilized for a variety of harmful and problematic manipulations of human populations, governments and institutions should take the proactive approach and direct scientists to address only hereditary diseases to reduce sufferings and not just for the sake of vanity. A harrowing example of the latter is the case of He Jiankui, who made what the first CRISPR edits of humans were allegedly by irresponsibly and gratuitously deactivating the genes of a pair of twins (Yong 2018).

After careful review of the current state of the CRISPR related scientific progress and the potential to benefit the human race, this study makes the following recommendations to implement CRISPR in an influential and ethical way.

- **Investment:** A good start for universities, national governments, and global institutions is to invest more in furthering our knowledge of CRISPR. All new technologies of the last century needed public-sector support to be fully developed. The initial financial cost often outweighs potential benefits in the years to come.

- **Education:** National governments should educate citizens, the insurance industry, and patients about the cost, risks, ethical considerations and possibilities of CRISPR technology. Universal awareness of this revolutionary technology reduce fear on the part of informed citizens and help them keep an eye on the abusers. Another related solution is to educate high school and college students along with science teachers about the possibilities of this technology and its career paths. This way, the next generation of people will be able to make informed decisions in their adulthood, considering that CRISPR might be more prevalent by the time the current generation of children are adults. In addition, medical institutions, universities, and

insurance providers need to teach their concerned clients about the possibilities of CRISPR technology, especially if they end up considering it for clinical purposes.

- **Regulations:** National governments and global institutions should set ethical guidelines for research institutions and universities. Although it would be difficult to enforce these ethical guidelines outside domestic regulatory regimes, scientists across the world did remain faithful to a 1975 moratorium on the recombinant DNA technique (Wade 2015). Likewise, because the debates surrounding CRISPR deal with the fundamentals of the human genetic makeup, the entire world has a significant stake in how this technology evolves. The precedent suggests that the majority of credentialed researchers would have faith in consensus. At the same time, something more taxing, such as a multinational agreement, might need to be organized in order to reel in rogue experimenters around the world. Moreover, any ethical framework must aggressively ensure that no discriminatory beliefs influence the direction of modern technology. Using CRISPR for any racist or sexist purposes would be a backdoor to eugenics.

- **Coordination:** The true benefits of CRISPR technology can only be drawn through close coordination among geneticists, biologists, medical ethics experts, religious thinkers, economists, educationalists, and policymakers in all technologically advanced countries. Without a close working relationship, there is a serious risk of misinformation and eventual delays in enjoying the full potential of this technology. This study suggests the creation of a high-power commission in the United States and other interested countries where representatives from various disciplines can discuss controversial issues and chart out a strategic plan for the next decade. The policy recommendations and practical steps can be revised on a periodic basis to accommodate the changing technological and ethical landscape.

- **Cost & Benefit Analysis:** National governments and researchers should analyze and compare the initial investment to develop CRISPR technology and the potential savings not only in healthcare costs but also from making millions of citizens productive again. Without a detailed cost-benefit analysis, it may be difficult to secure major findings in today's competitive economic environment.

Scientific researchers, the insurance industry, medical institutions, institutions of higher education, policymakers around the world, and global institutions can use the findings and recommendations of this study for the future development of CRISPR technology and the benefit of their clients. There are obviously challenges ahead, but the possibilities outweigh any obstacles and economic costs.

CONCLUSION

Throughout human history, new technologies tended to be used for the benefit of humanity in general. Unfortunately, the same technology has also been employed for destructive purposes by iniquitous people in power. CRISPR technology is no different from other almost revolutionary technologies of the past including nuclear technology. Therefore, scientists must learn from their experiences and use CRISPR technology to improve the quality of life of millions of people by avoiding debilitating diseases. We must not see the CRISPR technology just as a vanity project to improve the physical attributes of a select few but rather as a necessity for our time.

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A CRITICAL LOOK AT ISSUES THAT CREATE PATIENT-PROVIDER COMMUNICATION BREAKDOWN - FROM THE PERSPECTIVE OF ETHICS, ENTITIES INVOLVED, AND LANGUAGE USED

Bandar Idris, University of Houston-Clear Lake
Ashish Chandra, University of Houston-Clear Lake

ABSTRACT

Communication forms a core basis of medical care delivery and interventions, something that the care providers and receivers must engage in as a standard means for best quality outcomes. Lack of patient education creates variation in description, application, and understanding of medical interventions and procedures hence a significant compromise in care delivery. This paper looks at the critical issue of patient-provider communication from an ethical perspective as well as provides recommendations of involing new personnel in the communication, such as a pathologist. Select new terminologies are also proposed as examples to improve patient-provider communication.

INTRODUCTION

As we have evolved towards a more patient-centered model in healthcare delivery, whichby the patient is now more engaged in their own healthcare and are not just doing what the doctor 'ordered' them to do, there is no doubt that have a proper and appropriate communication between the two parties is necessary for effective care. Healthcare professionals provide guidelines to patients to follow as part of their treatment and recovery program. Patients also report their progress and impacts of interventions to healthcare professionals for assessment and care continuity. However, quite often there is a significant language barrier in this type of communication where the patient will communicate in a more layman's terms, which the physicians may or may not prefer, and similarly, the patient may talk in more clinical terms which the patient may or may not understand. Therefore, it is imperative that both parties understand that a basic understanding, or lack there of, of medical terminologies can affect patient safety, health outcomes, efficacy of care, negligence, and medical errors. Medical errors and low standard care delivery caused by gaps in communication can result in the increased number of deaths, disabilities, delayed recovery, and high cost of care, thus may compromise the patient's quality of life. Healthcare professionals and facilities also face greater legal and ethical implications because of cases of negligence and poor performance may stem from poor patient-provider communication.

Efficiency in care delivery characterizes maximum involvement in decision making and adherence to treatment or therapeutic guidelines based on interaction standards between caregivers and patients (Reith, 2018). Effective communication in healthcare interactions increases patient compliance and lowers adverse outcomes linked to medical errors (Graham & Brookey, 2008). Assessing the impact of education for common medical terms used by healthcare professionals from patients' caregiver, and insurance perspective create a platform for universal, efficient and quality based medical outcomes. Inclusion of ethical, time, and pathology in creating awareness of common medical terms prompts evidence-based practice across all levels of care delivery.

Ethical perspective

Ethics in healthcare benefits patients, caregivers, communities, insurers, and healthcare facilities since altered ethical outcomes translate to poor patient outcomes and related legal implications on perpetrators. Patient education and awareness of medical terms increase the participation of patients in the treatment process; thus, core decision making engages both patients and caregivers. Consent from patients before any medical interventions prevents harm imposed on patients because of their lack of participation and understanding. Ethically, patients must fully understand medical terms, interventions, billings, and insurance benefits before accepting to take part in proposed interventions.

Healthcare delivery inclines towards four ethical principles that seek promotion of patient safety and wellness. **The autonomy principle** advocates for a patient's right over their body and health (Volandes & Paasche-Orlow, 2007). Caregivers take positions of advisors, but the final decision and actions that human bodies get subjected to must not be under any coercion or persuasion. In line with the autonomy principle, poor understanding of medical terms or health illiteracy denies patients the ability to make independent decisions concerning their health (Gold & McClung, 2006). Even though doctors could have a better knowledge of medical inputs and their benefits on patients, they should reveal both risks and positive impacts and allow patients to make final decisions. However, patients who lack an understanding of medical terms leave the whole decision-making process to caregivers. Adverse outcomes of some choices made with limited involvement of patients result in ethical and legal implications upon caregivers while the patient's life quality deteriorates.

The principle of beneficence targets the intention of caregivers, which must always be in favor of patients well being. A high level of skill and knowledge and evidence-based practice ensures that every input benefit patient and caregivers distinguish relevant interventions that suit individual patients. Patient education concerning medical terminologies ensures that patients reveal their desires and health goals to caregivers (Gold & McClung, 2006). Therefore, health practitioners apply the intended best interventions about patients' collaboration resulting in the wide scope of care delivery. The ethical principle of beneficence gives the best outcomes when caregivers and patients interact comprehensively. Patient education, therefore, promotes health literacy and enhanced patient-caregiver interaction meeting the ethical requirements of offering care with patients as priorities.

The non-maleficence principle prompts that caregivers must be careful in delivering healthcare such that no harm occurs to communities or individuals. Patient education aids in the clear elaboration of why caregivers reject some interventions and use selective ones based on avoidance of harm among patients and communities. Without patient education that facilitates understanding of common medical terms, caregivers could face resistance from patients who don't understand the risks and benefits of specific medical procedures. Consistency in patient education helps caregivers in collaboration with the target population are engaging interventions that cause minimal harm to individuals and communities.

The principle of justice requires that caregivers administer an aspect of fairness inclined to legal and ethical requirements every time they deliver healthcare services (Volandes & Paasche-Orlow, 2007). Fair distribution of scarce resources and new treatments reduces disparity in care delivery as per the concepts of justice. However, unless patients acquire credible levels of education that expose them to medical terminologies and processes, they can hardly enjoy the justice principle as they would barely distinguish between their rights and compromises. Caregivers could alter the principle of justice, thus compromising on quality outcomes among some vulnerable populations that lack basic health literacy.

From a practitioner perspective

Practitioners work under the boundaries of the medical code of ethics with the main aims focusing on the promotion of patient wellness. Patient's collaboration with caregivers begins at the assessment of medical issues where caregivers listen to complaints and offer evidence-based interventions. The relevance of education for common medical terms is that they improve the efficiency of care delivery among health practitioners (Cowen & Moorhead, 2014). Caregivers offer guidelines on the use of medications, physical therapies, and follow up targeting positive results among their patients. Common understanding of common medical terms facilitates communication

between practitioners and patients, thus enhancing self-managed care. Medical negligence outcomes implicate legal matters on care practitioners because of inadequate communication but decrease as patients get more awareness.

Patients could understand common medical terms differently from the doctor's perspective; thus, cause conflicts in care delivery approaches. Caregivers require cooperation from patients and their families for assured improvement in health outcomes. Without education of common medical terminologies however, a poor rapport between care providers and consumers could be experienced (Fage-Butler & Nisbeth Jensen 2016). The patient education, therefore, offers a platform for a basic understanding between care providers and patients thus lowers struggles of translating medical jargons to patients individually.

Healthcare practitioners spend a substantial amount of time trying to explain some medical terms to specific patients; hence, much time gets used up per patient (Fage-Butler & Nisbeth Jensen 2016). Long queues, delayed diagnosis and treatment, and omission of relevant information arise from the extensive duration caregivers spend in the elaboration of medical terms. Practitioners, therefore, get overwhelmed with the workload resulting in high rates of medical errors, low motivation, and inadequate satisfaction. Best patient outcomes incline towards satisfied and motivated caregivers. Because of the overwhelming task of explaining medical terminologies to the increasing number of patients, caregivers opt to keep changing work stations thus high rates of turn-over (Fage-Butler & Nisbeth Jensen 2016). Educating patients on common medical terms eliminates the problem of strained caregivers and gaps in care delivery, thus attaining the desired levels of patient outcomes.

Approximate of 19% of all adults in the United States, that is one in every five adult, lacks adequate literacy levels to comprehend at a high school level, let alone comprehending medical jargon. This low litracy level is one of the reasons that practitioners struggle with guiding patients with low literacy levels since it creates confusion and poor efficiency (Koch-Weser, Rudd, & DeJong, 2010). The increasing life span of the elderly linked to higher rates of chronic conditions requires prolonged care in self-managed setups, and hence even more discussions involving medical terminogolies. However, it is only through patient education focusing on common medical terms that literacy levels could improve and result in better health quality results.

Healthcare providers receive the education that prepares them for explaining medical terminologies to their patients. However, patients and their families undergo a wide range of caregivers in efforts to meet their medical demands. Despite the numerous efforts to standardize the education system of healthcare practitioners in the United States, different caregivers offer varying explanations for common medical terms (Gold & McClung, 2006). Common users who represent patients also have their unique format and understanding of common terms. For example, both caregivers and patients could have different definitions of abdomen, belly or tummy. Therefore, patient-centered and evidence-based interventions that offer education of medical terminologies creates a common ground of all practitioners. Because all caregivers use common terms to refer to similar meanings on account of the education eliminates confusion and enhances patient safety. As a care provider, patient education enhances efficiency, timeliness, and quality of care delivery hence fulfills medical ethics requirements. Reduced confusion among patients courtesy of education creates an aspect of accountability and responsibility among care providers since they lack any basis of blaming medical terminology issues in cases of negligence.

From the patient perspective

Patients regard their caregivers as sole partners in the recovery process. Using medical terminologies unfamiliar to patients leads to isolation in patients where they leave the mandate of decision-making entirely to caregivers (Koch-Weser et al., 2010). For example, practitioners propose medical interventions and mention benefits and risks; but the use of complex terms limits patients from weighing out options and caregivers end up making the final say on what ways the patient follows.

Communication and the transition of care among patients face challenges because of a lack of patient education. Competent education regarding medical terminologies creates a sense of independence, responsibility and self-managed care among patients (Koch-Weser et al., 2010). Chronic diseases, which form the leading threats of patient life quality, involve huge resources and time in physical visits to doctors, readmission and morbidity. Implementing patient education, however, enlightens the affected population by guiding them on how to engage available resources and space in meeting their health needs. Therefore, patients take part in the recovery process facilitating the goals of health accessibility among universal populations.

A patient who understands medical terminologies portrays high levels of health literacy and minimal chances of experiencing errors that relate to wrong medication administration and wrong therapeutic follow-ups (Cowen & Moorhead, 2014). Beyond the individual benefits of patient education, families and communities of the educated people benefit, thus the public health domain receives significant benefits. Even though health practitioners in the United States medical system provide efficient diagnosis and treatment, limited education reaches patients concerning medical conditions, procedures, and interventions. Therefore, only less than 50% of all chronic condition patients follow the recommendations offered by their care providers (Cowen & Moorhead, 2014). Patient education forms a significant part of recovery and enhanced involvement of the patient in care interventions. Taking responsibility for medical conditions and procedures increases compliance among patients, thus meeting an overall improved quality of health.

Billing and coding in the American healthcare incline towards significant terminologies like reimbursement, the fee-for-service, and premiums. Patients who show limited comprehension of such terms easily experience errors in billing, forcing them to go through rigorous processes of rectifying the mistakes (Kee, Khoo, Lim, & Koh, 2018). Some patients experience delays, and prolonged hospital stays because of errors that relate to billing, hence file complaints on poor service delivery. Understanding of medical terminologies increases patient satisfaction since patients feel that they move in correlation with caregivers guidelines. Patients, therefore, get eager and readily take part in decision making and recovery interventions.

The American Health Information Association categorizes medical terminologies into administrative, clinical, reference, and interface terminologies (Kee et al., 2018). The codes facilitate effective communication among caregivers; thus, patients get relieved from getting new assessments and treatments every time they visit new care practitioners. Through patient education and standardization of care through awareness of medical codes eliminates time and cost of repeated procedures.

Because caregivers meet a wide range of patients daily, they may lose track of patients' charts and medical history. Subsequent caregivers like nurses and pharmacists could also struggle in interpreting the directions of consultants from medical history charts. However, patient education and standardization of medical terminologies allow patients to take part in explaining to subsequent practitioners about their health conditions and recommendations (Kee et al., 2018). The time that would erupt in a physical explanation of medical charts, billings, and interventions allows caregivers to meet more patients and less waiting times among patients are experiencing. Therefore, errors that arise from delayed diagnosis and treatments compromise patient safety and satisfaction thus education on medical terminologies cuts across all desired benefits of patients' life quality outcomes.

From insurance perspective

Health care insurance coverage plays crucial roles in facilitating payment of patient medical services. The insurance companies work in collaboration with the state and federal governments, patients, and care providers. Medical terminologies that affect these parties, therefore, must be standardized for the efficiency of reimbursement services. Insurance coverage exemplified by Medicare and Medicaid in the American healthcare system caters to a specific population, health conditions, and services thus the need for comprehensive understanding among patients (Graham & Brookey, 2008). Limited health literacy, therefore, acts like an epidemic and strains the insurance systems because of the occurrence of preventable health complications linked to poor understanding among patients.

Health status, outcomes, use, and cost, face adverse impacts because of the high levels of medical illiteracy where nearly 50% of the United States population lacks an adequate understanding of medical terminologies (Koh, Berwick, Clancy, Baur, Brach, Harris, & Zerhusen, 2012). The healthcare system, therefore, works on the assumption that patients can navigate the complex aspects and adhere to rules of insurance coverage, therapeutic follow-up, and billing. The comprehension of medical terminologies through patient education forms a significant part of health literacy.

Unfortunately, even young people in colleges and universities in the American system lack basic skills in interpreting these terminologies. Unlike privately insured patients, publicly insured populations portray lower levels of literacy concerning medical terms (Koh et al., 2012). Uninsured adults and those insured by Medicaid and Medicare reveal the lowest levels of health literacy in the entire population. The insurance personnel, therefore, face challenges of offering services to patients with limited knowledge of information that dictate the premiums, costs of care, guaranteed services and compensations.

Patients who seek emergency care and repeated hospitalization significantly increase the cost of care. Insurance companies part with substantial amounts of money due to these emergent cases, most of which arise from errors and low literacy that limit adherence to medical advice. A randomized controlled study by Koh et al., (2012) confirms that patient education geared towards a better understanding of medical terminologies and taking part in the treatment process enhanced care transition and reduced hospitalization by 30%. Increased patient education could decrease the cost of care among chronic condition patients by at least $10,000 per individual (Cowen & Moorhead, 2014). Insurance companies, therefore, face limited financial challenges on account of patient education since avoidable medical conditions that strain finances get eliminated.

Shared savings in Medicare-related expenses focuses on offering incentives to caregivers, thus working together for the promotion of patient quality of life and safety. The collaboration effectiveness highly depends on health literacy and understanding of medical terminologies for facilitated patient engagement in the recovery process. Accountability signifies a crucial concept among the insurance industry where the role of funding patient care aligns with needs, policies, and regulations (Parker, Ratzan, & Lurie, 2003). Patients with a comprehensive understanding of the links between insurance companies, premiums, legal, and ethical inclinations facilitate the process of medical coverage and increase satisfaction levels among all the involved parties.

Health policy debates in The American healthcare system of Medicare and Medicaid focus on patients' bill of rights and privacy of health information with assumptions that the target population comprehends the medical terminologies (Parker et al., 2003). However, in the absence of patient education, Medicare beneficiaries cannot calculate the affordability of the coverage and needs for supplemental insurance. The proposed bill of rights offers Managed care beneficiaries a platform for external appeals in case of disputed claims (Parker et al., 2003). The patients must be well equipped with an education that pertains to medical terminologies and processes for the best benefits of rights created under insurance-based legislation. Patient education adds value to the insurance companies as the target populations enjoy maximum benefits of proposed bills and compensations.

Time investment for health literacy by different entities

Patients

Health literacy attained through patient education determines access, navigation, processing, and communication regarding care. The fact that only one in ten adults reveal health literacy in the United States healthcare system confirms the time spent by patients who follow wrong medical guidelines, get readmitted and dependent, thus prolong the duration of recovery (Rasu, Bawa, Suminski, Snella, & Warady, 2015). Low

understanding of medical terminologies limits patients from frequent seeking care and also prolongs the duration between care-seeking and receiving.

The illiterate patients rely on caregivers for the elaboration of medical terms, and the transition of care from hospital to homes takes a toll on them. The patients experience high rates of disease recurrence because of medical errors on following instructions offered by caregivers. Therefore, the system experiences delays because of time is taken to explain to patients about used terminologies and procedures, emergency treatment of conditions linked to poor literacy, hospitalization, and readmissions. Bill of rights and other legislation relating to best patient outcomes reflect health utilization aspects that patients do not enjoy because of limited education and awareness (Rasu et al., 2015). By the time patients realize that the benefits are part of their rights, health conditions deteriorate wasting their resources and productivity.

In some scenarios, patients with minimal patient education spend little time with consultants since they lack a basis of engagement (Rasu et al., 2015). Such patients leave the whole aspect of decision making to doctors translating to low levels of satisfaction and subsequent adverse health outcomes. Patient education promises less time spent in seeking and receiving healthcare among patients and minimal duration in recovering especially in cases of the transition of care. Patient educations in the American healthcare system facilitates fewer emergency department visits, fewer hospital admissions, more screening to prevent disease and increase medication adherence and few dosing errors thus saves time spent in adverse health outcomes.

Providers

Burnout among physicians and nurses explains the adverse outcomes of inadequate patient education. In the era of evidence-based practice and increased chronic conditions, patients who lack understanding of medical terminologies get limited access to self-managed care thus burdening care providers with roles of facilitated care in hospitals (Reith, 2018). Between the years 2013 and 2017, burn out rates among physicians and nurses grew from 41% to 53% (Reith, 2018). The increase was caused by handling many patients for extended durations because of a lack of education meant for independence and self-care. 37% of nurses in nursing homes and hospitals experience burnouts because of the high levels of dependence among patients since the majority lack health literacy that could promote collaborative care delivery.

On average, physicians in the United States work for 51 hours per week, while 25% of these physicians spend over 60 hours weekly at work (Reith, 2018). Lower satisfaction among patients and caregivers linked to the many hours of working relate to poor comprehension of terminologies. Implementation of patient education for value addition could lower the number of time caregivers spend with each patient, hence facilitating better patient outcomes and caregiver satisfaction.

Insurance/reimbursement

The increasing healthcare costs relate to low patient education whereby errors in billing, medications, and medical procedures translate to poor patient outcomes forcing the reimbursement system to experience alterations. Health insurance companies face confusion and legal implications because of errors linked to a compromised understanding of medical terminologies, rights, and processes among patients. Promotion of patient education and awareness, therefore, creates standardized inputs from insurance companies and payment of physicians reducing the time spent in rectifying the mistake.

A new role for pathologist

Pathologists play a central role in care delivery because they evaluate the cause of disease and injury. Since pathologists determine the cause of injury and disease, their input in patient education forms a root solution to

medical errors and gaps that arise from health illiteracy. Laboratory tests and results form the largest scope of medical terminologies that could alter the quality of care delivery thus the significance aspect of pathologist incorporation in patient education.

Participation in advocacy of credible patient outcomes, leads tofacilitatition of patient awareness of medical terms. Diagnosis and monitoring of disease based on laboratory samples define the engagement of pathologists in explaining outcomes to patients through doctors since pathologists may never meet face to face with patients (Romano, Allen, & Blessing, 2015). Pathologists, therefore, face daily use of medical terminologies meant for collaborative diagnosis and follow up of health complications. The capacity of pathologists resembles that of physicians apart from the fact that they specialize in using laboratory samples for patient diagnosis and monitoring. Laboratory outcomes of samples like blood, sputum, urine, and biopsy are outlined using special medical terminologies that could hinder patients from understanding.

Nurses and physicians deal with symptoms and signs of disease as outward manifestations. Pathologists however work behind scenes in analyzing laboratory samples that reveal causal factors in disease (Cowen & Moorhead, 2014). The bridge between disease causes, manifestations and treatments exists on account of interaction between pathologists and consultants. , the specialization in laboratory samples creates a significant need for patient education since vital measures in laboratories have complex definitions and meanings. Pathologists understand these terms since they take part in preparation of reports that guide physicians on relevant therapies (Romano et al., 2015). Incorporating pathologists in patient education regarding medical terms increases the scope of efficient care delivery and minimized errors.

Pathologists play a fundamental role since laboratory results offer factual elements of diagnosisn and treatment. Comprehensive understanding of medical terms among physicians, nurses, and patients incline towards knowledge and efficiency of pathologists hence their significant roles in patient education (Cowen & Moorhead, 2014). Pathologists from the collaborative elements that untite all care givers and patients. The attainment of standardized medical terms therefore translate to standardized care delivery and evidence based patient outcomes.

Consultants, patients, nurses, and families of patients must all understand common meanings of terminologies used by pathologists for ease of treatment and adherence to medical guidelines. The laboratory analysis revealed through the role of pathologists portrays the causes of disease, thus informing patients and caregivers on best interventions and management. Implementation of patient education relates to pathologists role of explaining medical terminologies obtained from laboratory results to caregivers and patients for standardized treatment procedures (Romano et al., 2015). Gaps in pathology data could cause poor diagnosis, thus time wastage, medical errors in treatments and related legal complications. Pathologists, therefore, form a core function of patient education since their central role in healthcare influences the competence of all caregivers and patients interventions and adherence.

Education, motivation, and activation are crucial roles exhibited by pathologists in the United States healthcare system based on the huge number of medical errors that compromise care outcomes and increase the cost of care (Cowen & Moorhead, 2014). Engaging pathologists in patient education eliminates gaps that result in altered patient outcomes and compromised delivery among caregivers. The insurance companies, health facilities, federal governments, and public health facilities must increase the scope of patient education by involving pathologists who take a central role in the determination of disease causes, thus facilitate diagnosis, treatment, and recovery.

Correlation between healthcare literacy rates and healthcare costs

In the American healthcare system, low literacy increases healthcare costs by $30 - $73 billion yearly (Kee et al., 2018). Public health systems mostly insured through Medicaid and Medicare account for 63% of the additional costs of care linked to the poor understanding of medical terminologies. The increased rates of chronic

conditions cost the nation at least $590 billion annually. By the year 2020, the cost could have doubled, resulting in increased financial inputs from the insurance companies (Koh et al., 2012). The incidence of chronic conditions is expected to rise whereby 150 million Americans will have one chronic condition, and 60 million people will have two or more of these conditions by the year 2020. The elderly population carries the greatest burden of chronic conditions, yet they portray the lowest levels of health literacy (Koh et al., 2012). Therefore, implementation of patient education among the American population creates a significant improvement in health literacy levels, lowers medical costs, and increases patient safety saving the insurance organizations high levels of complexity.

DISCUSSION

Recommendations

Health literacy facilitates the meeting of policy demands existing in the United States healthcare system. The Patient Protection and Affordable Care Act, applies a wide range of terminologies targeting culturally and Linguistically Appropriate Standards (CLAS) designed by the U.S. Department of Health and Human Services (Hudson, Rikard, Staiculescu, & Edison, 2018). ACA emphasizes that health literacy must be a part of all health care training for ease of complying with the medical terminologies and processes (Hudson, Rikard, Staiculescu, & Edison, 2018). Signing up for health insurance in line with the ACA inclines towards the ability of patients to understand health terms and guidelines. Those who offer insurance coverage must write summaries in manners that patients comprehend what their plan covers and how including clear and concise health information. The rules state that health care providers must teach patients in a way that gives the patient the chance to know what to do for the attainment of good health.

Here are some suggested recommendations that providers and institutions should consider when devising appropriate patient-professional communication model:

- Furnishing resources for patient based education at all departments of healthcare facilities prompt awareness of medical terminologies;
- Encourage public health campaigns that target patient education and awareness;
- Creation of policies that target patient education of medical terminologies and improved health literacy among all populations;
- Carry out monthly analysis of patient outcomes and costs linked to patient education thus reveal gaps and best ways of addressing the issues;
- Involve pathologists, other clinical professionals, as well as all healthcare leaders and personnel in the education processes;
- Frequently evaluate if the patient education efforts are working or not.

Table: Examples of Common Terms and the Recommended Language

Common Used Terms	Recommended Language
Hemoglobin test	Measures levels of hemoglobin protein in blood since it carries oxygen around the body
Serum glucose concentration	The concentration of sugars in the blood linked to diabetes
Complete blood count (CBC)	Evaluation of the levels of all types of blood cells including red, white, plasma and platelets. For example, infections lead to levels of white blood cells beyond normal, while anemia causes low levels of red cells.
Electrolytes Panel	Blood measure testing levels of carbon dioxide in blood and minerals like sodium and potassium in the body
Total Protein	The total amount of proteins (albumin and globulin) found in the fluid portion of the blood
Gram Stain	Method of staining used to distinguish the kind of bacteria in a human sample
Bacterial culture	Growth of microorganisms in nutrient media and controlled conditions thus determine the exact bacteria causing disease
Platelet count	Level of blood cells that facilitate clotting of blood during injuries

Biopsy	Checking of sample tissue under a microscope to detect cancer cells

CONCLUSION

The study reveals medical terminologies as crucial parts of health literacy needed in the U.S healthcare system. Poor patient outcomes linked to hospitalizations, deaths, and morbidities reveal the value that patient education could cause on the American population considering that public health faces higher levels of illiteracy. Caregivers could also face higher levels of satisfaction and limited legal and ethical complications because of the enhanced interaction and care delivery caused by patient education. Lowered costs of care and limited confusions and errors in reimbursement and billing also relieve the overburdened insurance system in the United States. For best impacts and value of patient education, it must involve pathologists who form a basis in care delivery to the maximum alongside other caregivers in patient education and orientation of using medical terminologies. Patient education creates a promise of time effective, affordable, accessible, and quality care in the American healthcare system that faces many challenges.

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GROUPONS IN HEALTH CARE: NECESSITATED BY A LACK OF PRICE TRANSPARENCY

Marcia Butler, Clayton State University
Joey Helton, Clayton State University
Deborah Gritzmacher, Clayton State University

ABSTRACT

Lauren Weber, (2019) speculates about the philosophical versus the realities of medicine as seen today. Is healthcare a business? Does that entail a market place? Some suspect that the United States' healthcare system is broken and anything that makes care more accessible is a positive thing. Groupons have started to fill that niche and have brought prices down. Tim O'Reilly's definition (2005) of Web 2.0 was: "An umbrella term that refers to an assortment of advances in internet technologies, marked by increases in rich media, dynamic content, social networking elements, and distributed contributions." Thus starts the growth of Groupons from Web 2.0-Based Business Models to become E-Commerce for healthcare.

Social networking created an opportunity to address customer demands in an environment where health care cost are at times unreasonable, and have become unaffordable for people on a fixed income and for those who are required to have expensive procedures approved by an authorizing team. People with little or no insurance are severely compromised when most aspects of diagnosing require technology including computed tomography (CT) or computerized axial tomography (CAT scan) and magnetic resonance imaging (MRI). CT or CAT scan can reveal anatomic details of internal organs that cannot be seen in conventional X-rays. *MRI* uses a strong magnetic field and radio waves to create detailed images of the organs and tissues within the body. It is especially useful for looking at soft tissues and the nervous system. Both are not at all uncommon and can cost thousands of dollars if scheduled traditionally. In one instance a patient was told to schedule a CT through the provider's office. She did as told and the cost was $2,200.00. Her insurance company called to share with her that an independent imaging center was closer to her home and would have cost $250.00

Groupons for healthcare services appeared as early as 2111 and have waxed and waned. They are making a remarkable recovery and are on the rise again in the healthcare environment. A remarkable variety of services are offering Groupons. Nicholas Halliwell, in an email to Lauren Webber, states: "Our market place of local services brings affordable dental, chiropractic, and eye care, among other procedures and treatments to our more than 46 million customers daily and helps thousands of medical professionals advertise and grow their practices."

Research on services offered in October of 2019 revealed conventional health necessity treatments such as lab test, sleep apnea studies, psychosocial counselors, and cardiac scores and as mentioned, CT and MRI. Additionally, cosmetic and vanity amenities are also offered. They range from B-12 injections, Laser toenail fungus treatment, body sculpting, Laser-Lipo treatments, and Ultra Sonic Cavitation treatments.

BAD BEHAVIOR AND A WHISTLEBLOWER LABEL: HOW TO HANDLE THE SITUATION

Ronald Fuqua, Clayton State University
Elliott Aronson, Emory Healthcare
Deborah Gritzmacher, Clayton State University

ABSTRACT

Ethan is a manager in a large health care system involved with the operation and maintenance of the system's electronic health record system. He has a Bachelor of Science degree in health care management and has worked for several health care companies since his graduation. Ethan has been labeled a "whistleblower" within his company because he experienced a discriminatory insult from his supervisor and peers that he reported to Human Resources. As a result, he has been passed over for a number of promotions which he feels is the result of his whistleblower status. What are possible options for Ethan?

Introduction: Ethan has diabetes and as a result has hearing loss requiring the use of hearing aids. While having his hearing aids serviced and adjusted, he was without them for a few days. During this time, he attended a departmental meeting led by his supervisor. He explained to his supervisor and those attending the meeting that he might have to look at them closely to hear what they were saying and that he was not staring or being rude. During the meeting, his supervisor pretending to speak, without making any sounds and Ethan saw that his peers were laughing. When asked why, his supervisor told him he was just making a joke and meant nothing by the act. Ethan found it offensive and did not think it was professional. He decided to report the event to Human Resources for appropriate resolution. The HR representative ultimately shared the information reported with Ethan's supervisor. Ethan felt that he had been let down by the actions of the HR Representative. He learned that he was being referred to, informally, as a "whistleblower" and felt it was being used against him since his interests in promotions were not being successful.

Eventually, Ethan began pursuing jobs with other health care organizations and has a promising opportunity with a nationally recognized university and health care system. He shared the whistleblower situation with some friends because he felt he had been mistreated and felt that the only recourse he had resulted in him being unfairly labeled and ostracized. He appreciated the next career opportunity which might be his but feels the result is he must move and distance himself from his friends and family. All he had done was recognize his mistreatment and seek resolution from the organization using the appropriate complaint process.

In reviewing these facts, certain considerations rose to the surface. These included Ethan's hearing impairment and the Americans with Disabilities Act of 1990 as amended in 2008 (ADA). Also, the appearance of a hostile work environment which falls under the auspices of the Equal Employment Opportunity Commission (EEOC) of the Federal Department of Labor (DOL). Finally, the employment compliance environment of corporate America has created the existence of a "grievance" procedure that affords companies a first-line-of-defense against complaints of discrimination when employees do not utilize the existing process for addressing such complaints internally before taking them to the EEOC or outside council. Ethan followed his organization's grievance procedure, insofar as he went to Human Resources to report his concern.

Alternatives: What occurred in this case was unfortunate because an employee became displeased with his supervisor and chose to report his situation to Human Resources. The supervisor was at least disrespectful and damaged the relationships with a member of his team. The HR representative was unprofessional in informing Ethan's supervisor and arming him with information that could be used against Ethan. Finally, a competent employee chose to leave the organization primarily as a direct result of this situation. In health care, employee turnover is a problem that must be addressed for the sake of improvement and not be exacerbated, as was the case here.

Several alternative outcomes could have occurred. Exploring these alternatives provides an opportunity to learn from the mistakes of others. While these are all hypothetical, they could have been the outcome. Each has its own set of costs that are real, however.

One possible outcome could have involved Ethan, the disgruntled employee, pursuing an ADA claim with the EEOC. This would have involved the health care organization receiving a charge letter from the commission. This starts a process of correspondence with the EEOC acknowledging the charge and the commitment to investigate and provide a response to the charge. Then each person named in the charge would have to be interviewed and their statement written and signed. Any additional named individuals would also be interviewed, and statements created. Through the formalization of the investigation, the company would do its best to defend the company and its actions. Finally, a response to the charge would be written and sent to the EEOC. A decision from the EEOC could result in an offer to mediate, the acceptance of the claim by the EEOC to sue on behalf of the employee, or a right-to-sue letter being issued to the employee. All this activity is time consuming and costs the company, regardless of the outcome.

Since the disability implied here is hearing impairment, the responsibility under the ADA rests with the employee to notify the company of the disability. An interactive response from the company is required to determine if an accommodation is warranted. Since this was not done prior to the incident of this case, the ADA probably does not apply.

Another alternative for this case would involve the pursuit of a hostile work environment claim with the EEOC. Again, the process outlined previously would be followed and the same time and expense requirement would be incurred by the company. The same possible outcomes exist, with an offer to mediate a settlement, the EEOC suing on behalf of the employee, or a right-to-sue letter being issued to the employee. In the consideration of a hostile work environment, harm to the employee must be shown. Since promotions were denied, harm would only be supported if the employee was best qualified but not promoted. That is a difficult standard to prove.

It should be noted that the employee's use of the company's internal complaint or grievance procedure removes one defense the company could have used in their response to the EEOC for either of these alternatives. A standard comment in many responses to the charge letters is that the company provides a means of lodging a complaint and for the wronged employee to seek redress internally and that was not the case. This is seen as a failure of the employee and that the charge is not as serious as the employee has claimed to the EEOC. In this case, Ethan did seek redress when he contacted Human Resources. As such, it weakens the company's response to either charge. Also, if the employee had chosen to involve a personal attorney in either of these alternatives, the time and expense associated for the company would have increased.

A third alternative would have been that the supervisor recognized the impact of his actions at the time that Ethan asked why he did the act. The supervisor could have responded with a sincere apology absent any explanation of real or purported intent. He could have talked with Ethan as soon as the meeting was over to ensure that he resolved Ethan's concerns and taken whatever action required to make appropriate amends. The supervisor could also have discussed the inappropriate nature of his action with each of the other attendees at the meeting one-on-one and to emphasize the mistake he made was not appropriate. Finally, he could have been an active supporter in Ethan's desire for promotion and mentored him as needed for advancement within the company.

Solution: In an ideal setting, the act of Ethan's supervisor would not have happened. Effective training at the supervisor level, as well as an effective program that emphasizes respect and trust in the workplace would have been invaluable. The company could have had an emphasis on employee satisfaction and engagement that would have influenced the conduct of all meetings and the employee development appropriate for everyone in the company.

Recommendation: A strategic human resource plan should be developed, aligned with the strategic plan of health care organization, to produce the outcome identified in the solution. Preparing the organization for the future is the most efficacious route this company can take. While an employee was lost, the less desirable alternatives did not materialize. Correcting the culture now and for the future will provide not only the best defense against future similar situations but also provide the right human resource culture for this health care organization.

TRACK

HEALTHCARE ECONOMICS AND FINANCE

DID THE CMS VALUE-BASED PAYMENT SYSTEM IMPROVE THE QUALITY OF CARE?

Elmer B. Fos, D'Youville College
Kathleen Curtin, D'Youville College

ABSTRACT

Beginning in October 2012, the Centers for Medicare and Medicaid Services (CMS) rewards or penalizes hospitals based on a set of quality measures following the directives set forth by the 2010 Patient Protection and Affordable Care Act. The Hospital Value-Based Purchasing Program (HVBPP), which ties payment to performance, is one of the three hospital value-based payment programs implemented by CMS to incentivize hospitals to improve the quality of care to Medicare patients. This study finds that the CMS HVBPP achieves its purpose of linking incentives to improvement as measured by the total performance score for hospitals in New York State.

INTRODUCTION

The Centers for Medicare and Medicaid Services (CMS) reimburse hospitals for the care of Medicare beneficiaries based on a prospective payment system. In 2010, the Patient Protection and Affordable Care Act (PPACA) established the Hospital Value-Based (HVB) Programs, which replaced pre-existing regulations with three programs. Beginning with the fiscal year 2013, all hospitals are subject to all three HVB Programs, namely the Hospital Readmissions Reduction Program (HRRP), Hospital-Acquired Condition Reduction Program (HACRP), and the Hospital Value-Based Purchasing Program (HVBPP) (CMS.gov, 2019).

Hospital pay-for-performance and quality of care

In 2016, a systematic review of healthcare pay-for-performance programs as of 2012 found the first modest improvements in process of care. In 2017, an additional 69 studies were reviewed using the same methodology and included both ambulatory (58) and hospital settings from ten countries. As with all previous studies, there was no evidence of improvements in patient outcome measure such as mortality and morbidity rates. The 2017 study did identify evidence of improvement in ambulatory process measures and in hospital readmissions while expressing concern for methodologic rigor (Mendelson et al., 2017).

In 2019, a Cochrane Review reported on hospital pay for performance programs from 29 studies; 24 from the United States (US), two from England and one from France. All payer types were studied including public, insurer and private pay. The hospital programs studied in the US included the three Hospital Value Based Payment Programs. The Cochrane analysis of HAC Programs from 3568 hospitals did show reduced number of infections and pressure ulcers. The studies of Hospital Readmission Reduction Programs showed "no or only a very small reduction in readmissions" (Pieper, p.15). The analysis of the HVBP Programs included 6000 hospitals and found "mortality reduced and process quality scores increased" (Pieper, p.15). However, based on the Cochrane evaluation the certainty of the evidence was low for all three programs.

Overall, studies of hospital pay-for-performance consistently refer to the complexity of implementing and evaluating the impact of healthcare value-based payment programs. Implementation challenges include the incentive design including the appropriate percentage for incentives and penalties. As an example of program variation, England's Advancing Quality Program offers a 30% incentive which varies dramatically from US hospital incentives and penalties that fall in the one to three percent range (Mathes et al., 2019). It is also challenging to determining the extent to which confounding external factors influence performance measures. Pay-for-performance programs in healthcare have been enabled by the expansion of health information technology and the introduction of the electronic

health record. These are dramatic changes for the US healthcare delivery system and they have occurred in less than 10 years.

The hospital value-based purchasing program

The HVBPP is the subject of this study. This budget neutral program is funded by a two percent reduction in hospital payments. The program may result in a penalty as do the two other programs. Distinctive for this program is the possibility of an incentive payment depending on performance (AHA.org, 2019; CMS.gov, 2019). In 2018, 57% (1,597) of the hospitals broke even or received a bonus at a maximum of three percent while 43% (1,211) were penalized (Brown, 2018).

The incentive or penalty payments are calculated annually based on the hospital's total performance score (TPS), which is calculated for each hospital based on quality measures in the four categories of safety, clinical care, cost, and patient satisfaction. The safety measures include a subset of the HACRP with some variation in the calculation method. The clinical care measures are the aggregated mortalities within 30 days of discharge for acute myocardial infarction, pneumonia, health failure, and complications following total hip/knee replacement. The cost measure is established by calculating the cost per Medicare patient. Finally, the satisfaction measure is calculated based on results from the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) Survey (Medicare.gov, 2019).

Previous studies indicated a weak link between HVBPP and quality of care (Delbanco, Lehan, & Murray, 2018; Mathes et al., 2019). However, the HVBPP is an evolving measure (Borah et al., 2012). The payment program has undergone several policy changes since it began in 2012 and will continue to evolve in the coming years (Brown, 2018). This study examines the HVBPP quality measures of CMS-certified hospitals from 2013-2019 to determine if the HVBPP incentivized hospitals are able to improve the quality of care.

METHODOLOGY

We considered all the 148 CMS-certified, acute care hospitals in New York State as study hospitals based on the list of American Hospital Directory. However, we dropped 13 hospitals as samples because of missing quality measures data. We were left with 135 study hospitals, which represent 91% of all CMS-certified, acute care hospitals located in the state of New York. We obtained and compiled the quality measures of the 135 study hospitals from the American Hospital Directory. Table 1 shows the characteristics of the study hospitals.

The main outcome variables of the study are the hospitals' total performance scores (TPS) national percentile rank and the corresponding payment adjustments from fiscal years 2013-2019. We analyzed the hospitals' TPS national percentile rank and the payment adjustments under the CMS value-based purchasing payment program from 2013-2019. We performed longitudinal and cross-sectional analyses on the data we gathered.

The TPS is a composite score of the following four domains: (1) clinical process of care, (2) patient safety, (3) patient experience of care, and (4) efficiency or cost reduction. Each domain has a weight of 25%. A TPS close to 100 indicates superior quality of care. The TPS national percentile rank represents the TPS score of a hospital in relation to all CMS-certified hospitals across the United States. The payment adjustment (bonus or reduced payment) is the consequent outcome of the hospital's TPS.

Study Limitations

The study focused on the experiences of acute care hospitals in the state of New York. Therefore, the findings might not be generalizable to other areas. Nevertheless, we assumed that the value-based payment performance of the hospitals in the state of New York is a microcosm of the United States hospitals' value-based payment experience. Also, the study examined only the CMS Value-Based Purchasing Program. CMS has two other pay-for-performance structures (Hospital Readmissions Reduction and Hospital Acquired Infections), which we did not

include in the study.

RESULTS

The study hospitals have exhibited significant improvement in quality metrics over the years (Figure 1). Their average TPS national percentile score rose to 47 in 2019 from 33 in 2013, *p= <.0001* (Table 2). As a reward for the improved quality of care, the study hospitals received an average of 0.10% pay adjustment (bonus) in 2019, a significant improvement compared to 2013, where the study hospitals' reimbursements were reduced (penalized) by 0.13%, *p= <.0001* (Table 3) .

Hospitals with total facility beds of 500 or less showed significant higher increases in TPS national percentile score and pay adjustment compared to hospitals with > 500 beds, *p=0.0002-0.0414* (Figure 2). Similarly, hospitals with star ratings of two-star, three-star, and four-star showed significant growth in pay adjustment than hospitals with one-star, *p=0.0020-0.0111* (Figure 3). Also, non-teaching hospitals showed significant higher increases in TPS national percentile score as opposed to teaching hospitals, *p=<.0001* (Figure 4). Surprisingly, hospitals located in rural and micropolitan areas showed significant higher increases in the TPS national percentile score compared to hospitals in metropolitan areas, *p=0.0004-0.0023* (Figure 5).

DISCUSSION

Our study shows the HVBPP resulted in a significant improvement in the Total Performance Scores of New York State hospitals. This would suggest the possibility that the incentive program produces improvement in some or all the four measurement categories of safety, clinical care, cost reduction, and patient satisfaction. In addition, the results are reassuring to the smaller hospitals (<500 beds) and those hospitals located in the rural areas. Earlier studies were suggesting that the CMS pay-for-performance schemes might have unintentionally placed the smaller hospital organizations at a financial disadvantaged over their large counterparts (Fos, 2017). The policy changes that the CMS has introduced to the HVBPP over the years might have helped prevent this unwanted consequence from happening. Or it could be that the smaller hospital organizations might have been more worried about the impact of the penalties on their financial performance than their larger counterparts. Thus, necessitating the much-needed quality improvement in care to avoid being penalized in the form of reduced reimbursements of *all* their Medicare charges. Also, the findings suggest that quality improvement initiatives might have been relatively easier to implement and manage in smaller hospital organizations than in large hospital systems.

CONCLUSION

The CMS value-based pay-for-performance program achieves its intended purpose of linking payment to high-quality care, at least in the state of New York. The data suggests that the Hospital Value-Based Purchasing Program incentivizes hospitals to implement effective quality improvement initiatives in the areas of clinical process of care, patient safety, patient care experience, and efficiency or cost reduction.

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TABLES

Table 1. New York State Hospitals Included in the Study

Characteristic	N = 135	Percent
Type		
For-profit	1	0.7
Governmental	18	13.3
Not-for-profit	116	85.9
Facility beds		
≤ 100	13	9.6
101 - 200	33	24.4
201 - 500	59	43.7
> 500	30	22.2
Teaching status		
Non-teaching	43	31.9
Teaching	92	68.1
Star-Rating		
One-star	47	34.8
Two-star	41	30.4
Three-star	35	25.9
Four-star	12	8.9
Location		
Metropolitan	112	83.0
Micropolitan	19	14.1
Rural	4	3.0

Table 2. New York State Hospitals TPS National Percentile Rank, 2013 - 2019

	N	2013	2014	2015	2016	2017	2018	2019	*p-value* [a]	
New York state hospitals	135	33	37	43	38	40	45	47	<.0001	*
Type										
For-profit	1	51	59	68	29	76	91	93	-	[b]
Governmental	18	15	26	32	27	35	36	42	0.0026	*
Not-for-profit	116	36	38	44	40	40	46	48	0.0005	*
Facility beds										
≤ 100	13	32	32	54	55	45	61	66	0.0074	*
101 - 200	33	36	34	47	50	50	58	57	0.0007	*
201 - 500	59	35	37	43	33	34	38	45	0.0409	*
> 500	30	28	41	33	30	38	39	33	0.2989	
Teaching status										
Non-teaching	43	36	35	52	53	53	62	62	<.0001	*
Teaching	92	32	38	38	31	33	37	41	0.0138	*
Star-Rating										
One-star	47	25	29	30	21	23	29	34	0.1199	

Two-star	41	31	36	44	39	41	48	50	0.0005	*
Three-star	35	39	45	52	51	53	58	55	0.0152	*
Four-star	12	55	51	63	65	62	63	67	0.2526	
Location										
Metropolitan	112	33	38	41	34	35	40	44	0.0023	*
Micropolitan	19	34	30	51	62	66	68	63	0.0004	*
Rural	4	31	51	60	49	51	81	67	0.0059	*

[a] p-value of the mean difference between 2019 and 2013 TPS National Percentile Rank using paired t-test

[b] Only one observation, paired t-test not applicable

** Mean difference (increase) between 2019 and 2013 is significant at 0.05 confidence level*

Table 3. New York State Hospitals Value-Based Purchasing Program Pay Adjustments, 2013 - 2019

	N	2013	2014	2015	2016	2017	2018	2019	*p-value* [a]	
New York state hospitals	135	-0.13%	-0.17%	-0.02%	-0.02%	-0.09%	0.03%	0.10%	<.0001	*
Type										
For-profit	1	0.02%	0.04%	0.26%	-0.15%	0.64%	1.19%	1.19%	-	[b]
Governmental	18	-0.30%	-0.28%	-0.17%	-0.21%	-0.01%	-0.12%	-0.02%	0.1387	
Not-for-profit	116	-0.11%	-0.16%	-0.01%	-0.01%	-0.09%	0.04%	0.11%	0.0001	*
Facility beds										
≤ 100	13	-0.12%	-0.21%	0.14%	0.27%	0.06%	0.19%	0.56%	0.0114	*
101 - 200	33	-0.13%	-0.20%	0.02%	0.23%	0.14%	0.37%	0.30%	0.0002	*
201 - 500	59	-0.12%	-0.16%	-0.03%	-0.14%	-0.22%	-0.13%	0.05%	0.0414	*
> 500	30	-0.17%	-0.14%	-0.15%	-0.19%	-0.15%	-0.11%	-0.20%	0.7885	
Teaching status										
Non-teaching	43	-0.11%	-0.18%	0.12%	0.26%	0.23%	0.38%	0.42%	<.0001	*
Teaching	92	-0.15%	-0.17%	-0.10%	-0.16%	-0.24%	-0.13%	-0.05%	0.0895	
Star-Rating										
One-star	47	-0.23%	-0.26%	-0.21%	-0.33%	-0.45%	-0.29%	-0.19%	0.6941	
Two-star	41	-0.14%	-0.18%	0.00%	-0.02%	-0.08%	0.10%	0.14%	0.0031	*
Three-star	35	-0.07%	-0.09%	0.11%	0.23%	0.20%	0.24%	0.27%	0.0020	*
Four-star	12	0.08%	-0.02%	0.19%	0.42%	0.46%	0.41%	0.56%	0.0111	*
Location										
Metropolitan	112	-0.13%	-0.16%	-0.06%	-0.11%	-0.21%	-0.09%	0.02%	0.0075	*
Micropolitan	19	-0.14%	-0.25%	0.11%	0.45%	0.58%	0.60%	0.49%	0.0012	*
Rural	4	-0.13%	-0.02%	0.31%	0.12%	0.12%	0.76%	0.51%	0.0744	

[a] p-value of the mean difference between 2019 and 2013 TPS National Percentile Rank using paired t-test

[b] Only one observation, paired t-test not applicable

** Mean difference (increase) between 2019 and 2013 is significant at 0.05 confidence level*

FIGURES

Figure 1. New York Hospitals' Payment Adjustments and TPS National Percentile Rank, 2013-2019

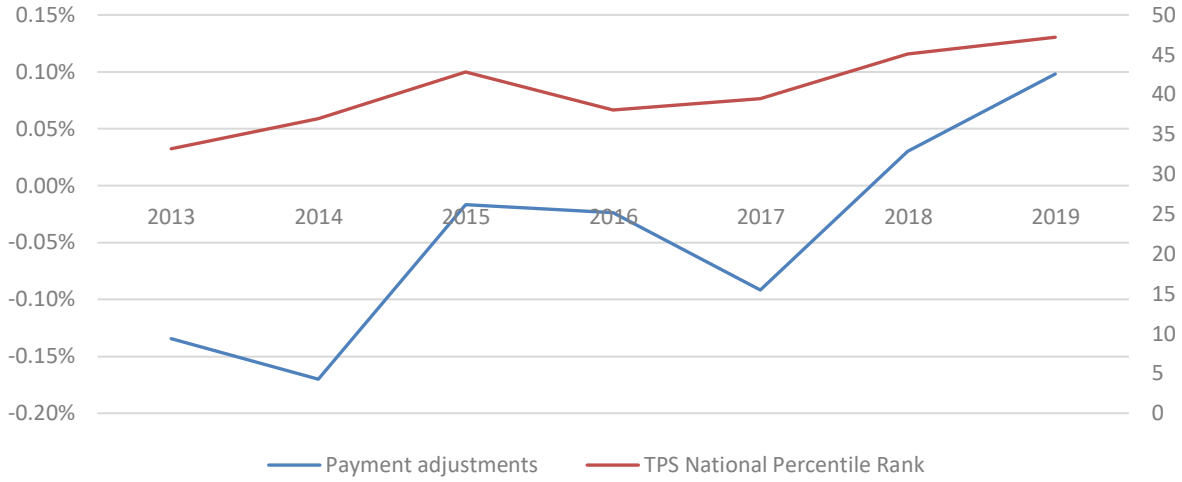


Figure 2. New York Hospitals' Payment Adjustments Per Number of Facility Beds, 2013-2019

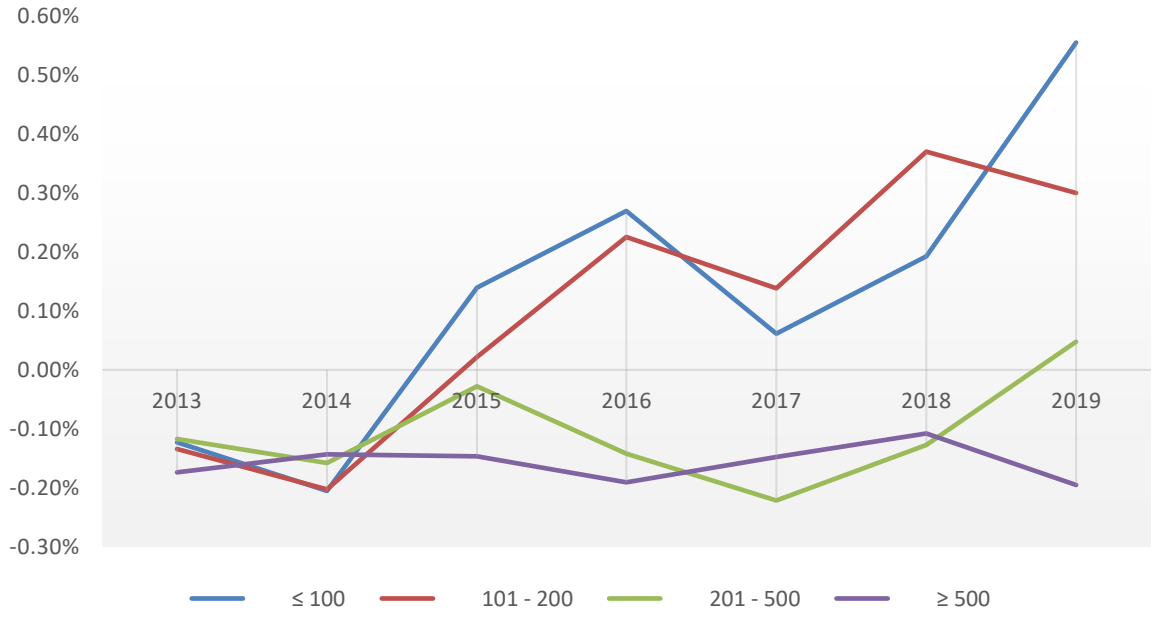


Figure 3. New York Hospitals' Payment Adjustments Per Hospital's Star Rating, 2013-2019

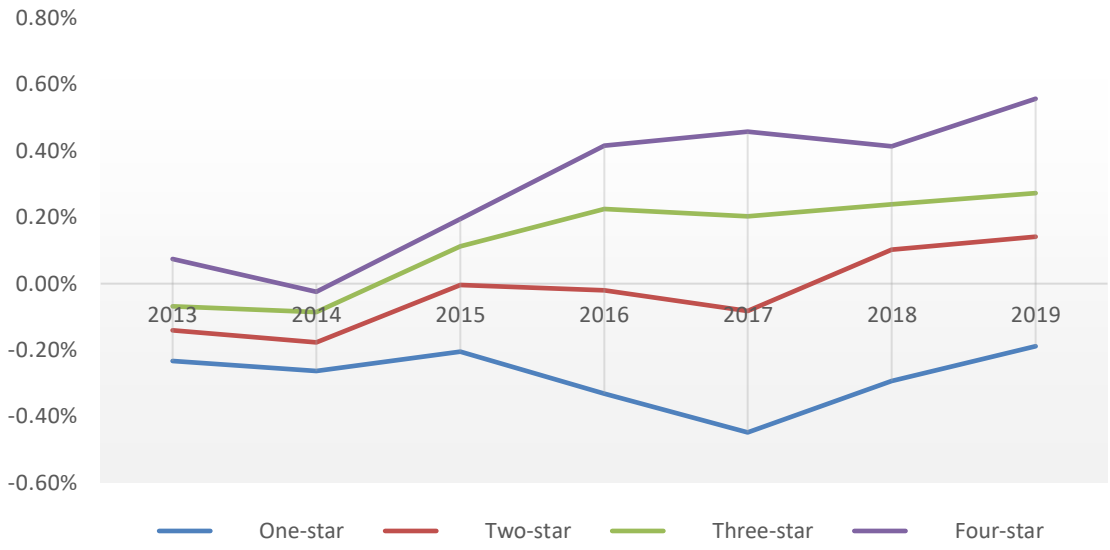


Figure 4. New York Hospitals' Payment Adjustments Per Teaching Status, 2013-2019

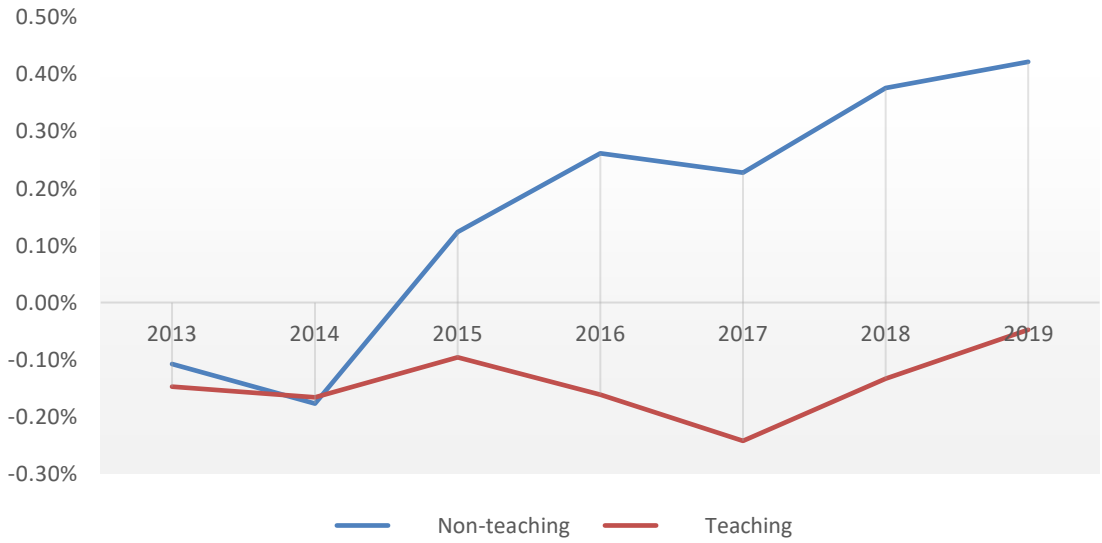
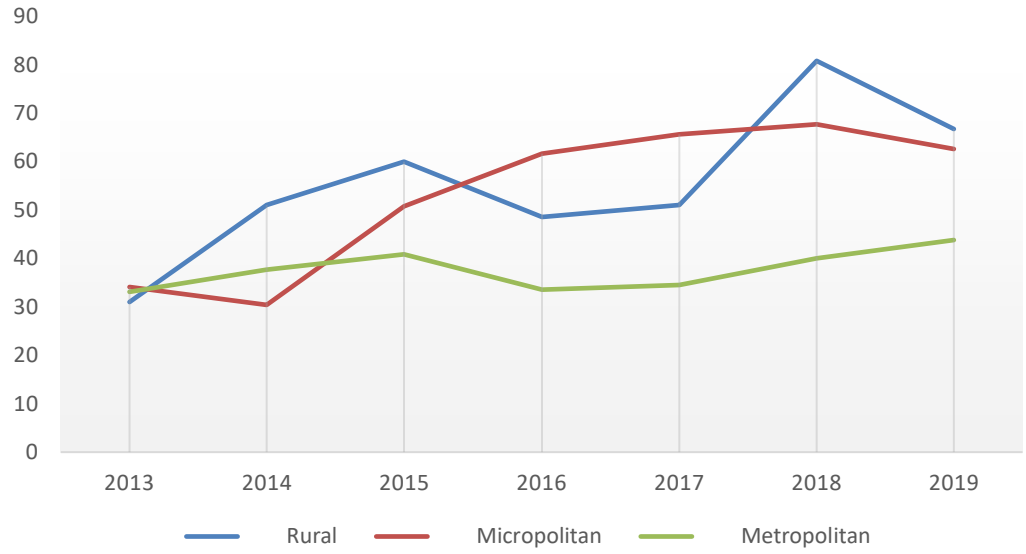


Figure 5. New York Hospitals' Payment Adjustments Per Location, 2013-2019



TELEHEALTH: DO ALTERNATIVE PAYMENT MODELS MATTER?

Mei Zhao, University of North Florida
Hanadi Hamadi, University of North Florida
D. Rob Haley, University of North Florida
Cynthia White-Williams, University of North Florida
Sinyoung Park, University of North Florida,
Jing Xu, University of North Florida

ABSTRACT

The hospital sector has shifted its focus to advanced information and communication technologies (ICT) to facilitate health care delivery via telehealth services to alleviate the industry's most pressing challenges in quality care and access, especially under changing reimbursement payment approaches. The aim of this study is to examine the association between alternative payment models (APMs), market competition, and telehealth provisions in the hospital setting. A secondary cross-sectional design to analyze 2018 census data of non-federal short-term acute care hospitals in the United States was utilized. Multilevel logistic regressions models were used to analyze data from 4,257 hospitals across 1,874 counties. Counties with less than one hospital were excluded. Regarding APMs, we found that hospital participation in accountable care organizations (ACOs) and participation in a bundled payment risk arrangement are significantly associated with the provision of telehealth services. From the market perspective, hospitals located in less competitive market were more likely to provide telehealth services. In addition, other hospital characteristics such as ownership, part of a system, part of a network, and major teaching affiliation also have impact on the provision of telehealth. The increase uptake of telehealth-related capabilities and their strong integration into care-delivery systems under APMs present exciting opportunities to enhance the merit of clinical care. They also present challenges as clinical professionals are not adept to using such technologies. There is a need to provide comprehensive of evidence on telehealth.

INTRODUCTION

Telehealth is a way to provide healthcare services regardless of place, time, or physical barriers.[1] It allows healthcare professionals to provide care and share medical information remotely using advanced technologies to improve a patient's health.[2,3] Telehealth has emerged as an important component of the healthcare system, especially within the hospital setting, since it has shown to significantly impact hospitals in term of access, quality and cost. Particularly, the use of telehealth technologies, tools and services may increase patients' access to care, reduce unnecessary healthcare utilization and moral hazard, and increase hospitals' competitive advantage. [4,5,6]

Telehealth uses advanced information and communication technologies to support clinical care delivery, patient-centered education, public health efforts and administration.[7,8] According to the Department of Health and Human Services (DHHS), over 40% of hospitals utilized telehealth interventions for their employees and patients, as well as telecommunicated with other healthcare professionals and among healthcare professionals and patients.[7] There is an increased sense of urgency to advance evidence-based research for telehealth technology and use as it quickly to expand into multiple health sectors.[9,10]

Background

One sector of the healthcare that has increased its use of telehealth services is the hospital. The hospitals have shifted its focus to advanced information and communication technologies (ICT) to facilitate health care delivery via telehealth services to alleviate the industry's most pressing challenges in quality care and access.[11] Telehealth services are touted to become one of the most promising innovative solutions.[12] Not only have studies

shown that technology can improve patient outcomes, it may also increase hospital efficiency and financial performance especially under changing reimbursement payment approaches.[13]

Competitive advantage

Hospitals may gain significant competitive advantage through ICT applications, yet the United States hospital industry lags behind other healthcare industries in terms of technology adoption and adaptation.[14] According to the Department of Health and Human Services (HHS), only 40 percent of hospitals adopted telehealth interventions as compared to 60 percent for other healthcare organizations, such as private physician practices and home health care.[6,15] For urgent-care centers, telehealth utilization increased by 1,434% from 2008 to 2017.[16] As a result, hospital administrators, leaders, and decision makers should find ways to broaden telehealth adoption across organizations and payment models as a means to improve the quality, access and cost of care. Reports indicated that telehealth adoption among hospitals and health systems has increased over the past 5 years from 54% in 2014 to 85% in 2019.[17]

Almost two-thirds of hospitals, health systems and academic medical centers are using two-way video/webcam technology specifically between physicians and patients in 2019, up from 47% in 2016.[17] In addition, the adoption of population management tools such as short messaging system (SMS) or text messaging system by health systems and hospitals increased from 12% in 2016 to 19% in 2019.[17]

Alternative payment models (APMs)

Hospital alternative payment models (APMs) have developed rapidly over the past several years.[18] Two main alternative payment methods are bundled payments and accountable care organizations (ACOs). Bundling is a payment mechanism whereby a provider entity receives a single payment for services provided across one or parts of the care continuum. For example, an entity might receive a single payment for hospital and physician services provided as part of an inpatient stay or might receive a single payment for the post-acute care services involved in a single episode of care. The entity then has the responsibility for compensating each of the individual providers involved in the episode of care. The ACO is a healthcare organization that links reimbursement to outcomes such as quality care and cost reductions reimbursements to quality metrics and reductions in the cost of care.[19] The ACO is responsible to patients and third-party payers for the appropriateness and quality of care. The goal of the ACO is to promote efficiencies at all levels of patient care. Successes of the ACO are reflected in the cost saving among the provider participants in the program.

Organizations that have integrated their financial structure with their delivery of care using such APMs, cover and often encourage the utilization of ICT to improve care, reduce cost and facilitate better and timely access to care.[19] CMS grants more flexibility for telemedicine services under bundled payment model for joint replacements.[20] However, more information is needed about the association between ACOs, bundled payment models and telehealth adoption. Preliminary evidence suggests that hospitals that participate in an ACO may be more likely to adopt telehealth strategies to accommodate for the increase of patient volume.[19] For example, the results in Kaiser Permanente of Northern California has shown that the APMs increased patient visits within a structure that overall reduces healthcare costs.[21]

Thus, the utilization of ICT in such an environment may be critical to ensure adequate access to care. Therefore, the increased political push and use of bundled payments and ACO provide an opportunity to better understand how organizations are experimenting with telehealth to improve health. In addition, market characteristics also plays a significant role for telehealth adoption. Hospitals located in more competitive areas and received reimbursement for private payers were associated with higher level of hospital telehealth adoption.[4, 22] Therefore, the aim of this study is to examine the association between APMs, market competition, and telehealth provisions in the hospital setting.

METHODOLOGY

We used a secondary cross-sectional design to analyze census data of non-federal short-term acute care hospitals in the United States.

Data Sources

We utilized the 2018 American Hospital Association (AHA) Annual Survey, Area Health Resource File (AHRF), and Dartmouth Atlas Hospital Service Area (HSA) dataset. The HSA dataset provides geocodes for geographic boundaries of hospital service area (n= 3,234). HSA is defined as the collection of ZIP codes where residents receive the largest proportion of their hospitalization from the hospitals in that area. The AHA data collects information on over 6,000 hospitals. The survey contains information specific to hospital characteristics including hospital structure and process. The AHRF collects and stores county-level information across the United States about health care professional, health facilities, hospital utilization and population estimates. The three datasets were all merged using CMS Provider Number and County Federal Information Processing Standards (FIPS).

The data on hospital characteristics that support the findings of this study were obtained from the American Hospital Association. The Area Health Resource File, and Dartmouth Atlas Hospital Referral Region are both publicly available datasets and can be downloaded at https://data.hrsa.gov/topics/health-workforce/ahrf, and https://atlasdata.dartmouth.edu/static/research_data_archive?tab=39, respectively.

Measures

Our dependent variable was hospital use of telehealth services (1=Yes, No=0). We created an overall telehealth dichotomous variable using a series of 6 survey items in the 2018 AHA data. The survey asked hospitals whether they provided consultation and office visits, electronic intensive care unit (eICU), stroke care, psychiatric and addiction treatment, remote patient monitoring post-discharge, or remote patient monitoring ongoing chronic management through telehealth. If hospitals answered yes to providing any of the listed telehealth services, then they provided telehealth services (n=2,351), and if hospitals answered no to all the listed services, then those hospitals did not provide any telehealth services (n=1,906). The independent variables are hospital participating in ACOs (1=Yes, No=0), participating in a bundled payment risk arrangement (1=Yes, No=0), and market competition, measured by the Herfindahl- Hirschman Index (HHI). A hospital HHI is the ratio of total hospital inpatient days by a county's total inpatient days accounting for a hospital's system affiliation. A hospital HHI closer to 1 represents a monopoly while closer to 0 represents a competitive market.

In this study, we also included both hospital and market level control variables. Prior research shows that organization characteristics such as hospital size, system membership, ownership and teaching status are important to understanding the propensity to technology adoption.[4,23] Hospital size (small: 0-99 beds, medium: 100-399 beds, large: 400+ beds) is an accepted factor in predicting organizational capacity.[24] Thus, hospital characteristics that were included in the study based on past research contribution were hospital size (small: 0-99 beds, medium: 100-399 beds, large: 400+ beds), hospital ownership (for-profit, not-for-profit and non-federal government), teaching affiliation (major teaching, minor teaching, and non-teaching), hospital location (rural and urban), critical access hospital, part of a system, part of a network. In addition, hospital payer mix is assessed by considering Medicaid discharges as a percentage of total discharges. Furthermore, we included several market covariates that were identified of importance in prior research. These variables included health professional shortage areas (1=physician or mental health professional shortage county, 0= not a shortage county), per capita income, and population size. These variables will impact the market supply and demand.

Analysis

We summarize our findings using frequency and percentage for categorical variables and means and standard deviations for numeric variables. The analyses were performed using STATA 14 SE. Multilevel logistic

regressions models were used to adjust for county nesting effect. This study analyzed data from 4,257 hospitals across 1874 counties. That is, we have 4257 hospitals (level-1 units) nested in 1874 counties (level-2 units). Counties pertain to a level (rather than a predictor variable), while hospital characteristics such as size, ownership, location pertain to a predictor variable since its categories are both non-random and theoretically meaningful. Therefore, the multilevel logistic regression analysis considers the variations due to hierarchy structure in the data. It allows the simultaneous examination of the effects of group level (county) and individual level variables (hospital) on individual level outcomes while accounting for the non-independence of observations within groups. Also, this analysis allows the examination of both between group and within group variability as well as how group level and individual level variables are related to variability at both levels. All variables were tested for multicollinearity. Akaike's and Schwarz's Bayesian information criteria was used to determine model fit.

RESULTS

Our sample (4,257) is representative of the US hospital population, which includes almost all the nonfederal, short-term general hospitals. Only very few hospitals with missing data were not included in the study.

Descriptive Statistics

Table 1 indicates the percentage of hospitals that provided telehealth in 2018. Among all the community hospitals (4,257) in the United States, 55.23% used telehealth services (n=2,351) in 2017. The most common service provided is stroke care (39.56%), followed by consulting and office visits (37.59%) and psychiatric and addiction treatment (24.43%). Other telehealth services are relatively less prevalent, with remote patient monitoring ongoing chronic care management (18.98%), remote patient monitoring post-discharge (15.03%), and electronic intensive care unit (17.27%).

Insert Table 1

Table 2 displays the bivariate analysis of the independent variables to the dependent variable. The results show that the likelihood of using telehealth services is significantly correlated with the hospital participating in accountable care organizations and participating in a bundled payment risk arrangement. In addition, the analysis indicates that the telehealth provision was significantly related to hospital market competition (HHI). Finally, hospital characteristics such as hospital size, ownership, part of a system, part of a network, teaching affiliation, location, whether is a critical access hospital and market characteristics such as the designated shortage county, and per capita income are all significantly related to the telehealth provision.

Insert Table 2

Multivariate Analysis

Table 3 summarizes the findings from the multilevel logistic regression model. As predicted, participation in ACOs and bundled payment risk arrangements are significantly positively related to hospital telehealth provision. In addition, the higher HHI, meaning the lower market competition, is significantly related to hospital telehealth provision. Regarding other hospital characteristics, the significant impacting factors are hospital ownership, part of a system, part of a network, and being a major teaching hospital. However, no other hospital and market characteristics are significant.

Insert Table 3

Compared to the private non-for-profit hospitals, both the government owned and private for-profit hospitals are less likely to provide telehealth services. Compared to independent hospitals, the system-owned hospitals are more likely to provide telehealth services. Compared to the hospitals that are not in a network, the ones that in a network are more likely to provide telehealth services. Compared to non-teaching hospitals, major teaching hospitals are more likely to provide telehealth services, while minor teaching hospitals are not significant.

The odds ratio estimates with 95% Wald's confidence limits are provided in Table 3 to report the magnitudes of the impact from the predictors. The odds for hospitals that participate in an ACO is 1.84 times more than that of hospitals without participation to offer telehealth services. Similarly, the odds for hospitals that participate in bundled payment program is 2 times more than that of hospitals without participation. In addition, a unit increase from the average HHI leads to a 57% increase in the odds to provide telehealth services. Finally, this study also shows that the odds for major teaching hospitals to provide telehealth services is 2.67 times more than that of non-teaching hospitals. On the other hand, participation in the system and network increase the odds by about 30% and 41%, respectively, while government and for-profit hospitals decrease the odds by 49% and 66% compared with not-for-profit hospitals.

DISCUSSION

This study provides important insight into the association between APMs, market competition, and telehealth provision in the hospital setting. The economic efficiencies of telehealth are supported by recent studies but have not been studied with financial risk models such as ACOs and bundled payments.[25,26] Our research found that hospitals participating in ACOs and those participating in bundled payment programs were more likely to provide telehealth services. These financing models encourage organizations to use specialist resources for patients in an efficient manner.[27] This likely indicates that the economic efficiencies associated with telehealth interventions may be facilitating hospitals participating in higher risk financial models to adopt telehealth. Similar to our findings, a study of 393 ACO hospitals and 810 non-ACO hospitals found that ACO participating hospitals were more likely to adopt health IT.[28] However, some authors suggest that ACO contracts that are driven by cost reductions may not readily adopt new technologies. Nevertheless, the need for cost reductions may incentivize ACOs to eventually adopt telehealth technology as the benefits are noted over time (years) compared to the cost of initial investments.[29]

In addition, our study found that hospital market concentration has a significant effect on hospital telehealth provision. The findings indicate that hospitals located in less competitive markets were more likely to provide telehealth services. While our research is in contrast to a previous study that found hospital competition was not associated with telehealth adoption, it did support other studies that hospitals located in less competitive areas were more likely to adopt telehealth.[3,30,31] Hospitals in less competitive markets are more likely to lack the specialist resources than that of more highly populated and competitive areas. Therefore, less populated and more rural areas would need to rely on telehealth to cost-effectively bring needed services into hard to staff areas.[30] Furthermore, hospitals located in more competitive areas and those that received a greater percentage of reimbursement from private payers were associated with a higher level of hospital telehealth adoption.[4,22]

In addition, other hospital characteristics were found to significantly influence the provision of telehealth. Our research indicates that, compared to private not-for-profit hospitals, both the government and for-profit hospitals were less likely to provide telehealth services. In addition, system-owned hospitals and hospitals in a network were more likely to provide telehealth services. This is supported by Ward and colleagues that studied the U.S. hospitals in the 2013 HIMSS database. Their study results indicated that hospitals that were more likely to have implemented telehealth services were not-for-profit institutions, academic medical centers, hospitals that were part of integrated delivery systems.[23,28] Furthermore, another study revealed that large system-affiliated, not-for-profit, and teaching hospitals have a greater propensity to adopt telehealth programs.[23] Not-for-profit hospitals were able to use excess income to fund patient benefits and hospitals that were system affiliated had greater access to shared information and coordination of resources, as well as the ability to share risk and costs.[23]

Similarly, Adler-Milstein and colleagues researched 2,891 acute care U.S. hospitals using the Information Technology (IT) Supplement to the American Hospital Association (AHA) 2012 Annual Survey of Hospitals and found that hospitals that had greater technological capabilities were more likely to have adopted some type of telehealth.[4] These were typically hospitals that were part of larger hospital systems and teaching hospitals.[4] They also found that hospitals in large rural areas had a higher likelihood to be associated with telehealth adoption. In support, according to Huilgol, Miron-Shatz, Joshi, & Hollander (2019), hospitals located in rural, less populated areas, with lower number of employees, and utilizing technology integrating into electronic health record adopted telehealth more than counterparts in California.[31] Other studies found that hospitals located in remote and isolated regions were less likely to employ telehealth services.[3,32]

Policy and Practice Implications

This study provides important insights into the association between APMs, market competition and telehealth provisions in the hospital setting. By examining both hospital and market characteristics that determine hospital telehealth adoption using the latest national level data, this study provided a framework to incentivize payment models and promulgate policies to promote quality care using the latest technological advancements. Therefore, the findings from this study provide a more updated and systematic consideration for hospital telehealth adoption. Hospital administrators and policymakers need to better understand the financial efficiencies of telehealth services and the provision of health care. The recent changes in legislation will revise reimbursement and, therefore, impact hospitals adoption of telehealth services. Both the Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009 and the Patient Accountability and Affordable Care Act (ACA) of 2010 supported the expansion of and innovation in telehealth technologies. The ACA supported telehealth in the context of ACOs which focused on attempting to foster evidence-based high quality and coordinated care and cost saving (42 U.S.C. x 1395jjj). The Medicare Access and CHIP Reauthorization Act (MACRA) of 2015 has accelerated the shift from traditional fee-for-service payment model to merit and value-based payment scheme (Public Law No. 114-10), which has created the need to improve the approach used to deliver care. As our results support that value-based care as well as the expansion of APMs such as bundled payment and ACOs can facilitate the adoption of telehealth services. Telehealth services appears to be a cost-effective method to provide some aspects of care. Therefore, policy makers should understand how the various payment methodologies can impact the growth and dissemination of healthcare telehealth technologies and innovations.

Our research also found that for-profit hospitals were less likely to provide telehealth services than not-for-profit hospitals. Policy makers should understand why and develop policies that encourage all hospitals and health systems to use more cost-efficient, yet effective, methods of providing healthcare services. For example, policies that encourage hospital administrators to develop key performance indicators for telehealth services should be considered to lower the cost of care. Given that the U.S. health care system will continue to evolve toward improved quality and efficiency, hospitals and health systems must have the analytic capabilities to track and report how each of their telehealth services is performing. Key performance indicators for telehealth services should be developed and measured. These key performance indicators may include telehealth utilization, diagnoses accuracy, patient experience and satisfaction, physician experience and clinical outcome measures. This can improve efforts to better reimburse for telehealth services, as several legislative proposals have attempted to expand payment but are typically viewed by economists and budget experts as cost increasing if not implemented and utilized well.

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Table 1: Percentage of hospitals that provided telehealth in 2017

	Hospital Provision of Telehealth Services (N=4257)			
	No	(%)	Yes	(%)
Telehealth Services	1906	44.77	2351	55.23
Consultation and office visits	2657	62.41	1600	37.59
eICU	3522	82.73	735	17.27
Stroke care	2573	60.44	1684	39.56
Psychiatric and addiction treatment	3217	75.57	1040	24.43
Remote patient monitoring post-discharge	3617	84.97	640	15.03
Remote patient monitoring ongoing chronic care management	3449	81.02	808	18.98

Table 2: Descriptive Statistics of Telehealth Services Based on Hospital Characteristics

		Hospital Provision of Telehealth Services				
	N	No		Yes		P-value
Categorical Variables		*f*	*%*	*f*	*%*	
Accountable Care Organizations	3110					
Yes		248	17.58	1163	82.42	
No		633	37.26	1066	62.74	
Bundled Payment	3072					0.000
Yes		61	11.13	487	88.87	
No		810	32.09	1714	67.91	
Size	4257					0.000
Large		107	23.67	345	76.33	
Medium		685	40.82	993	59.18	
Small		1114	52.37	1013	47.63	
Ownership	4257					0.000
Non-For-Profit		880	33.41	1754	66.59	
For-Profit		462	73.57	166	26.43	
Government		564	56.68	431	43.32	
System	4257					0.000
Yes		1108	39.26	1714	60.74	
No		798	55.61	637	44.39	
Network	3321					0.000
Yes		339	21.37	1247	78.63	
No		631	36.37	1104	63.63	
Teaching Status	4257					0.000
Major		26	11.35	203	88.65	
Minor		575	38.31	926	61.69	
Non		1305	51.64	1222	48.36	
Location	4257					0.000

Rural		932	52.13	856	47.87	
Urban		974	39.45	1495	60.55	
Critical Care Access Hospital	4257					0.000
Yes		687	53.34	601	46.66	
No		1219	41.06	1750	58.94	
Designated Shortage County	4257					0.016
Yes		1860	45.1	2264	54.9	
No		46	34.59	87	65.41	

Continuous Variables	*N*	**mean**	**SD**	**Mean**	**SD**	P-value
HHI	4257	0.759172991	0.36	0.723650575	0.37	0.002
Medicaid Percentage of Inpatient Days	4257	19.66423439	14.32	20.11883425	14/49	0.306
Per Capita Income	4258	43210.08817	11457.13	46659.22782	14836.62	0
County Population	4254	637955.1802	1672462	633519.2118	1444185	0.926

Table 3: Multilevel Analysis of Telehealth services, Hospital Characteristics and Community Characteristics

	Odds Ratio	SD	[95% Conf.	P>z
Part of an ACO (Reference: No)	1.84	0.21	[1.47,2.30]	0
Bundled Payment (Reference: No)	2.12	0.38	[1.49,3.00]	0
HHI	1.57	0.27	[1.12,2.21]	0.009
Hospital Size (Reference: Small)				
Medium	1.33	0.19	[1.00,1.77]	0.052
Large	1.50	0.36	[0.94,2.40]	0.093
Ownership Status (Reference: Not-for-Profit)				
Government	0.51	0.06	[0.40,0.66]	0
For Profit	0.34	0.06	[0.24,0.48]	0
Part of a system (Reference: No)	1.30	0.15	[1.03,1.64]	0.027
Part of a Network (Reference: No)	1.41	0.15	[1.15,1.75]	0.001
Teaching Affiliation (Reference: Non-teaching)				
Minor	0.95	0.12	[0.74,1.23]	0.72
Major	2.67	0.89	[1.40,5.12]	0.003
Rural Location (Reference: Urban)	0.88	0.12	[0.67,1.16]	0.361
Critical Access Hospital (Reference: No)	0.79	0.11	[0.60,1.03]	0.082
Designated Shortage County (Reference: No)	0.81	0.27	[0.41,1.58]	0.537
Medicaid Percentage of Inpatient Days	1.00	0.003	[0.99,1.01]	0.954
Per Capita Income	1.00	5.16E-06	[1.00,1.00]	0.079
Population Size	0.99	7.86E-08	[1.00,1.00]	0.167
AIC		3269.83		
BIC		3384.3		

POLICY AND PERFORMANCE: THE SEARCH FOR IMPROVED EFFICIENCIES FOR CHRONIC DISEASE FUNDING AND ALLOCATION

Cassandra R. Henson, Townson University

ABSTRACT

Chronic diseases and associated treatments are the primary drivers of the U.S. national health expenditure. Approximately 60% of all Americans have at least one chronic disease, and approximately 42% are reported to have multiple chronic conditions. (CDC/NCCDPHP 2018; Buttorff et al, 2017). Of the nation's $3.3T healthcare expenditure, 86% or $2.84T was spent on chronic diseases across all payers (Gerteis et al, 2014; CDC). Chronic diseases, while often incurable and requiring long-term treatment, are often preventable with routine medical care and screening for early detection. These costly illnesses include heart disease, cancer, diabetes, hypertension, obesity, arthritis, Alzheimer's and chronic kidney disease.

As healthcare expenditures continue to grow in response to realizing the triple aim (access to care, quality of care, costs of care), we must work to improve our chronic disease allocation methodologies, with the goal of maximizing positive health outcomes (and overall system performance). The business sector has been quite successful at right-sizing its networks and aligning its resource allocation strategies, creating improved efficiencies and ultimately improved performance. Should we look to business for establishing a revised model of resource allocation for chronic diseases?

The purpose of this research is to examine the often unclear sector boundaries, the commonalities between healthcare and business and the possible policy implications of shared best practices. To establish the linkages/commonalities between the business and healthcare sectors, we'll first outline the standard policy analysis process of each to include problem identification and definition (which often drastically varies by industry in approach and focus). Then, policy implementation methods will be explored/compared using Van Meter and Van Horn's policy and performance theory (1975) (later reframed and expanded) as the foundational framework. Applying the framework to the current healthcare policy and expenditure challenge of chronic diseases, funding will then be compared to reported outcomes and results, to gauge efficiency and performance or process.
The overarching objective of this research is to share resiliency tools necessary for facilitating successful policy implementation and resource allocation. This conference session is expected to engage the audience in a deep discussion that will achieve the following three objectives:

- Learning Objective 1: Examine the sector-specific barriers to policy implementation. This examination will facilitate the foundation participants will need to understand the challenges both industries face: Why do these barriers exist and what are their specific impacts on the policy implementation process.

- Learning Objective 2: Examine the sector-specific policy implementation, resource availability and allocation methodologies. Van Meter and Horn as well as other key theorists will be discussed. Here, we will examine the current strategies/best practices used in both industries: what's working and what isn't?

- Learning Objective 3: Examine business sector best practices and possible application to healthcare and rising chronic disease expenditure. This interactive portion of the session will involve round table audience discussion of core competencies (skills), establishing collaborative networks, communicating across disciplines, navigating sector cultures, and performance measurement and management.

DON'T CASH THAT CHECK! IDENTIFYING RISKS TO MEDICAL BILLING AND COLLECTION PRACTICES UNDER THE DOCTRINE OF ACCORD & SATISFACTION

William "Kent" Willis, Marshall University
Casey W. Baker, Marshall University
Charles Stivason, Marshall University

ABSTRACT

Medical billing practices—especially non-disclosure and balance billing— have been the subject of controversy in recent years, prompting calls for additional regulation. But the existing commercial law doctrine of accord and satisfaction, which is well established in forty-nine states, presents a risk to the collection practices of hospitals and other health care-related businesses that has, thus far, been ignored by existing scholarship.

This article examines the doctrine of accord and satisfaction in the context of common hospital billing and collection practices, identifying key aspects of the doctrine for health care administrators to consider. The authors conclude with recommendations to health care organizations for structuring payment processing systems to reduce the risk that medical bills will be legally uncollectable.

TRACK

GLOBAL HEALTHCARE

HOW THE U.S. HEALTH SERVICES INDUSTRY IS (FINALLY) GLOBALIZING

Blair Gifford, University of Colorado Denver

ABSTRACT

In comparison to industrial sectors which are relatively mature in their globalization evolution, there have been unique forces that have held the globalization of health services back and anchored them in national systems of healthcare delivery and consumption. Accordingly, health services globalization has typically been portrayed merely as a side show as trivialized by the term "medical tourism." However, as described in this paper, the globalization of U.S. health services is no longer limited to medical tourism. There are additional forces at play that have led to globalization efforts of all elements of the health services industries. These factors include: 1) Market expansion, 2) International Branding, and 3) Needed Help by Host Nations. The consequences of these additional factors have led to the early stages of a globalized health services industry. This change in orientation will have a profound impact on the industry as health services competition will not just be local or regional, but also national and international.

INTRODUCTION

In comparison to industrial sectors which are relatively mature in their globalization evolution, there have been unique forces that have held the globalization of health services back and anchored them in national systems of healthcare delivery and consumption. Accordingly, health services globalization has typically been portrayed merely as a side show as trivialized by the term "medical tourism." However, as described in this paper, the globalization of U.S. health services is no longer limited to medical tourism. There are additional forces at play that have led to much momentum and globalization efforts of all elements of the health services industries. The consequences of these changes will have a profound impact on the industry as health services competition and brand identification will not just be local or regional, but also national and international.

A uniquely domestic orientation

The healthcare industry is distinctive in numerous ways. For one, there is a unique structural issue. Consumers – patients with symptoms – are typically ignorant about the cause of their symptoms and the required treatment for relieving them. The suppliers – healthcare professionals, in affiliation with health services organizations – are typically not paid by the consumers (in the developed world). Rather, market transactions involve one and often more intermediaries who administer the payment. Additionally, the health services industry stands out in terms of the demand for its output. Given the complex structure of the industry, identifying the actual source of demand is a challenge as it includes the patient, the doctor who prescribes the treatment and the payer for the services (i.e., insurer). Demand is often inelastic and is prone to information asymmetries of numerous kinds that influence the transactions and place much power in the hands of the intermediaries who pay for the services (1).

Furthermore, and in-contrast to most other industries, in healthcare the goal is not necessarily profit-maximization, but quality care. As an industry whose value creation lies in extending lives and enhancing their quality, there is a strong moral dimension attached to value creation, producing a delicate balance between this imperative and the different and often conflicting demands of economic performance and survival. Notwithstanding notable successes in combining value creation and financial goals, these goals often conflict with each other and impose tradeoffs (2).

The above distinctive aspects of the healthcare industry and others assume additional complexity as the industry globalizes. The ambiguity of the ultimate goal of healthcare, along with the subsequent difficulty of devising corresponding performance measures (e.g., financial indicators, quality of care, outcome of treatment, etc.) are magnified by country-specific philosophies of life and mortality and varying perceptions regarding universal access to health care. These philosophical and cultural differences bring about varying views as to should be responsible for healthcare provision and who should pay for it. Country differences also express themselves in the nature of demand. Varying perceptions of healthcare versus healing by forces of faith and religion, coupled with different views of modern versus traditional medicine, often determine the level of demand for health services and its nature. Also, education levels influence information asymmetries between participants in the complicated transactions that define the industry. Lastly, differences in the style, diet, and other ongoing activities affect the types of diseases prevalent across countries and their frequency (3).

International consumerism of health: medical tourism

The healthcare industry has not been totally left behind in the globalization trend of other industries. Most point to medical tourism as the primary example of the globalization of healthcare. Medical tourism is the process of traveling to a distant location to obtain medical care. The practice of medical tourism is growing and evolving. It is estimated that over 2 million patients travel to over 35 destination nations today for an estimated $40 to $75billion worth of economic activity. Medical tourism's growth reflects the outcome of an increasingly global and privatized healthcare marketplace for service delivery (4).

While all services, not just health, account for only one-fifth of global trade, they have been the fastest growing component of international trade since the 1980s. This increase is best understood when one considers the spread of neoliberal economic policies for services including: privatization of healthcare, state subsidies to private-sector providers and reduced restrictions on foreign direct investment. Neoliberal economic policies were enhanced with the introduction of the General Agreement on Trade in Services (1997) for member nations in the World Trade Organization. GATS identifies four modes of service delivery in international trade, including: 1) cross-border supply of services through technological means, 2) consumption of healthcare services abroad, 3) establishment of commercial activity in a foreign country, and 4) temporary movement of healthcare professionals to deliver services across borders (Burns).

Although enhanced travel and trade policies have been critical to the growth of medical tourism, one should be aware that medical tourism's growth is a product of changes in consumerism. That is, consumers, via the internet and other means, are generally becoming more adept at searching for value in health services. Health consumers typically look for a balance of price, quality, and service and health service firms compete with one another in terms of how they address this value proposition (5). For example, an increasing number of people are traveling across state lines in the U.S. to obtain care at centers of excellence such as MD Anderson, Mayo Clinic, and the Cleveland Clinic.

In addition, medical cost inflation in the U.S. has led both private payers (e.g., employers) and public payers (e.g., Medicare) to require their enrollees to assume more of the cost burden via higher deductibles and higher co-pays. This situation has heightened consumer sensitivity to the price dimension and this is not just happening in the U.S., but in all nations. That is, health cost inflation is a problem everywhere and it has led many consumers to seek lower cost care internationally. The cost of building and maintaining high-quality patient care centers internationally is substantially lower than in the U.S. This is in large part due to lower labor costs, lack of unions, less pervasive and expensive technologies utilized, and lower-cost raw materials used in construction. For example, a new nursing graduate in a medical tourism hospital India generally earns $3,600 to $4,200 a year; a nurse specialist in the ICU, with 6 to 8 years experience, earn around $15,000. In both case, the salaries are 10 to 20 percent of the U.S. rate (4).

To ensure quality and service, many hospitals seek international accreditation. For example, many international hospitals have undergone a stringent accreditation process by the Joint Commission International. JCI is an affiliate of the Joint Commission on Accreditation of Healthcare Organizations, which accredits and certifies healthcare organizations and programs in the U.S. By 2016, more than 600 hospitals worldwide were accredited by JCI, a number that has been growing by about 20% annually (6).

In addition to JCI and other internationally recognized accreditation sources, many international providers seek to demonstrate quality through partnerships with top medical academic centers. The University of Pittsburgh Medical Center (UPMC) partners with four hospitals in China; Harvard University and Mayo Clinic partner with University Hospital in Dubai's Healthcare City; and, Johns Hopkins Medicine International partners with the Apollo Group Hospitals in India. These partnering institutions typically share best practices and rotate faculty between their facilities.

Other Aspects of Health Internationalization

Other major providers of healthcare, notably healthcare professionals, pharmaceutical and med-tech companies and others have vastly broadened their global reach in recent years. The pharmaceutical industry, in particular, has long been global. The cost of drug development that gives rise to vast scale economies, coupled with short spans of patent protection, have pushed pharmaceutical companies to expand the market for their drugs across the globe.

The movement of healthcare professionals, predominantly from emerging markets to developed countries, is not new, but its magnitude has grown considerably, fostered by a liberalization of immigration policies for healthcare professionals. Today, twenty-five percent of doctors in the U.S. are foreign medical graduates and fifty percent of these are Indian. Foreign nurses in the U.S. typically have come from the Philippines, but more recently, their national origins have widened considerably. Also, there is the precedent setting case of Cuba and its proliferation of medical education. The Cuban government exports local doctors to nations in need of health providers and, in return, receives payments for their services (7).

Beyond Medical Tourism: Four Ways that Health Services are Globalizing

In recent years, the services offered have expanded to the point that medical tourism doesn't fully represent the overall globalization in health services that is happening. Leading hospitals in emerging markets – such as the Parkway Group out of Singapore and the Apollo Group out of India – are rapidly expanding internationally. India's Apollos Hospitals Group, the largest private hospital group in Asia, operates 55 hospitals with 9,215 beds and has facilities in India, Sri Lanka, Bangladesh, Ghana, Nigeria, Mauritius, Qatar, Oman, and Kuwait. Only regulations have prevented Apollo from entering the U.S. Likewise, Parkway Hospitals has hospitals in eight Asian and Middle Eastern nations.

In response, some of the most prestigious U.S. hospitals, among them Johns Hopkins, Cleveland Clinic, Harvard, Duke, and UPMC, have formed partnerships that offer combined treatments in the U.S. and overseas. Also, Colorado-based DaVita Corporation has recently entered markets outside the U.S., and now has kidney dialysis centers in thirteen nations. Similarly, Canadian hospitals such as SickKids Children's Hospital have begun to expand internationally (8).

Likewise, consumerism is growing and becoming more demanding of state-of-the-health care and more willing to pay for it. For example, research has shown that there is a 71% lower risk of dying and a 65% lower risk of complications at five star hospitals in comparison to one star hospitals in the U.S. (HealthGrades). Costs for procedures at international hospitals in India are often only 10% of the costs charged at U.S. hospitals. Health consumerism isn't limited to people from developed nations. In 2017, 13,000 medical visas were given out to

Nigerians seeking health care in India (4). Chinese citizens took an estimated 500,000 outbound medical trips in 2016, which is a five hundred percent increase from 2015 (10).
As illustrated in Table 1, medical tourism is not the only driving force behind globalization of health services today. The other forces include a) New profit markets, b) International Branding of Health Systems, and c) Help Needed by Host Nations.

Table 1: Aspects of Health Services of Globalization

New Markets – Profit margins in established markets like the U.S. are tight (2 or 3%). Greater profit opportunities exist or will develop in many international markets with more discerning health consumers. (11, 12)	**Medical Tourism** – Develop an international destination hospital. It's good for the local economy (tourism) and lessens the loss of physicians to other nations (brain drain). (13)
International Branding of Health Systems – A need to enter the emerging international market place that has developed to protect standards in international partnerships and gain reputation as a global player. A response to the Apollo Group and Parkway. (8)	**Help Needed by Host Nation** – An international government needs outside assistance to handle growing demands in patient care and to enhance state of the art of care in country. For example, oncology care in China. (14)

Supply is driving the left cells of the table. There are growing opportunities for health services organizations to gain profits internationally and develop market share internationally. Demand is driving the right cells of the table. That is, consumers are seeking out international hospitals for lower price, high quality care and consumers are demanding that their governments provide better quality care than is currently provided. Additionally, profit is driving the top two cells of the table, new markets and medical tourism are profit driven. Alternatively, status and service are driving the bottom two cells of the table. Health systems are trying to enhance their reputations locally through international efforts.

Help Needed: The Case of Oncology Care in China.

Cancer has recently become an epidemic in China. It is the leading cause of death (i.e., 374.1 per 100,000 person years), and the incidence of cancer is three times higher in China than in India (15). In 2015, there were 4.3 million new cancer cases and more than 2.8 million cancer deaths in China. The most recent data show that 13% of deaths in China were caused by malignant neoplasm. Every minute six people in China are diagnosed with Cancer, and about 12,000 new cancer diagnoses are made every day (14).

Like many nations, China is trying to catch up with leading cancer treatments and facility capacity, and they are trying to keep their cancer patients and oncologists in the nation (16). It is estimated that China has only about one quarter of the physical capacity and health provider capacity to manage cancer care (17). Accordingly, the Chinese government has changed policies in the last couple years in an effort to draw in international oncology expertise (18).

In particular, the government has been very welcoming to American medical centers to gain and learn from their expertise in oncology care. MD Anderson Cancer Center (U. of Texas) ventured into China a few years ago. At an event attended by the Chinese President (Xi Jinping), Premier (Li Keqiang) and Vice Premier (Liu Yandong) in early 2015, MD Anderson received the top Chinese science and technology award for it partnership programs with Chinese institutions for training, education and patient care. Collaborations have been particularly productive in cancer screening, liver and lung cancer treatment, and cooperation in clinical trials. Sister institutions in China that are working with MD Anderson include the Chinese Academy of Medical Sciences Cancer Institute and Hospital (Bejing), Tianjin Medical University Cancer Institute and Hospital, Fudan University Shanghai Cancer Center, and Sir YK Pao Centre for Cancer at the Chinese University of Hong Kong.

In addition, IBM recently announced that they are making Watson available to 21 Chinese hospitals so that physicians can "personalize cancer care." IBM will be partnering with Hangzhou Cognitive Care on this development. IBM's cognitive computing platform for oncology care was developed in conjunction with Memorial Sloan Kettering physicians. The partnership between IBM and Hangzhou Cognitive Care is an attempt to help Chinese oncologists get up to date about best practices in cancer treatment.

CONCLUSION

As the home of some of the world's most prestigious hospitals and healthcare professionals, U.S. health services institutions and professionals are well-positioned to benefit from the globalization of the health services industry. Global developments, such as GATS and the internet, have made it possible to scale the reputation of hospitals and professionals globally and exploit them on a global scale. Much of the expansion of prestigious U.S. health systems - like MD Anderson, Johns Hopkins International, UPMC, Cleveland Clinic, and DaVita - is driven not just by opportunity but by the need to keep up with the developing international reputation of other top international providers like the Apollo Group out of India. As such, reputations, profits and new ideas for top U.S. health services institutions will increasingly come from activities on the global stage. These new spheres of activity will lead to innovation and radical changes of the health services industry while health consumerism will increasingly flow in many directions.

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TRACK

HEALTH AND WELLNESS

IMPACT OF COST IN DELAY/DEFERRAL OF CARE: A SYSTEMATIC LITERATURE REVIEW

Crissy Flake, Northcentral University
Robert Clegg, Northcentral University

ABSTRACT

Growing numbers of people in the United States are delaying or deferring medical care secondary to the cost burden. Those impacted by cost are not just low-income or uninsured persons. Individuals from higher economic ranges and those with private insurance are also affected. Consequences of the rising healthcare costs are individuals delaying or deferring care, testing, and therapies. As patients postpone or omit care, their conditions continue to decline, resulting in needs for additional medical care than initially anticipated. The greater level of care results in more significant healthcare spending and perpetuating the cycle of noncompliance due to healthcare costs.

INTRODUCTION

Walter Cronkite famously said, "America's healthcare system is neither healthy, caring, or a system" (Cronkite, n.d., para. 1). Exemplification of this fact is the $3.5 trillion spent on U.S. healthcare in 2017, and yet the U.S. healthcare system is ranked near the bottom of 36 nations by the Organisation for Economic Cooperation and Development (OECD). As healthcare costs have continued to rise, concerned patients report the fear a significant medical condition will lead to bankruptcy. U.S. families have borrowed nearly $88 billion over the last year to pay for healthcare (West Health - Gallup, 2019). Studies indicate 1 in 4 adults in the U.S. have reported difficulty in paying medical bills in the last 12 months.

In addition, one-fourth of adults currently taking prescription medications indicate difficulty in affording the cost of their prescription medications. The result is nearly 30% of adults omitted taking some medication as prescribed (Kirzinger, Munana, Wu, & Brodie, 2019). Further, 43% of low-income adults and 33% of all U.S. adults did not seek medical care or fill a prescription due to cost (The Commonwealth Fund, 2016). The impact of delaying or deferring medical care affects both patients and healthcare systems and has far-reaching implications.

Background

In 1994, Dr. William Kissick released his seminal work, "Medicine's Dilemma: Infinite Needs Versus Finite Resources," which introduced the concept of the Iron Triangle of Health Care. The Iron Triangle delineates the idea of improving access to care, improving the quality of care, and decreasing the cost of care. All three concepts are all intertwined and result in being competing interests. Further, the Iron Triangle demonstrates that the U.S. healthcare system frequently can meet two of the three legs, but often fails to achieve all three goals (Kissick, 1994). Dr. Kissick's concept of the Iron Triangle has been the basis of a large body of research in methods to maximize each leg of the Iron Triangle, plans to leverage the Iron Triangle, and the development of the Triple Aim. The Triple Aim - a framework developed by the Institute for Healthcare Improvement - looks at ways to optimize the performance of the healthcare system. The Triple Aim views healthcare through the lens of population health, the experience of health, and the per capita costs to pursue all three legs at once (Faerber, 2017).

The significance of delayed and deferred care is worrisome when applied to any patient. The effect is amplified among patients who have chronic or high-value conditions such as diabetes and cancer. Additionally, when patients defer healthcare, the long-term expense to the healthcare system escalates. The lost opportunity for preventative care or less costly interventions give way to high-cost medications and procedures as patients are sicker

and perhaps in a healthcare crisis. Each of these components adds to the overall cost and ineffectiveness of the U.S. healthcare system.

Despite the body of work related to the Triple Aim and the Iron Triangle, there is relatively little information about how the impact of cost factors into the short-term decisions of individuals as well as long-term consequences to the healthcare system. As the cost factor becomes a more substantial consideration in patients' determination of whether to pursue care, the consequences to patient health and financial risks are not limited to patients. The consequences of rising healthcare costs of delayed or deferred healthcare have downstream considerations for healthcare systems as well.

METHODOLOGY

The study design used in this paper was a systematic literature search of published articles that focus on the impact of cost on patients delaying or deferring care, as well as the impact of patients delaying or deferring care on the healthcare system. Only peer-reviewed articles from trusted websites were used to accomplish the maximum level of integrity. Utilized search engines were Google Scholar, Northcentral University Roadrunner, and ResearchGate. Keywords used to select the scholarly articles include: "financial impact to patient delay of care/treatment," "cost of care," "delayed care," "deferred care" "patient care cost impact," "healthcare cost delayed patient treatment," and "deferred healthcare due to cost." Initially, identified items to be included in the literature review numbered 73. A limitation related to the date of publication was instituted to assist in the timeliness of the data. To this, all articles published between 2010 and 2019 were eligible to be considered for additional review. After reviewing each of the possible choices, the focus was narrowed down to 11 articles. Since this paper involves a systematic review that did not include human subjects, nor did not require any access to identifiable private information, it did not require Institutional Review Board (IRB) approval.

RESULTS

Between 2003 and 2007, the rate of those delaying or deferred necessary medical care in the United States rose from 1 in 7 to 1 in 5, respectively. Causes for the increasing rate of delaying or deferring medical care are thought to be related to the cost of coinsurance and copayments combined with societal, economic factors. Following the concept of Maslow's Hierarchy of Needs, individuals are more likely to spend their funds on housing and food (physiological needs) over healthcare (safety and security) when forced to choose. Persons from lower educational or economic groups are more likely to delay or defer medical care due to cost. Still, the pressure of rising healthcare costs impacts all socioeconomic groups. Ultimately, individuals who postponed or deferred medical care were more likely to report a decline in their health status and quality of life when compared to those who sought and received attention on a timely basis (Chen, Rizzo, & Rodriguez, 2011).

Another facet driving the cost of healthcare in the United States is related to drug therapies. While hospital and physician fees have risen by 69% since 2000, drug therapy expenses have increased by 89%. The increased spending on drug therapies is associated with the cost of biotech and specialty drug therapies, as well as the increasingly pervasive use of drug therapies for a myriad of chronic diagnoses. Attempts to reign in the drug therapy expenses have included restrictive formularies, the mandatory substitution of generic medications for name-brand drugs, and increasing the patient cost share or coinsurance. The vast majority of studies reviewing the correlation between cost-share and adherence found when the patient cost share rises, the adherence to medication regimes decreases. Further, reduced adherence is likely to result in adversely impact outcomes. The additional cost of increased resource utilization is another factor to consider in the overall price tag of medication non-adherence (Eaddy, Cook, O'Day, Burch, & Cantrell, 2012).

The proliferation of high-deductible healthcare plans (HDHPs) is an additional factor impacting whether individuals delay or defer necessary healthcare treatment. Families with chronic healthcare conditions who also had an HDHP were more likely to delay or defer medical care when compared to families with chronic healthcare

conditions who used traditional healthcare products with lower annual deductibles. The burden of the HDHP cost is not limited to low-income families. The probability of delaying or deferring medical care is 40% for families with an income under 400% of the federal poverty level (FPL) and 16% for families with an income over 400% of the FPL. While families with a traditional healthcare insurance plan with incomes below 400% of the FPL delay or defer care is 15.1%, the rate is 4.8% for families with incomes over 400% of the FPL (Galbraith et al., 2012).

Patients with diabetes delaying care due to cost

There are about 30 million patients with a diagnosis of diabetes in the United States (Kang, Lobo, Kim, & Sohn, 2018). Many patients with diabetes face increasing cost-share through several factors, including pharmacy costs, HDHPs, and other out of pocket (OOP) expenses such as copayments and coinsurance. In the 2013 National Health Survey, 50% of all diabetic patients reported some level of perceived financial stress, and 20% specifying economic and food insecurity. Further, those identified as diabetic reported non-adherence due to cost twice as often as respondents without diabetes (Patel, Piette, Resnicow, Kowalski-Dobson, & Heisler, 2016). The prevalence of cost-related pharmacology noncompliance is 1.24 times higher for those using insulin as part of their treatment regime (Kang et al., 2018). In a study of diabetic patients who moved to an HDHP, findings showed that patients often delayed seeking care for initial outpatient complication visits. Additionally, the same patients were noted to have resulting increases in complications being treated in the emergency department (Wharam et al., 2017).

Patients with cancer delaying care due to cost

The use and availability of oral chemotherapy agents have become more prevalent. Currently, about 25% of chemotherapy agents are deliverable through oral routes. Like the traditional treatment modalities, adherence to the treatment regime is paramount (Kav, 2017). However, OOP expenses are likely to create a complication with medication compliance. In a 2017 study, OOP expenses were a common factor in compliance rates. Patients with prescription OOP expenses of $10 or less delayed the purchase of their medication, only 10% of the time. Patients with OOP expenses of $100–$500 were likely to delay oral agents 33% of the time, while those with OOP expenses exceeding $2,000 delayed oral agents 50% of the time (Doshi, Li, Pettit, & Armstrong, 2018). Patients facing rising cost burden may seek methods of adapting and absorbing the expenses. Some patients delay office visits, become non-compliant with therapeutic regimes, or avoiding tests, even though their actions may result in adverse clinical outcomes and higher death rates (Nipp et al., 2016).

Cost burden of medical noncompliance

The growing costs of medical care affect the decisions patients make regarding whether to obtain care, fill a prescription, or pursue additional treatments recommended by a healthcare clinician. One-fourth of patients indicate routine healthcare costs, such as premiums and deductibles, create a financial challenge. Further, one-third of patients indicate it is challenging to meet the cost of their deductible. The economic burden of healthcare results in about 50% of people reporting they or a family member has delayed care (Kirzinger et al., 2019). The cycle of noncompliance is a circular function feeding upon itself. Health care expenses rise and are passed on to the patient. The patients then become non-adherent secondary to the cost resulting in poor health outcomes. Increased levels of poor health outcomes result in increased resource utilization. Increased utilization then results in higher prices, and thus the cycle continues. In economic terms, the cost of non-adherence is 3% to 10% of the annual United States healthcare spending, calculating to virtually $100 to $300 billion annually (Iuga & McGuire, 2014).

DISCUSSION

The focus of the Healthcare Iron Triangle is improving access to care, improving the quality of care, and decreasing the cost of care. The selected articles confirm why the cost is considered the third leg of the Iron Triangle. Patients faced the decision of how to meet basic needs, including shelter and food, while trying to balance the rising costs of healthcare. The literature demonstrates, time-and-again, patients often engage in behavior attempting to mitigate the expense through delaying or deferring care. The delaying and deferring of healthcare due

to cost are also known as cost-related noncompliance (CRN). The burden of rocketing healthcare costs influences the decisions of families from multiple socioeconomic backgrounds and is not only limited to low-income families. Further, insurance status is not a guarantee of adherence to medical treatment. Patients with private insurance, public insurance, traditional deductibles, or high-deductible health plans are all susceptible to the mounting expenditures and ensuring decisions on the best method of navigating the expense.

The consequences of CRN to the individual are extensive, including worsening of health, the progression of the disease, reduced quality of life, and shortened life expectancy. The repercussions of CRN to the healthcare system are increased resource utilization resulting in higher spending. Healthcare systems are not able to absorb the higher usage of services and the associated expense alone and begin to shift the cost to patients. Thus, the cycle of CRN renews. As rising healthcare costs are passed on to patients, who cannot afford the care, often delay or defer treatment, thereby worsening their conditions. The worsening conditions require additional or more expensive care, which, in turn, creates more extensive healthcare expenditures. The increase in healthcare spending is then distributed among the patient cohort through increased cost-share via premiums, deductibles, or percentage of co-insurance.

CONCLUSION

The third leg of the Iron Triangle is the aim to decrease the cost of care. It is also arguably the most critical leg of Kissick's concept. The quality of care and access to care means little when patients cannot afford the care. The current literature available provides multiple sources documenting incidents of CRN and the associated causes. However, there is limited data on the forms of care patients delay or defer besides pharmaceuticals. Future research topics related to CRN are vast. They include the question of what type of care most frequently delayed or postponed or what kind of delayed or deferred care has the most substantial future financial impact on the individual and to the healthcare system. Another significant area of future research is related to determining the most critical factors impacting the decision of which type of care to delay or defer. The answer to any of these questions may allow for the development of effective policies leading to increased patient adherence, which, in turn, would potentially decrease the impact of CRN and strengthen the third leg of the Iron Triangle.

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HEALTH & WELLNESS CLUB: SELF-CARE

Rodeen Lechleitner

ABSTRACT

Practicing self-care connects with the ability to fulfill educational opportunities. Health & Wellness Club students were assessed to determine if they understood and practiced self-care. Four self-care seminars were conducted during activity days. The Health & Wellness Club's activities were planned, implemented, and tracked according to Health Education standards based on the preliminary assessment. Health & Wellness Club students were taught a facet of self-care during each activity session. The sessions were entitled Self-Care, Meditation, Stretch for Success and Therapeutic Communication. A cross-sectional study design was used to examine the impact of the Health & Wellness Club: Self-Care program. Participants were assessed on the Professional Quality of Life Measure before and after the four activity sessions. The aim of this study was to determine the impact of the program on students' perception of self-care.

SOCIAL DETERMINANTS OF HEALTH

Maitri Shah, University of Scranton
John P. Wiercinski, University of Scranton

ABSTRACT

Despite the fact that United States spends more on healthcare than any other country, both in absolute numbers and on per capita basis, the health status of Americans ranks relatively low as compared to other developed countries. Some of the primary reasons that contributes toward this are the Social Determinants of Health. The conditions in which people are born, raised, and work and how they respond to those conditions. Socioeconomic status (as determined by income, education, ethnicity), Health Behaviors, Access to Healthcare, and Physical Environment are the key drivers to health and health outcomes. According to the Kaiser family foundation research, social factors accounts for over one third of the total deaths across the United States. There exists a direct link between low income and increase tendency to smoking and shorter life expectancy. Another example unfolding the linkage of social determinants of health impacting health outcomes is increased amount of stress leading to health disparities among rural and underserved areas of the country and the living environment affects the health of future generations. As future healthcare leader, initiatives to develop health promotion strategies to reach out to our community by assessing and addressing social needs to create holistic and equitable healthcare system will ensure better outcomes.

TRACK

EDUCATION

ATTITUDES OF PHARMACY STUDENTS TOWARD GUN VIOLENCE ON CAMPUS

Ateequr Rahman, University of Medicine and Sciences
Yelena Sahakian, University of Medicine and Sciences

ABSTRACT

There is a wide belief that there should be restrictions on the accessibility of guns due to increasing gun violence. Some believe in the feeling of safety from owning/carrying their own firearm, while others feel more unsafe. This study assesses pharmacy student opinions on gun violence at Rosalind Franklin University. The majority of students were not concerned and anxious about gun violence occurrence on campus. They disagreed with professor carrying guns for self-defense, but agreed to students doing so. Most students did not find it necessary to have security measures in place on campus. The majority agreed on having armed officers on campus, banning large capacity clips, obtaining a mental health exam and reporting its status for those looking for owning a gun. The overwhelming majority across age, race, sex, ideology and year in pharmacy school disagreed on the US government doing enough to address the gun violence issue. Student opinions differed significantly based on gender, ideology toward mental health interventions, ban on assault weapons and capacity clips, as well as the use of security measures and the government role in gun violence. Policymakers, colleges of pharmacy and various practice settings should have procedures in place to address gun violence more explicitly in their work settings. US government should support public and private institutions to create a feasible community partnership supporting mental health screenings for individuals looking for purchasing a gun.

INTRODUCTION

Culture

United States of America was built on the principle of freedom, equality and justice. As our forefathers drafted the ideals of this country, they included the second amendment which states, “the right of people to bear arms, shall not be infringed.” The second amendment has been a topic of controversy with recent events of mass shootings and increasing amounts of gun violence. Many people believe that there should be more restrictions on the accessibility of guns due to these events and trends. The gun culture in the United States has spurred from old time views of being prideful in the guns that they owned whether it be for protection or as a collection or hobby. If you look back to when this country was founded, a gun was almost a necessity in every household from hunting for food or for protection from intruders. As the United States increasingly became more advanced, there was a change from the need for guns to instead having guns for more recreational use.

Some of society still believes in the feeling of safety from owning or carrying their own firearm, but others believe that this makes them feel more unsafe. There have been many studies with surveys sent out to field the public's opinion about carrying a firearm in public places like college campuses and schools, religious settings, malls, and more. In a study assessing the public's opinion about carrying firearms in public places, they concluded that about two thirds of Americans believed that guns should not be carried on college campuses. [1]

In another study about student opinions on gun violence and laws, women were more likely than men to believe that assault weapons should be banned but also more likely to believe that teachers and professors should be allowed to carry a registered weapon in schools.[2] A majority of the participants also believed that there should be more security precautions in schools. The top four factors contributing to gun violence ranked by the participants were decline in parenting and family values at 17%, gang involvement at 14%, bullying at 13.8%, and the fact that guns are easy to obtain at 13.8%.

Statistics in U.S. vs. other countries

In the United States, the number of gun violence related injuries and deaths have seen a significant increase over the last 10-20 years. In comparison to other countries, the United States is one of the top-ranking countries to have the most gun related deaths at a staggering average of 4.43 people per 100,000 in 2017.[3] Despite the rise in gun violence over recent years there has been a 7% decrease in gun related deaths and injuries in 2018 compared to 2017 data. In 2017, there were 15,658 gun-related deaths and 31,258 gun-related injuries in the united states. In 2018, the numbers were down for the first time in 5 years with 14,623 gun-related deaths and 28,159 gun-related injuries in the US.[4] These numbers can be slightly deceiving as it does not include suicides which accounts for a lot of the gun related deaths.

Countries such as Japan, Norway, the United Kingdom, and Australia have very low rates of gun related injuries and deaths. These countries have taken action in different ways to lower their rates. For example, in Australia, the Prime Minister John Howard devised a buyback program, where the Australian government bought and destroyed more than 600,000 automatic and semiautomatic weapons.[5] This decreased gun related suicides significantly to 0.8 per 100,000 people in 2006 from 2.2 in 1995. Firearm homicides also dropped in half from 0.15 per 100,000 people in 2006 from 0.37 in 1995. Japan on the other hand has strict laws for obtaining firearms, with rarely more than 10 gun-related deaths per year. In order for a person in Japan to own a firearm, they must attend an all-day class, pass a written test, and achieve at least a 95% accuracy during a shooting range-test. On top of that, they also have to pass a mental-health exam and background check, which all of this needs to be repeated every three years. Norway and the United Kingdom have had similar outcomes from these approaches.

Mental health related incidents

Often when a mass shooting occurs, one of the first things that is routinely discussed as the cause is that this person must have been mentally unstable, which can be true to some regards, but it would be unjust to stereotype individuals with mental illness by saying that they are the most likely to cause such violence. In fact, those who are mentally ill, are more likely to be a victim to violence than the perpetrator. According to the National Alliance on Mental Illness (NAMI), the research on gun violence related to mental health is dependent on specific factors which include, co-occurring abuse of alcohol or illegal drugs, past history of violence, being young and male, and untreated psychosis.[6] The NAMI, says that the best way to reduce risk is through treatment, policies and programs need to be available and accessible as often people that commit acts of violence with mental illness is the result of them having a lack of diagnosis or mental health services. If more federal or state gun laws are created on the basis of mental illness, this could create more barriers to those who are willing to seek help and treatment. It is important for the government to fund programs focused on early identification, early intervention and evidence based mental health treatments. The NAMI suggests, that the federal and state reporting laws should have changes to the National Instant Criminal Background Check System.

On campus gun violence

Some of the most devastating mass shooting in US history were ones on school campuses. Two of the most recent and deadly shootings was that of Sandy Hook Elementary School in 2012 with 26 victims and Virginia Polytechnic Institute (Virginia Tech) in 2007 with 32 victims.[7] In the case of Virginia Tech, Seung-Hui Cho, was an English Major at Virginia Tech, and went on a shooting rampage in one of the campus halls.[8] Seung-Hui Cho, shot 27 students and 5 faculty members with a 9-millimeter handgun and a 22-caliber handgun, carrying hundreds of rounds of ammunition. Seung-Hui Cho, then killed himself with a self-inflicted gunshot wound. Classmates and professors of Cho, described him as “a loner who rarely spoke to anyone, with a history of mental health issues.” Also, professors of his said some of the assignments he would turn in were angry and violent.

Similarly, in the case of the Sandy Hook shooting, the shooter Adam Lanza, was quiet and socially awkward who, classmates described as fidgety and deeply troubled.[9] Lanza had been previously diagnosed with Asperger’s syndrome and had a falling out with his best friend. On the morning of December 12, 2012, Lanza shot his mother in the head took her car and drove five miles to Sandy Hook Elementary School and went to two

different first grade classrooms killing 20 children and 6 teachers only two victims that were shot by Lanza survived. Lanza had shot off between 50-100 rounds using an AR-15 semiautomatic rifle. After, killing a total of 27 people, Lanza turned the gun on himself. The police's report of the shooting described that they found weapons with a numerous amount of ammo in his room and a number of books and articles on mass shootings. There was no clear distinction to what Lanza's motive was or why he did what he did.

A federal policy, named "Now is the Time" is worth to note. IT was developed by the Obama administration, which called for closing background check loopholes to keep guns out of dangerous hands, banning military assault weapons and high capacity magazines while limiting ammunition rounds to 10. The policy also stressed the importance of making schools safer and increasing access to mental health services. [10]

The aim of this study is to examine pharmacy student opinion about gun violence at Rosalind Franklin University of Medicine and Science. We hypothesized that the majority of the students will be against carrying a gun on campus due to concerns about student and faculty safety, and the responses will vary based on gender, age, race, political affiliation, and household gun ownership status.

Literature review

Miller et al. studying 119 4-year colleges regarding gun possession and gun threats with a sample size of more than 10,000 undergraduate students noted that 4.3% of the students reported that they had a working firearm at college. [11] 1.6% of them have been threatened with a gun at school. Of the 4.3% that had a firearm at college, 47% said that they had the gun for protection. The study findings suggested that students who report having guns at college disproportionately engage in behaviors that put themselves and others at risk for injury.

Sorenson investigated in a survey strategies to make surveys more useful to policy makers, researchers, and the general public.[12] The respondents evaluated the effectiveness of "Seven-Gun" policies about the type of gun violence and its magnitude. Sorenson found that participants indicated strong support for all of the policies and expected them to be effective. It was found that despite participants not supporting a policy, it doesn't mean they think that it won't be effective.

Wolfson et al. wanted to estimate US public opinion overall and of those who own firearms, on what public places gun owners can be allowed to carry their firearms.[1] An online survey of 3949 adults showed that less than 1 in 3 US adults supported gun carrying in public places, including restaurants, schools, bars, sports stadiums, retail stores and other venues. Those that owned a gun were more likely to support carrying in public places than non-gun owners. Overall, the support for carrying a gun in public was lowest for school at 19%, bars at 18%, and sports stadiums at 17%. Wolfson et al. concluded that most Americans supported restricting the places that gun owners can carry. However, state legislation was working to expand where, how and by whom guns can be carried in public.

Lewis et al. conducted a study to gather the opinions from 419 college students at a Midwestern University.[2] The online survey asked participants about beliefs about purchasing assault weapons, bringing handguns to college campuses, and contributing factors leading to gun violence. The results showed that 54% of participants believed that assault weapons should be banned and 53% said that teachers should be allowed to carry a registered handgun on campus. Females believed military assault weapons and high capacity magazines should be banned more than 1.9 times in comparison with males ($p=0.004$). Female students were also 1.55 times more likely to believe that school teachers should be allowed to carry registered handguns on school campuses ($p=0.046$). There were no statistically significant differences between ethnic groups. The top four factors participants believe contributed to gun violence were decline in parenting and family values at 17%, gang involvement at 14%, bullying at 13.8%, and guns being easy to obtain at 13.8%.

Bergstein et al. wanted to determine the nature and causes of gun violence among urban 7th and 10th graders in Boston and Milwaukee to determine their attitudes and behaviors toward violence and handguns.[13] The factors associated with gun handling were male gender, being a 10th grader, students stating to have poor grades, seat-belt non-users, cigarette smokers, and household gun ownership.
Another study by Lewis and Huynh also reported that males were 3 times more likely to agree on whether there should be laws prohibiting persons with mental illness to carry hand guns.[14] Fifty percent of males owned a gun as opposed to 17% of females with a statistically significant difference. The study, however, did not find any differences in terms of religion, political affiliation, race and age having a role in student opinions on gun violence.

The literature review brings an interesting insight into factors associated with gun violence. As we can see, the opinion about the importance of public safety and avoidance of gun violence is relatively uniform. However, multiple factors come into play when examining student opinions. These factors are not consistent across states, graduate schools. It is important to study this research question school by school to gain a better insight into graduate student attitudes which can vary from year to year.

METHODOLOGY

This study looked at attitudes of pharmacy students toward gun violence on campus. We hypothesized that there is a difference in student opinions based on gender, race, age, political affiliation, as well as household gun ownership status. Apart from the variables mentioned above, we also examined the opinion based on pharmacy student class affiliation (P1, P2, P3 or P4) and other variables.

Research participants were administered an online survey with an informed letter attached to it. The respondents were not identified with their responses, and that the participation was entirely voluntary.
The survey consisted of a 10-question demographic part asking about gender, age, class affiliation (years 1 through 4), race, household un ownership, political affiliation, etc. The rest of the survey asked 17 opinion questions with Likert-scale responses. The survey instrument was tested for ambiguity for understanding of the words used. The readability of the survey was found to be at a grade of …? The reliability of the survey instrument was tested using …. The study was approved by Rosalind Franklin University Institutional Review Board (IRB).

RESULTS

Table 1 and 2 depict the questions asked in the survey. The results showed that:

Table 1. Demographics

Variables	**Frequency**	**Percentage**
Age		
20 – 25	102	65.8
26 – 30	36	23.2
31-35	9	5.8
36 and above	6	3.9

Gender		
Male	82	52.9
Female	71	45.8
Year		
P1	36	23.2
P2	43	27.7
P3	38	24.5
P4	36	23.2
Race		
Caucasian	69	44.5
Hispanic	21	13.5
African American	15	9.7
Asian	48	31
Past family gun ownership status		
Yes	44	28.4
No	109	70.3
Ideology		
Conservative	58	37.4
Liberal	95	61.3
Carrying a weapon at school		
Yes	3	1.9
No	150	96.8
Training on firearm possession		
Yes	65	41.9
no	87	56.1
Current gun ownership status		
Yes	20	12.9
No	133	85.8
Current family gun ownership status		
Yes	92	59.4
No	61	39.4

Table 2. Stratification of dependent variables according to demographic groups			
Question	**Gender P value**	**Ideology P value**	**Mean (SD)**
I am scared when I am on campus that gun violence may occur.	0.000	0.000	1.99 (±1.50)
I believe that professors should be able to carry registered guns for self-defense.	0.000	0.001	1.99 (±2.81)
I believe that students should be able to carry registered guns for self-defense.	0.000	0.001	3.99 (±1.29)
I believe that campus security should be able to carry registered guns for self-defense.	0.000	0.032	4.27 (±0.90)
I feel anxious that gun violence will occur on campus.	0.000	0.016	2.84 (±1.67)
I believe that to own a gun there should be universal background checks.	0.027	0.000	4.05 (±1.21)
I believe that assault weapons should be banned.	0.000	0.000	3.15 (±1.80)
I believe that there should be armed officers on campus.	0.000	0.000	4.12 (±1.41)
I believe that large capacity clips should be banned.	0.000	0.053	4.56 (±0.85)
I believe that states should be report mental health status for those obtaining guns.	0.000	0.119	4.33 (±1.13)
I believe that in order to obtain a gun a mental health exam should be performed.	0.000	0.05	2.44 (±1.77)
I believe that security measures should be in place on campus.	0.000	0.142	1.45 (±2.02)
I believe that the US government is doing enough to address the issue of gun violence.	0.021	0.161	1.13 (±0.53)
I feel safe on campus.	0.000	0.060	3.44 (±1.73)
I believe the practice of pharmacy is safe from gun violence.	0.000	0.002	1.78 (±1.40)
I believe the practice of pharmacy in a community setting is safe from gun violence.	0.000	0.034	1.61 (±0.85)
I believe the practice of pharmacy in a hospital setting is safe from gun violence.	0.000	0.080	3.90 (±1.35)

The majority of students were not concerned and anxious about gun violence occurrence on campus. They disagreed with professor carrying guns for self-defense, but agreed to students doing so. Most students did not find it necessary to have security measures in place on campus. The majority agreed on having armed officers on campus, banning large capacity clips, obtaining a mental health exam and reporting its status for those looking for owning a gun. The overwhelming majority across age, race, sex, ideology and year in pharmacy school disagreed on the US government doing enough to address the gun violence issue safety issue, which should be addressed in immediate future. States and the federal governments and local law enforcement agents are on the frontline of ensuring public safety and preventing gun violence. However, this won't happen unless the society raises this question to authorities to take the matter in hands. Despite student opinions being heavily influenced by recent cases of gun involvement or gun violence, personal experiences of students, geographical area they leave or have born in, student upbringing, political and societal views, student opinion about gun violence is relatively uniform in terms of avoiding public threat and jeopardizing public safety.

One limitation of this study was that the survey was administered on paper during the last 10 minutes of the lecture. The respondents may have not felt encouraged to provide accurate, honest answers because of rushing to get out of the classroom or feeling a pressure of completing the survey within a limited time period.

Despite the demographics being a true reflection of the campus community, the opinions survey methodology only captures how students are feeling at the moment and does not capture any future changes in their opinions. Lastly, students might have given socially desirable responses rather than true and honest ones, which

could have impacted the results and how we can use the results to implement informed decisions concerning gun violence policy in the future.

CONCLUSIONS

US government should support public and private institutions to create a feasible community partnership supporting mental health screenings for individuals looking for purchasing a gun. [14] University campuses and other educational facilities can implement "Now is the Time" policy recommendations and work together with the community to provide mental health services. Lastly, insurance companies should offer such services just like other medical services to their beneficiaries.

Future studies should address carry out interviews and create focus groups including representatives from all of the ethnic groups to have a better insight into gun violence in the US and come up with solutions based on specific factors and variables. It is also important to interview faculty and staff on campus, and compare their opinions with those of students. Student opinions can serve as a groundwork for development of public policies aimed to reduce gun violence.

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OVERCOMING OBSTACLES IN ONLINE EDUCATION

Kelly Duffy, Daytona State College
Lina Miles, Daytona State College
Jane Rosati, Daytona State College

ABSTRACT

The traditional classroom setting has lost some of its appeal to the 21st century learner. Students want to be engaged in their learning and they want it applicable to real-life experiences. A new generation of learners have emerged with different preferences and learning styles. Online classrooms allow students, of all ages, the liberty to engage in learning at a specific pace, and on more acceptable terms. Almost every school, from elementary through higher education embraces some form of online learning. Taking a closer look at the online learning environment reveals that positives and negatives do exist within this genre.

Some of the most wide-spread negative issues found in online education are technical difficulties, internet connectivity, computer literacy, time management and self-motivation for learning. How can the student receive assistance to overcome these obstacles and be successful in this environment? Faculty must have the ability to develop solid approaches that meet the needs of all learners. Technological and curricular proficiency assists faculty and students to successfully navigate the negative issues of the online environment. This workshop allows the participants to address the negative aspects of online learning and combat them with positive interventions to provide successful outcomes.

Educational pedagogical strategy is an evolving practice in which the traditional instructor-centered monopolization of the classroom is now replaced by student-centered interventions within an online setting. The student-centered approach includes the fluid adaptation to the constantly changing complexities of online instruction. Conceptualization and acceptance of change in the teaching-learning environment is critical in the support of student success. The fundamental discovery of new or improved methods for curriculum design, meeting learning outcomes, and facilitating communication requires the embracing of a faculty new role.

IMPLEMENTATION OF A CULTURAL IMMERSION PROGRAM

Crystal Marchant, Clayton State University
Rebecca Morgan, Clayton State University
Comfort Obi, Clayton State University
Lisa Eichelberger, Clayton State University
Victoria Foster, Clayton State University
Lisa Smiley, Clayton State University
Elicia Collins, Clayton State University
Deborah Gritzmacher, Clayton State University
Angela Hollis, Clayton State University

ABSTRACT

There has been a growing demographic change in the United States and with today's technology, people are exposed to many different people of various backgrounds and cultures. This cultural shift has affected healthcare and nursing education. The purpose of this study is to discuss the development and implementation of a cultural immersion experience with South Korean nursing students in America and to describe essential concepts implemented in the development of the cultural immersion/collaboration program.

This is a descriptive non-experimental study about the development and implementation of eight cohorts of South Korean nursing students who participated in a study abroad program at Clayton State University. A total of 110 students have participated in this program over the course of five years. For data collection, questionnaires were used to collect data including demographic information, experience in the United States, and questions comparing study skills in Korea and the United States.

Students are exposed to a number of opportunities for cultural immersion (i.e. clinical experiences, Nurses Day at the State Congress, a Center for Disease and Prevention tour, dormitory accommodations with other students, classroom interactions). Based on approximately 80 South Korean students and instructor evaluations, the objectives were met for the program (the opportunity to embrace the American Society and Cultural practices). The Korean nursing students also expressed gaining knowledge of being able to compare and contrast American nursing roles and responsibilities to Korean nursing roles and responsibilities. The students also identified the different cultural practices pertaining to holistic care of the patient, alternative therapies and treatment, along with death and dying rituals.

Results indicated that nursing educational programs in both countries are rigorous however, students' clinical experiences in both countries vary. Foreign students participating in cultural collaboration programs in the United States experience communication barriers but gain cultural sensitivity. Study abroad programs therefore serve to expose and enhance participants' knowledge of health care practices that they can adopt in their future practice to serve a more diverse population.

PREDICTING STUDENT PERFORMANCE DURING THE FIRST SEMESTER OF A HEALTH PROFESSIONS PROGRAM

Cynthia Naughton, North Dakota State University
Dan Friesner, North Dakota State University
Kelly Haugen, North Dakota State University

ABSTRACT

Unlike other, more traditional academic degrees, health professions programs exist solely to prepare students to pass a particular licensing and/or registry exam, and to enter a specific area of (clinical) professional practice. These programs strive to ensure that, not only do students have specific knowledge, skills, and abilities upon graduation, but also that they acquire these competencies in a particular order to ensure that a student's transition through the licensure/registry process and into practice is as seamless as possible. As such, the admission requirements, professional academic curriculum, co-curricular requirements, and experiential/clinical trainings that comprise the degree are identified and operationalized in a highly integrated fashion. A primary goal of health professions accrediting bodies, and to a lesser extent oversight by government regulatory agencies, is to ensure quality control in the health professions educational process.

Health professions programs also require a substantial investment on the part of both students and the program. Most health professions programs admit students through a competitive process that includes an evaluation of academic performance within a pre-defined set of undergraduate courses, as well as an evaluation of those "soft skills" necessary to provide competent and compassionate patient care. Once accepted, students typically pay tuition that exceeds what is assessed to students in non-health-related programs at a similar level of education. If a student does not complete the program, many of the courses completed do not transfer seamlessly to other majors. Faculty and staff bear a greater responsibility to ensure that students successfully pass their licensure and/or registry exams when they graduate. As noted earlier, health professions programs are subject to greater oversight by accrediting bodies and regulatory agencies, which means that these faculty and staff must spend disproportionately greater time in curricular design and assessment activities to ensure quality control in the educational process and justify these contentions to external stakeholders. Moreover, health professions programs must do so in a manner that, like other units within an academic institution, preserves academic freedom and promotes shared governance. In other words, while the curriculum is highly integrated, and programs are responsible to external stakeholders, the program's faculty/staff must continue to have the autonomy to offer courses in a manner that they deem appropriate.

Students who fail to successfully complete a health professions program sit squarely in the center of these incentives and constraints. They have invested heavily in their education with little return. They fail to progress for a myriad of different possible reasons, including (but not limited to) a lack of preparation, lax admission standards, a change in professional interests, a lack of work ethic, emerging mental or physical health conditions, or any combination thereof. Some of these causes are observable or predictable, while others are latent to the program and its faculty/staff. Accreditation bodies, recognizing this, take a very specific approach to non-matriculating students. Programs have full authority to enforce academic and professional standards. Those standards are high, and there is a recognition that some students will not successfully matriculate through the program. However, health professions program are required to track student progression, identify students who are at-risk of not matriculating (in a legally appropriate manner) and intervene if possible. Perhaps more importantly, accreditors strongly prefer (and expect) that the majority of student attrition (or non-matriculation) occurs during the first semester or year of the program,

rather than at the end of the program. Predicting success during the first semester of a health professions program, then, becomes of great concern.

In a recent study, Friesner and Haugen (2019) developed a simple statistical model to identify students who were at risk during the first year of a Doctor of Pharmacy program. The model used predictors that were derived from the program's admissions process. The measure of success (i.e., the outcome) was global; successfully completing all of the courses in the first year of the professional program. While useful from a very general perspective, it does not provide insights about how to identify students who become at risk during the first semester of the program. This requires the development of a profiling model that uses a more granular outcome measure.

This paper develops a profiling model of success during the first semester of a Doctor of Pharmacy program. Unlike Friesner and Haugen (2019), success is measured at the course level. We select two of the more difficult courses (Pathophysiology and Principles of Pharmacokinetics/Pharmacodynamics) that students complete during their first semester of the program. Our outcome measure is the score students earn on the first exam in each of these courses. Predictors of success continue to be variables collected as a part of the admissions process. Maximum likelihood regression models are developed using these covariates to predict scores on the first exams in each of these courses. We build these models using data from three successive years of incoming students in the North Dakota State Doctor of Pharmacy program (i.e., the 2017-2019 incoming classes) to determine if the results are sensitive to the cohort of students admitted in a given year.

INTERNSHIPS: DISTINCT ADVANTAGE?

Heather Ruggiero, Clayton State University
Neena Smith-Bankhead, Clayton State University
Marcia Butler, Clayton State University
Deborah Gritzmacher, Clayton State University

ABSTRACT

Many fields of study require internships, some lengthy, to complete a degree. Health Care Management is one of the fields. To be a certified program and member of the Association of University Programs in Health Administration (AUPHA), programs must include an internship. The number of hours required varies as does the acceptable sites. This course allows for the advantages of learning experientially as well as theoretically. This unique Health Care Management program allows experiences in hospitals, offices and clinics, non-governmental organizations (NGO), as well as specialty interest organizations such as Make a Wish Foundation or the Lung Association and many more.

A MODEL FOR COMMUNICATIONS SKILLS TRAINING IN GRADUATE HEALTH MANAGEMENT EDUCATION

Daniel J. West, The University of Scranton
Bernardo Ramirez, University of Central Florida
Cherie Lynn Ramirez, Simmons University

ABSTRACT

Graduate MHA programs use a body of knowledge to develop the curriculum and courses. This body of knowledge draws upon various disciplines and focuses on developing management and leadership competencies. The Commission on Accreditation of Healthcare Management Education (CAHME) has specific criteria addressing communication and interpersonal effectiveness.

The International Hospital Federation (IHF) and the American College of Healthcare Executives (ACHE) address leadership competencies for healthcare service managers. This presentation discusses a model of communication skills training (CST) that is unique but effective in addressing and developing specific skills. Seven (7) years of outcome data is used to demonstrate how second year MHA graduate students perceived the value of the training model. The CST model can be used to modify attitudes, behaviors, and effective transcultural communication. The current presenters have been teaching management skills globally and will discuss the potential use of this model in other countries.

I CHEATED THEN AND I CAN CHEAT NOW

William "Kent" Willis, Marshall University

ABSTRACT

Questionable academic behavior, academic integrity or simply "cheating," whatever the preferred terminology students/faculty chose to use, is a critical concern on college campuses. Questionable ethical behavior in academics is noted within early Chinese civilizations (Lang 2013), thus what research has illustrated of cheating in today's academic world should be nothing new nor surprising to faculty and students. A literature review of academic integrity demonstrates that cheating is not confined to the collegiate ranks. Studies have shown cheating occurs at the elementary age where during these formative years the parent is often tasked with trying to instill proper academic behavior for their child (Shellenbarger 2013, NPR News 2013). Academic cheating occurs at the secondary high school level of education; this includes high school students attending high performing schools (Perez-Pena 2012, Selby 2019).

Cheating at the collegiate level is demonstrated across all disciplines of collegiate education (Khalid 2015). As cheating occurs at all disciplines of college education, the question(s) of college students associated with the practice of cheating creates ethical and social concerns (Kaufman 2008). Ethically, why do college students find it necessary to cheat, what motivates them to cheat, and how do they justify cheating as an ethically proper thing to do? Socially, what impact will academic cheating have on the social norms of hard work for high achievement, integrity and fairness in worldly dealings (Anonymous, University of Illinois)? Many questions surround the concept of questionable academic behavior.

This research study provides the results from a survey of college students on the campus of a midsized university with multidiscipline degree offerings. The results of the study allow for comparisons of similar research study results from other universities or colleges, as well as, a comparison with the results of an earlier study from the same midsized university. The current study considers the technology available to students for purposes of cheating, whereas the earlier study displayed no results from a technological aspect. Additionally, the results will assist in examining remedies for such unethical acts as academic cheating.

The comparison study (Brown and McInerney 2008), examined the ethical rating of 16 academic practices that might be considered unethical or academically dishonest in the year 2006. The study also asked respondents to provide their opinion on reasons why students might engage in these behaviors by ranking various given reasons on a 5-point scale from not at all likely to very likely. Reasons included items such as peer pressure and the need for a good grade. While not addressed in the current study, the Brown and McInerney research did attempt to ascertain actual engagement by students in the dishonest behaviors.

TRACK

HEALTH INFORMATICS AND TECHNOLOGY

MODELLING DIMENSIONS OF PATIENTS' EMPOWERMENT IN E-HEALTH SYSTEMS: PERSONAL, SOCIAL AND MEDICAL

Muhammad Anshari, University Brunei Darussalam
Mohammad Nabil Almunawar, University Brunei Darussalam
Mustafa Z Younis, Jackson State University
Adnan Kisa, Kristiania University College

ABSTRACT

Empowerment is an important feature recognized as strategy for e-health services to improve health literacy and customers' satisfaction. The population sample for this study were intentionally selected from patients or patient's family to measure the respondents' demand for the proposed e-health model. The model accommodates thee distinct dimensions of empowerment into an individual health actor, social health agent, and medical partner. This study is theoretically significant because it explores the new approach to the e-health or mobile health system in order to achieve best practice patient service, establishing long-term patient relationship to improve patient satisfaction, and better health literacy of individuals.

INTRODUCTION

Early adoption of Information and Communication Technology (ICT) by healthcare organizations is aimed to improve the quality of service in healthcare information management (Chute et al., 1998; Ginter et al., 2018). Furthermore, the quality of healthcare delivery has become increasingly dependent on correct, accurate, and detailed information (Chute et al., 1998). One of the most valued aspects of ICT in most industries is its capability to enhance an existing human processes or functions, which then will improve the flow of information in the healthcare management (Cheng et al., 2008).

E-Health was introduced to fully utilize ICT to provide a better healthcare service. HIS is the intersection between healthcare's business processes and information system (Roshanghalb, et al, 2018). It frequently refers to the interaction between people, processes and technology to support information processing and communication tasks of medical practice, education and research in order to improve the quality of healthcare services. As a result, in improving the efficiency and effectiveness of services in healthcare organizations, e-health has become a standard practice (Chaudhry et al., 2006; Gossec, et al, 2018).

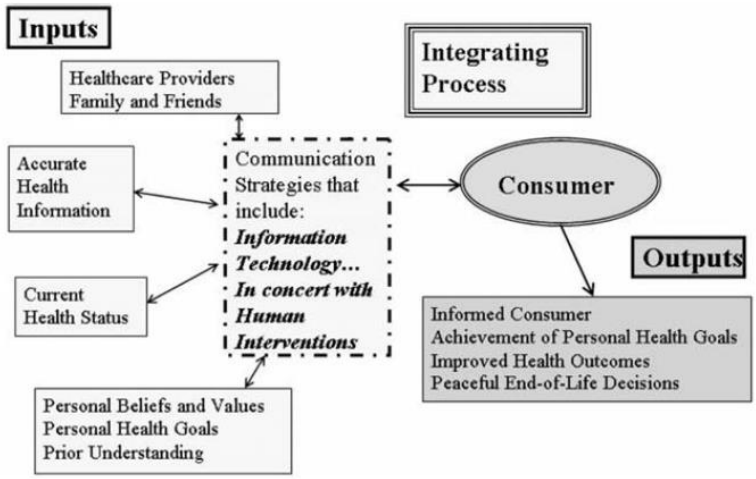
The study proposes model in e-health to enhance existing theory of e-health in relation to patient empowerment. The model extends the role of patient in three empowering dimensions; as an individual health actor, social health agent, and medical partner. This study is theoretically significant because it accommodates the new approach to the e-health system in order to achieve best practice patient service, establishing long-term patient relationship with healthcare provider to improve patient satisfaction, and better health literacy of patients. This study is also important for health organizations that seek innovative ways to improve their services and add more values to them. It is also useful for IT developers who need to fully understand the concept of behavioural change in consumers. Researchers who need to understand the issues of each domain and institution or end user to be informed what is best for them will get some benefits from this study as well. Government and policy makers, who seek a comprehensive solution for the next generation of e-health over their citizen, will get some insights from this study as it provides a mechanism to address complex problems with a comprehensive solution.

Customers in E-Health

E-health initiatives are progressively taking place all over the world, such as in Australia, the United States, England, and Canada (Hayrinen et al., 2008). E-health is also aimed to improve healthcare management for mutual benefits between healthcare providers and their patients. For example, e-health consortium in Ontario, Canada proposed three main strategies, to improve diabetes management, medication management, and waiting times (e-HealthOntario, 2009). These aims are in line with the aims of e-health proposed by the World Health Organization (2005) that is to provide healthcare service, health surveillance, health literature and health education, knowledge and research. E-health can also provide patients with opportunities to interact with their healthcare systems online, thus offering new forms of patient – healthcare provider interaction (Klein-Fedyshin, 2002; Halpert, 2018).

The urgency empowering patients in e-health services have been discussed in literatures. Many studies explored patients' needs to get access to health information and using it to make better decisions about their health (Lewis & Friedman, 2005; Ferguson, 2002; Lewis et al., 2005 Steinberg, 2018). Consumer Health Informatics Working Group and the International Medical Informatics Association (2004) have defined a health information consumer as a person who seeks information about health promotion, disease prevention, treatment of specific conditions, and management of various health conditions and chronic illnesses.

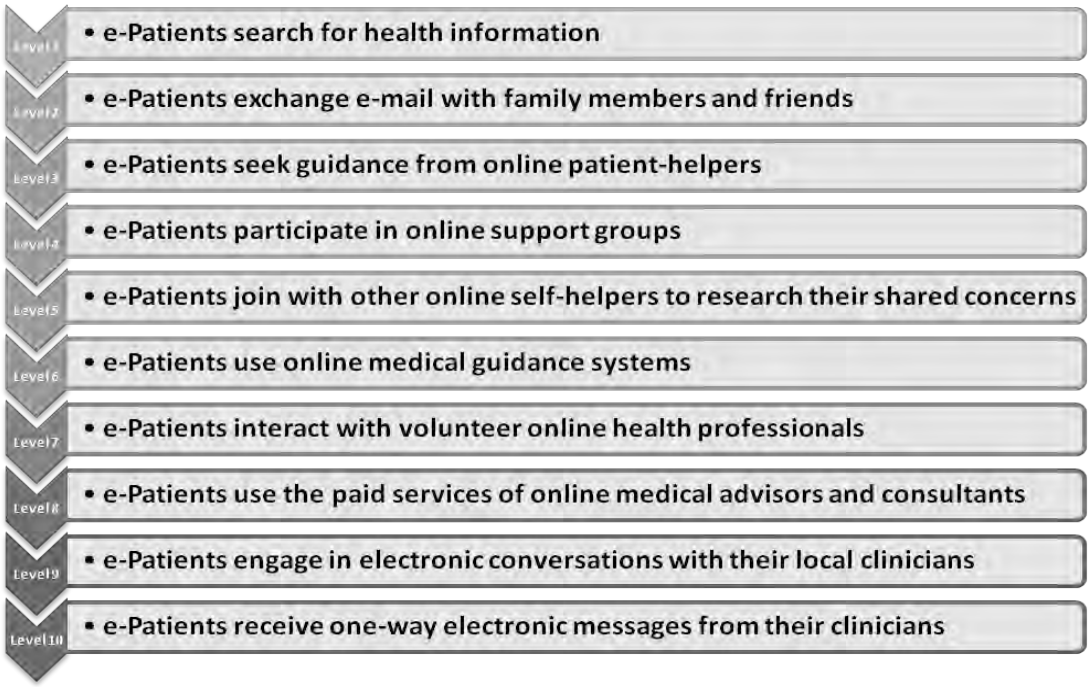
Figure 1. Model of Consumer Health (Source: Lewis and Friedman, 2005)



Lewis and Friedman (2000) have proposed also a model for consumer health informatics (Figure 1) that places the consumer at the centre of the process of information transformation. This model explains how relevant and valid information integrated appropriately into an environment of shared decision-making can improve both the satisfaction with the process of care delivery and measurable outcomes reflected in consumers' health status. While, ICT as a mode of message/information sharing, serves to assemble and process the information and act as a catalyst for feedback. The ideal system output is an informed healthcare consumer who is making healthy choices based on personal health goals that leads to improved health outcomes.

Consumers of health information consist of not only persons with specific health conditions, but also of the public concerned about promoting optimal health (Rupali, et al., 2018). Healthcare consumers are actively involved in seeking health information and in using the information to make decisions about their health. People seek healthcare information from a variety of sources, which include print and electronic resources, healthcare providers, other consumers, and their families and friends (Lewis et al., 2005).

Figure 2. 10 levels consumer participate in using healthcare information (Source: Ferguson, 2002)



Further studies by Ferguson (2002) described the importance of addressing the personal information needs of modern healthcare consumers: "When they have a serious medical concern, they (healthcare consumers) do not just accept whatever treatment their local doctor offers. They'll spend hours and hours on the Internet learning about their condition, communicating with other patients and clinicians who share their interests, and tracking down every lead they can find on the best new treatments." In addition, Ferguson (2002) has delineated 10 levels in which consumers take part in the access and use of health care information at Figure 2. However, Ferguson (2005) had not discussed on how a process of interaction between patients or social networks might be included in his consumers participation model. Therefore, this research fills the gap of consumers' participation especially embedding social networks in e-health scenario.

Social Networks in Health Care

Then, the emergence of Web 2.0 has changed the ways in which many organizations operate including healthcare services. Web 2.0 refers to the concept that the Web is a platform which features the social network as groups of individuals who support conversation and interactivity. The concept of Web 2.0 began with a brainstorming session between O'Reilly and MediaLive International (O'Reilly, 2006). It has been defined as a set of economic, social, and technology trend that collectively form the basis for the next generation of the Internet – a distinctive medium characterized by users' participation in using networks such as *Facebook*, *Twitter*, *Myspace*, *Friendster* and *Linkedln* which have indeed grown rapidly, facilitating peer-to-peer collaboration, ease of participation and ease of networking.

The Web 2.0 has enabled customers to access and generate information on the products and services they are considering using from not only organizations but also from. Customer demands have changed because they have been empowered by the amounts of information available to them (Anshari & Almunawar, 2015). Greenberg (2009) explained these changes and the customer's ownership of the conversation ultimately leads to organizations readjusting their business strategy. This step is supported by a technology platform, business rules, processes, and social characteristics which helped to redesign the stratagem to one which engages the customer in a collaborative conversation in order to provide mutually beneficial value in a trusted and transparent business environment. Web 2.0 has also affected to the healthcare industry in dealing with customers (patients).

The booming number of social networking groups and support groups for patients on the Internet and their influence on health behaviour is only beginning to be explored and remains an important area for healthcare research (Rimer et al., 2004). Social empowerment shares similar healthcare objectives with the means of social network technology (Anshari & Almunawar, 2012). In other word, *this study proposes a model that supports each patient as a social health agent supported by Web 2.0 where they can share and support others to improve their health literacy.* Therefore, empowerment through social networks must contribute in the process of social support, sharing, and exchange. In order to achieve the objective, the adoption of social networks' paradigm into e-health/mobile health systems that will boost the empowerment process through social empowerment.

Furthermore, the impact of Web 2.0 technologies for health and healthcare continues to grow, and while the term Medicine 2.0 has entered popular categorization. Hughes et al., (2008) mentioned that the terms of Medicine 2.0 and Health 2.0 were found to be similar and categorized into five major notable core: (1) the participants involved (doctors, patients, etc.). (2) Its impact on both traditional and collaborative practices in medicine. (3) Its ability to provide personalized health care. (4) Its ability to promote ongoing medical education, and (5) its associated methods and tool related issues, such as potential inaccuracy in end user-generated content. Key distinctions are made between the definitions of Medicine 2.0 and e-health as the former puts more emphasis on personalized health care. However, other elements such as health or medical education remain common for both categories.

METHODOLOGY

The methodology adopted for carrying out studies in different areas are literature analysis, modelling framework based on literature study, constructing survey instruments to confirm the model as well as developing prototypes, finally testing the prototype through quantitative means to measure and customer satisfaction. The purposive sampling method is employed in which respondents were intentionally selected from patients who used the prototype systems. The survey measured the users' satisfaction for the proposed model. The survey was designed to learn whether the implementation of the proposed an e-health system could be helpful so that it may lead to improve customers' satisfaction. This study was important to reveal vital modelling compoents about how the patient feels about the system, to verify and improve the initial model, and to understand the responses of people regarding proposed features in the e-health services.

ANALYSIS

Consider the scenario when patients are tirelessly waiting to be diagnosed because the physicians are currently with another patient. The Long queue of patient waiting for consultations means that there is inefficiency in process and due to this, patients may become dissatisfied. This means that healthcare providers must allocate time more wisely in the future. A lot of thinking must be put into this scenario; a physician should be able to conduct diagnosis efficiently and effectively within the constraint of consultation time. The system supports the customer service because it helps both healthcare provider and patient in diagnose activity. The physician will have complete information, knowledge, learning about the patient medical history which the patient participated in the detailing themselves and hence saving a lot of time which is beneficial to both healthcare provider and patient because his medical records are overviewed in the full scene. In other words, it can provide better customer service to meet patient's expectation and improve the quality of consultation time. The physician is expected to have a comprehensive view of the patient's history before diagnosing or analysing the consulted symptoms. This can be achieved because physician will be able to observe the report medical history such as last medicine consumption, previous diagnoses, lab result, activities suggested by health educator, etc. However empowering patients with medical data and personalized e-health, the healthcare needs to provide officer on duty (health educator/ health promoter) in order to interpret medical data or respond online query/consultation. The officer on duty is required to have an ability to interpret medical data and familiar with the technical details of the systems.

The types of e-health systems chosen for the required analysis represent a diverse set of approaches for addressing the needs of the customers for Apps/Web enabled. In fact, the proposed system received superior ratings for meeting the needs of the customers. The results for the functional needs of the systems were summarized in Table

1. The prototype systems composes three module of personal, social (networks), and medical. The first features is personal abilities and majority of users are agreed with the proposed systems. Personal module are featuring ability to view own EMR, record health habits and activities, and support emotional and spiritual components as part of healthcare.

Since many healthcare organizations are not proficient in capturing the message from public conversations especially former patients in social networks. They did not consider social network in their means of building long-term relationship with their patients and as a result of poor relationship and lack of sensitivity to changes in communication, a healthcare management falls victim to patients judgements and criticisms regarding with services provided on social networks, leading to distrust towards the hospital's allegation and jeopardizing the business in the long run.

Table 1. Patients responds towards prototype e-health system

Module Components	Patients' preferences
Personal	
• View EMR	69 %
• Record health activities online	75 %
• Emotional & spiritual affect physical	100%
Social networks	
• Discuss health service in social networks	72 %
• Supporting group in social network	93%
• Discuss with patients same condition	80%
Medical	
• Consultation online	83%
• View EMR	69%

Further, it proposes internal social networks that operated, managed, and maintained within healthcare's infrastructure. This affects internal patients within the healthcare centre more to have conversations between patients/family within the same interest or health problem/ illness. For example, patients with similar diseases would be motivated to share their experiences, learning, and knowledge with each other. Patients are able to generate the contents of the Web so that they can promote useful learning centre for others. They can be the best place for supporting group and sharing their experiences related to all issues such as how the healthcare does a treatment, how much it will cost them, what type of insurance accepted by healthcare, how is the food and nutrition provided, etc. Therefore, this generic group grows depending on the need of patients in that healthcare centre. Creating internal social networks is part of the strategy for isolating problems within the organization focusing more towards internal problems which exist so it can be easily monitored and solved before it gets bigger and complicated. Moreover, this strategy will further encourage customers' service loyalty.

In general, the aim to put together linkage of internal and external social networks are to engage patients and export ideas, foster innovations of new services, quick response/feedback for existing services, and technologies from people inside and outside organization. Both provide a range of roles in-patient or his/her family. The relationships can create emotional support, substantial aid and service, influence, advice, and information that a person can use to deal with a problem. In addition, listening tools between Social Networks and e-health systems is a mechanism to capture actual data from social media and propagates this information forward to the systems. This tool should be capable to filter noise (level of necessity for business process) from actual data that needs to be extracted for developing strategies.

The healthcare provider assumed that everything was fine until the customer expressed their dissatisfaction through social networks and media. Responding to this problem, the healthcare provider supposes to isolate or prevent

the internal problem like customer dissatisfaction with quick response to resolve the issue before it gets bigger and uncontrolled. In the architecture proposed above, the internal social networks could be a solution to prevent similar problems in the future.

Business model

This section discusses business model and scenario to provide points of view of e-health process within the framework of customer participation and interactivity. The model accommodates different dimensions of the personal health activities, social network participation, and electronic medical records component. The cyclic nature of the whole dimensions set is captured by the circular layout of the primary activity categories. To simplify the business model, Figure 1 depicts three dimensions design for online healthcare service that is possibly taken into consideration in the process of decomposing e-health scenario. The model extends the role of patients into three distinct functions as individual activities, social interaction, and electronic medical records. Each role comprises of a set of sub classes that details the function and arranging activities within e-health's context between customers of healthcare provider because the modular approach. The advantage of the modular approach is extendible so that new module or sub-module can be easily embedded in the future need of healthcare organizations.

As shown in Figure 3, the model illustrates empowerment in the form of personal, social (networks), and medical. Therefore, healthcare organizations are able to customize in deploying the suitable module according to the need and practices. The yellow circle in sub module indicates that healthcare providers empower patients to have full access over information on that respective sub class, while dashed yellow lines indicates that healthcare providers may only provide partial access to the information like 'for viewing only' and 'no altering'. Finally, no circle line means that healthcare providers do not allow their customers to access any information from the systems.

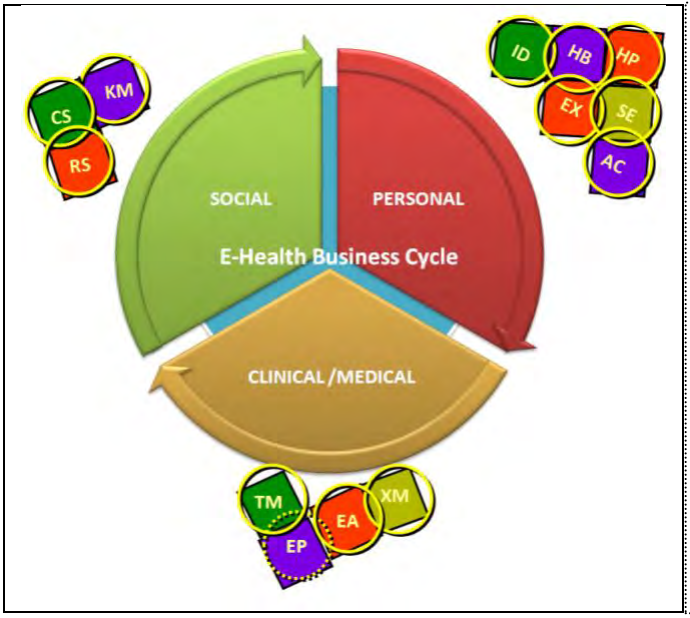
In terms of ability for patients to generate content, patients are able to produce an electronic health records that may help healthcare staffs in comprehensively diagnose a patient based on the generating contents provided by the patients. Nowadays, there are massive smart mobile devices that can records physical exercise and those health records be embedded into personal module in this proposed systems. It is opposite with the conventional e-health system where the ability to generate content is not available to them. The model helps healthcare providers in empowering their patients so that healthcare staffs can get better perspective of health habits from the patients.

Furthermore, the integrated approach can help healthcare organizations in defining which scope of empowerment they will implement in the organization. While, modular approach will assist healthcare organizations to initiate empowerment by stages and later on to measure the empowerment process and performance modularly. The features described in the model were used to develop questionnaires in the survey.

Three types of descriptors used to highlight the central themes that are found throughout the model. First, personal health actor refers to personal health habits that affects individual health status. It consists of Identity/Profile (ID), Personal Habits (HB), Exercise (EX), Emotional and Spiritual (SE), Personal Health Plan (HP), Personal Account (AC), etc. Secondly, the system views customers as social health agents. It refers to customers' activities which are related to social networking, sharing, and supporting group. This involves conversation (CS), knowledge management (KM), and resolution (RS). Third, the core concepts of the system are grounded in sets of principles where patients are medical care partners for e-health services. It consists of modules that encompass activities of checkups, I/P treatment, and O/P treatment. These activities range from e-appointment (EA), examination (XM), treatment (TM), and e-prescription (EP). Each Object also consists of sub-sub classes. For instance, object XM may be made up of chronic disease (cc) and non-chronic disease (NC). A chronic disease comprises of diabetes (DA), cancer (CA), obesity (ob), etc. Object oriented design enabled object to inherit attribute, method, or operation of the child object.

The first role derives function of object class personal where it poses an individual as *a personal health actor* who is exposed to all personal health activities in e-health services, which will directly or indirectly affect their health status, and services. In this category, object class personal consists of objects; personal Identity (ID), personal Habits of patient (HB), Exercise activities (EX), Spiritual and Emotional activities (SE), personal Health Plan (HP), personal Account information (AC), and so on. For instance, ID sets of personal information within the system that contains of personal information such as name, address, phone no, email address, login ID, password, etc. HB is the daily habit of individual such as eating, sleeping, and any other habits that may affect personal health. The EX is the routine exercising activities of an individual that may be a benefit when they are recorded in the systems. All sub classes span in this category as discussed earlier can be empowered fully to the customers. Customers can manage by themselves. The process will replace the conventional approach where the health staffs normally will input patient information into their systems but the customers themselves will do it themselves. Obviously, this is an empowerment of customers where they act as personal health actors for all activities under their own control, in other word, "give them the right what they can do it by themselves".

Figure 3. Source (both picture and table): Author's Compilation



ID: Identity/Profile (Name, Contact, IC No., DoB,etc)
HB: Habits
EX: Exercise
SE: Spiritual / Emotional
HP: Health Plan (My-Update, follow Up, health budget, etc)
AC: Account / Payment / E-Payment / Insurance
EA: E-Appointment / Appointment / Schedule
XM: Examine (laboratory test, diagnosis, Medical History, etc)
TM: Treatment (Disease Management & Recovery, etc)
EP: E- Prescription, Refill
CS: Chatting, Status Conversation, Wikis, Forum
KM: Knowledge Management, Personal Knowledge /Group
RS: Route and Resolve for service, Ask for Specific Service

The second role is object class social where an individual (patient) is posed as a social health agent for others; it is considered as a new service in the e-health systems. Customers are involved in social networks that they share and discuss with others concerning the experience in dealing with the healthcare matters. Customers acting as social health agents provide a broad range of empowerment by accommodating the concept social networks within e-health services. Sub classes in this category are conversation (CS), chat, update status, forum, wikis, blog, knowledge management (KM), personal knowledge, group knowledge, asking for a specific service (RS). CS is standard social network activities such as sharing and conversation in social media. Nowadays, people use social networks daily. Updating one's status in social networks triggers conversation among one's social circle of. Bringing this scenario into e-health services is an interesting issue and is in fact challenging. For instance, patients with the same illness like diabetes may share their experiences with other patients in social networks. Sharing in social networks may become a virtual supporting group that can enrich and strengthen their motivation to fight for better health. In fact, social networks also affect the relationship between healthcare provider and patients. Therefore, adopting social networks in this category is imperative.

Social networks will be useful in the context of healthcare's service. Nowadays, patients shared their experiences about the service received from the hospital to their friends through social networks. As a matter of fact, many healthcare providers failed to understand that the type of relationship, connection, and generated value has changed in dealing with the patients. Patients established communication not only with the hospital by complaining about their dissatisfaction but also with her friends on the social network. Social networking could affect the relationship between healthcare, patients, and society as a whole which may lead to losing trust from the patients in the future. Slow adoption of the social network's model into e-health strategy could jeopardize the healthcare's business process. In summary, patient as the social health agent is a form of empowerment within an e-health system that is important to become a medium of sharing between patients, and patient with healthcare providers to achieve mutual benefits for all parties involved.

The third is medical dimension an individual (patient) poses as *a medical care partner* in the process of healthcare. Sub modules in this section are examined (XM), e-appointment (EA), e-prescription (EP), and e-treatment (TM). XM is an online consultation between patients and medical staffs that can lead to the generation of electronic medical record (EMR) for the patients. It is a common service in any e-health initiative; however, when there is empowerment in these processes of medical activities, the result of e-consultation can be different with the e-health system without empowerment's features. For instance, many healthcare providers prevent patient to access their EMR prior to consultation time. It hinders patients from accessing their medical history. This may imply that whenever a patient needs to make a consultation with a different healthcare provider, the patient will need to go through a redundant diagnosis process. Similarly, whenever a patient visits different doctors for opinions, the patient will explain it all over again from the beginning regarding their symptoms and problems to those different doctors. The aim of e-health as stated by WHO (2005) should educate patients regarding their health status, condition, and history. Therefore, empowerment in the object class medical is pivotal to educate patients and improve awareness of their medical history and status. The EP is another subset of object class medical, which need to be empowered to customers. The EP will speed up the managing of prescription, and customers are aware of what they consume since they are able to access and learn anything relating to their medicine. In summary, object class medical may shift the role of a patient from *recipient of care to partner medical care*. Ability to access knowledge and contents make them a partner for medical care especially in the decision-making process. The next section will further explore each section of object classes.

Personal health cycle

The personal health cycle (PHC) provides a picture of the type of interaction in healthcare organizations. There are three types of interaction in e-health business process. It is interconnected between patient-provider, patient-patient, and the patient alone. Figure 4 explains the business object interaction of the patient alone. Personal daily life is the activities of individual that may affect directly or indirectly to their personal health status.

Figure 4. Personal Health Cycle Source: Author's Configuration

Basic habit

Actors: Patient / Customer (Update, delete, view)

Online Health Educator (view, comment)

Use Case: The basic healthy habit is a data about activities, which is believed to boost chances of a personal healthy lifestyle. This scenario demonstrates the process when a user records or views a recommended activity. The process begins when the request is made. The daily habit workflow records / views the data. Once the data has been stored, it may be retrieved from database. The user may share the data to allow interested parties to display the report.

Exercise activities

Actors: Patient / Customer (Update, delete, view)

Online Health Educator (view, comment)

Use Case: Exercise is a physical activity, which record numbers of minutes/hours, and type of exercise taken routinely to maintain a personal healthy lifestyle. This scenario demonstrates the process when a user record / views an exercise activity. The process begins when the request is made. The daily habit workflow records / views the data. Once the data has been stored, it may be retrieved from database. The user may share the data to allow interested parties to display the report.

Psychological/emotional/spiritual Activities

Actors: Patient / Customer (Update, delete, view)

Online Health Educator (view, comment)

Use Case: Emotional and spiritual are routinely spiritual/emotional activities, which have been performed that affect personal health directly and indirectly. This scenario demonstrates the process when a user produces and records a checklist of those activities. The process begins when the request is made. The user may share the data to allow interested parties to display the report.

Update personal health record

Actors: Patient / Customer (Update, delete, view)

Medical Staff (Update, delete, view)

Online Health Educator (view, comment)

Use Case: Updating health record is self-health assessment activities that an individual may conduct without the help of a health professional (weight, diet, glucose level, etc.). This scenario demonstrates the process when a user does checklists or records of those activities. The process begins when the request is made. Once the data has been stored, it may be retrieved from database. The user may share the data to allow interested parties to display the report.

Follow up

Actors: Patient / Customer (Update, delete, view)

Online Health Educator (view, comment)

Use Case: Follow up / exception is the condition where a user needs to take an action other than the above such as taking medicine, recording health condition (headache, flu, cough, etc.). This scenario demonstrates the process when a user records any extraordinary activities. The process begins when the request is made. The user may share the data to allow interested parties to display the report especially health educator.

Medical care cycle

Figure 5 indicates the medical object interaction between a healthcare provider and patients. The medical care cycle are main activities of medical treatment received by patients? Patients are able to access their medical records anytime and anywhere with the responsibility bound to them.

Figure 5. Clinical and Medical Activities Source: Author's Configuration

Schedule

Actors: Patient / Customer (Update, delete, view)

Use Case: Arrange for online consultation with online health educators. Define which whom one (health educator) would like to discuss; physical, emotional, spiritual. The patient will look free slots in the schedule. They can post queries for a specific doctor. When they find a free slot on the sequence, the patient will invite the doctor to see the patient's profile. Next, the patient will make an Appointment followed by choosing media; text, voice, or video. If the patient needs a procedure, which is not currently available in the clinic because there are no free slots, or because the clinic does not provide such service, the receptionist or the doctor can help to look free slots in other clinics.

Examine

Actors: Online Health Educator (view, comment)

Use Case: The health educator will examine and try to have a complete overview of the patient's profile, health records, medical history, and all related information loaded by the patient, so that the next process will be effective and efficient.

Treatment

Actors: Online Health Educator (view, comment)

Patient / Customer (view)

Use Case: It is a consultation or communication process between patient and health educator. The consultation's notes are recorded, and copies of the consultation are forwarded to the patient's email for future record.

Prescription

Actors: Online Health Educator (view, comment)

Patient / Customer (view)

Use Case: After the consultation session, a health educator may provide a prescription (if necessary). A prescription is written on the prescription note, which will be forwarded to the patient's email.

Referral

Actors: Online Health Educator (view, comment)

Patient / Customer (view)

Use Case: online health educator may issue a *Referral* if the condition of a patient needs further physical assessment. A referral form is completed and forwarded to the patient's email along with results of the online consultation. The Health Educator concern also provides online material, which may be relevant to the current patient's condition.

Social health cycle

Figure 6 shows the cycle of the social life of an individual or patient. Social life refers to the customers 'social activities. Almunawar et al (2015) suggested that healthcare organizations must consider the adoption of social networks in their organization as tools for a strategy to maintain long lasting relationship with their patients, especially in a competitive environment. E-empowerment is considered as a process of conversation and communication through the medium of social networks in which experiences, values, and supports are expressed in informal ways. With the Web 2.0 technologies, all types of interactions can generate conversations and supports that will benefit not only customers but also healthcare providers in creating a strategy for sales, marketing, and customer service.

Figure 6. Social Networks Activities (SNA) Source: Author's Compilation

Sharing and conversation

Actors: Online Health Educator (Update, view, comment, delete)

Patient / Customer (view)

Use Case: tagging, sharing, rating, recommending, relevant resources of interest among members of those communities, using their own patient/community-developed vocabularies and terms they can all understand.

Listening tool

Actors: Online Health Educator (Update, view, comment, delete)

Marketing team (view, comment)

Use Case: actors are capturing messages from conversations that take place in social networks and forums based on their role and objectives. For instance, marketing team captures any concern relating to the services, demands from customers, or any complains raised by customers in social media.

Route

Actors: Online Health Educator (Update, view, comment, delete)
Healthcare staffs (Update, view, comment, delete)

Use Case: actors are passing any relevant messages which are related to healthcare services to the appropriate department for follow up in order to improve services.

Resolve / follow up

Actors: Healthcare staffs (Update, view, comment, delete)

Use Case: actor resolves the problems come from the problem at the conversation in social media.

Referral Handling

Actors: Healthcare management / staffs (Update, view, comment, delete)

Online Health Educator (view, update, comment)

Patient / customers (view, comment)

Use Case: healthcare management /staff responses to the problem raised earlier from the conversation in social media.

Business architecture

Figure 7 summarizes business architecture of the proposed model. It encompasses object class *Personal*, *Social,* and *Medical*. Object class *personal* refers to module Personal Daily Life (PDA). Object class *social* is represented by a module of Social Network Activities (SNA). Finally, the activities of check-ups, outpatient treatment (O/P treatment), and inpatient treatment (I/P treatment) refer to an object class *medical*. In the traditional e-health system, object class *medical* is referred to EMR.

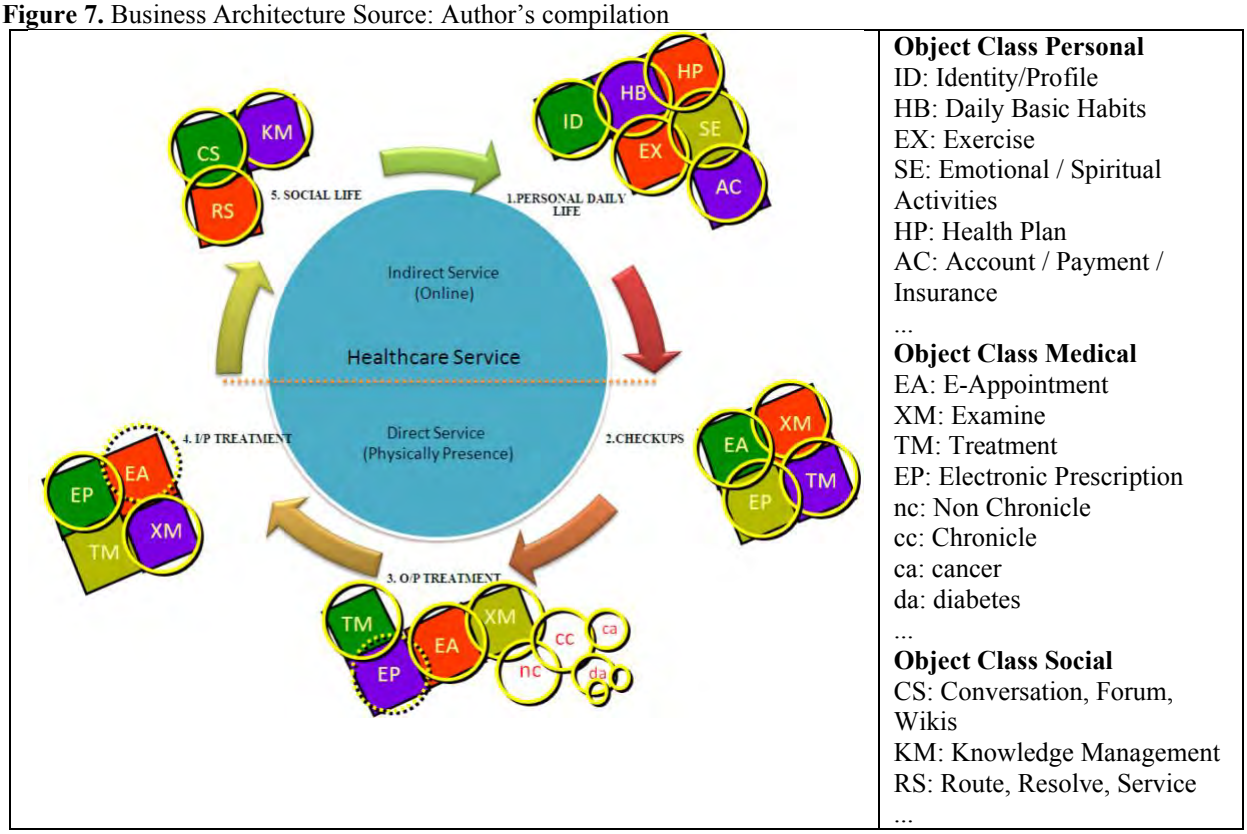
Details of modules and sub modules are highlighted in this section. Object class *personal* consists of objet Identity/Profile (ID), object Personal Habits (HB), object Exercise (EX), Object Emotional and Spiritual (SE), object Personal Health Plan (HP), object Personal Account (AC), and more objects depend on the need and urgency. Object class *Social* consists of all objects related to social networking and media. These are object conversation (CS), object knowledge management (KM), and object resolution (RS). Finally, object *medical* consists of applications that encompass activities of checkups, I/P treatment, and O/P treatment. These activities range from e-appointment (EA), examination (XM), treatment (TM), and e-prescription (EP). Each Object also consists of sub-sub modules. For instance, object XM may be made up of chronic disease (cc) and non-chronic disease (NC). Chronic diseases comprise of diabetes (DA), cancer (CA), obesity (ob), etc. OO design enabled object to inherit attribute, method, or operation of the child object.

The object-oriented framework helps to determine the process of e-empowerment. There are some activities, in this case represented as objects that have embedded *information* and *action* which are able to be delegated to patients/patients' family. For instance, object class *personal* and *social* can be fully empowered to patients/patients' family. However, the object class *medical* cannot fully be empowered to patients /patients' family simply because there must be a mechanism which *information* and *action* can be shared. What are the criteria for authorization for such sharing? What is the level of control that they can perform an *action* for a specific shared-object?

Figure 7 indicates that e-health service is an integrated healthcare activity that governs personal healthcare process in relation with personal, medical, and social. Literally, the model suggests that e-empowerment can be assigned to any object class or at the level of subclass. Yellow circle line in each object indicates that empowerment has been assigned to that object, whereas no circle line means empowerment has not been given. The yellow dashed

lines indicate partial empowerment and participation. For example, a healthcare provider only gives partial authorization to patients to read his/her medical records. The PCEHR in Australia accommodates e-empowerment in level of object class *medical*. The PCEHR allows authorized users to search for records, view records, and access reports. A key feature of the PCEHR System is its ability to provide a series of views over different records in a consumer's PCEHR (Spriggs et al., 2012).

Figure 7. Business Architecture Source: Author's compilation



Furthermore, the model offers a holistic view and mechanism for healthcare providers to provide empowerment to their customers based on a modular approach. However, empowerment in e-health specifically within the object class medical presents a strong barrier for users to adapt into the system.

In summary, the business architecture is developed based on the object-oriented framework and it becomes a central notion of how the study proposes a holistic approach to customer interactivity in e-health. The object classes are arranged in a generalization or inheritance hierarchy that shows the relationship between general and more specific object classes that they can derive many sub-classes from a class. An object communicates with another object by sending messages that will invoke methods to respond. Objects take advantage of having the data and business logic, which is encapsulated within them to interact with legacy applications (Orfali et al., 1996). This makes the system more flexible as it takes advantage of the concept of modularity in software development (Dwivedi et al., 2010).

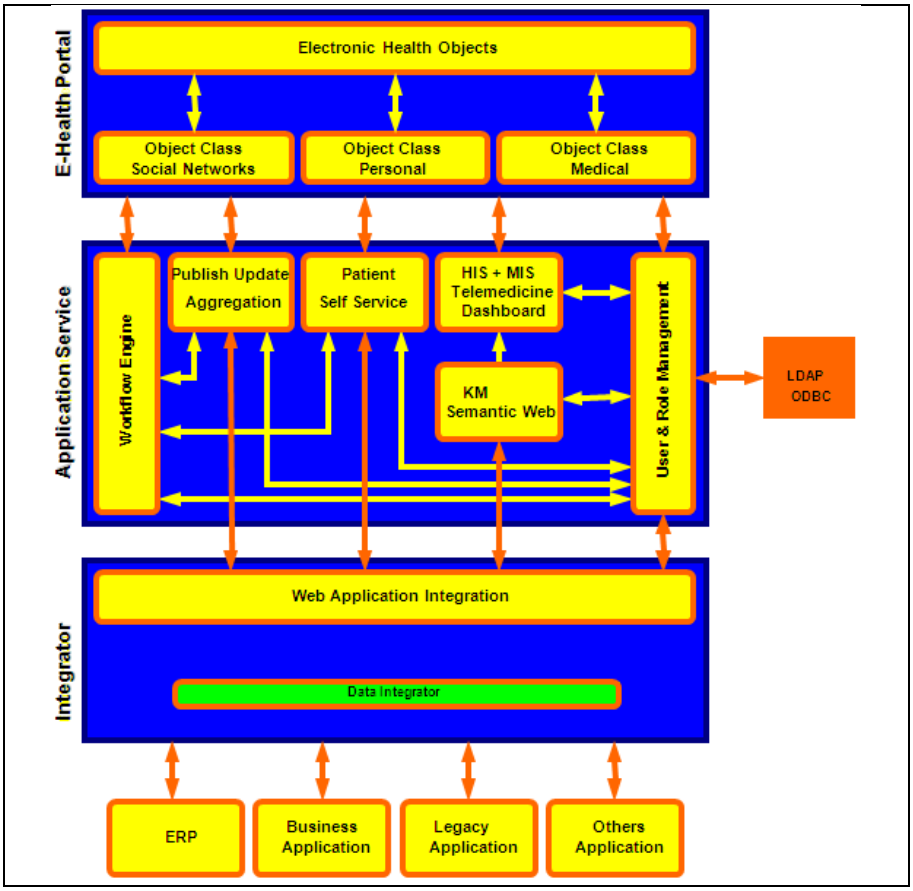
Front – end architecture

The aim of the front-end architecture is to create clear, complete, easy, and friendly user interfaces. These services can be classified into three broad ranges of services, which are offered by object class *medical*, object class *personal* and object class *social* networks respectively. Patients as social agents are incorporated in object class social

networks while the object class personal is for the patient as an individual actor and object class medical is referred to a patient acting as a partner in medical care.

Figure 8 shows the *front-end architecture* of the proposed systems. It views e-health activities as groups of objects with inherent attributes and behaviours (EHO), which enables the users to interact and generate information. E-health's portal governs EHO's business model combining public health promotion, personalized displays the right info to the right users at the right time, customizable sites where users can create custom pages, social networks' platform, and interactive medical information.

Figure 8. Front – End Architecture Source: Author's compilation



From the organizational perspective, an implementation of the Social CRM is proposed to provide a strong foundation to build an integrated e-health system that can incorporate patient empowerment electronically. Application services comprise a range of modular and specialized vertical applications that are tightly integrated into the back-end enterprise system. These applications can run on Web browsers, SMS, and Mobile applications. Based on the proposed model, a healthcare organization will be benefited for implementing social networks with e-health portal front-end solution. The major benefits are the one stop solution for managing customers' relationship, systems availability, reduces infrastructure cost, and no user license required. Healthcare organizations will have the benefit of systems availability of high volume transactions especially for online service and promotion. By implementing Web 2.0 for core business processes, it will reduce cost of network infrastructure, and no user license is required.

CONCLUSION

The study proposes e-health model to accommodate the empowerment and social networks which are operated to achieve a business strategy of a healthcare organization in deploying e-health. The scope of research is customer service that will offer distinct value for each activity especially accommodating customers' participation in the proposed systems. The model accommodates various features and components of empowerment in healthcare systems, as its central role entails self-managed data and authorization to encourage patients to provide full information in relation to their health. This is very important to healthcare organizations as it also enables patients to access more health information.

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INFORMATION PRIVACY AND SOC 2 REPORTING: WHAT ALL SHAREHOLDERS SHOULD KNOW

Marcy Binkley, Lipscomb University
Bart Liddle, Lipscomb University

ABSTRACT

With the explosive usage of big data analytics and cloud computing within healthcare corporations, the communication of effective internal control related to system security, availability, processing integrity, confidentiality and privacy of information to all stakeholders is imperative. As such, this study seeks to answer the following research question: to what extent is a sufficient assurance for privacy protection not currently covered by SOX 404 internal control testing?

The AICPA interpretation of SSAE 18 under AT Section 101 has created the Service Organization Control 2 (SOC 2) report which is an attestation service designed to meet the requirements of a broad range of users that need detailed information and assurance about the controls at a service organization relevant to security, availability, and processing integrity of the systems the service organization uses to process users' data and the confidentiality and privacy of the information processed by these systems. The SOC 2 reporting framework is outlined explicitly in the AICPA Trust Services Criteria. Accordingly, widely-used control frameworks such as COSO, COBIT or auditing publications such as PCAOB Auditing Standard No. 5 (2007) each use certain terminology to determine effectiveness of internal control in accordance with Sarbanes-Oxley Act Section 404. Using automated content analysis, we will utilize a categorized dictionary of terminology used to describe issues related to internal control over information security previously developed in extant literature to compare the terminology in the two frameworks.

This content analysis will help to identify the type of SOX 404 internal controls which provide higher levels of assurance for privacy protection. Areas of overlap between the two frameworks will be systematically categorized by the previously identified 14 internal control categories related to information technology. This use of automated content analysis methodology will also help to identify potential disconnects between control description terminology used in SOC 2 reporting and SOX 404 reporting. These areas of weakness in SOX 404 internal control reporting will be classified by the 14 information technology internal control descriptions as well.

As investors are currently not privy to the information contained in SOC 2 privacy reporting, this study would answer a call from extant research as to needed policies, measures, safeguards and liabilities around cloud computing and data analytics specifically disclosed to all stakeholders. Healthcare corporations, whether providing or requesting a SOC 2 report, are utilizing big data analytics as an imperative addition to sustainable practice. Therefore, in accordance with PHI and HIPPA regulations, the challenges of guaranteeing privacy, safeguarding security and establishing standards and guidance are of uniform significance for healthcare corporations and should be built into SOX 404 internal control framework and risk analysis. Our study will help to clarify best practices in this regard.

ARTIFICIAL INTELLIGENCE IN HEALTHCARE: THE STATE OF THE REPORTED RESEARCH

Michael M. Costello, University of Scranton

ABSTRACT

As a blossoming field of study, artificial intelligence (AI) has become a focus of attention for medical practice and health care service delivery. The highly touted technological capabilities make for fascinating speculation as to how the use of artificial intelligence will improve the provision of clinical services. However, the author's review of existing literature found little evidence of clinical effectiveness resulting from the use of artificial intelligence in medicine and healthcare. While there were some reports of enhanced diagnostic capability, there was no research reported to indicate improved patient outcomes from the use of artificial intelligence and the few reports of documented cost reduction were limited to very narrow applications of artificial intelligence.

Introduction: The rapid development of artificial intelligence (AI) would seem to have tremendous potential to improve human life. Various economic sectors of the world economy are already experiencing phenomenal technological progress as the result of artificial intelligence; however, some experts claim that progress in healthcare is moving at a much slower rate than is found in other economic sectors. Fonnbu (2018) wote: "That's partly because there's resistance from people who don't understand AI …" (p. 8). According to Panesar (2019), AI was first coined as a term in 1956 by Dartmouth College professor John McCarthy who has proposed a research project based upon the idea that "every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it." (p. 2) Some fundamental examples of AI application would be the smartphone texting feature that suggests the next word to be used based upon the words a writer has already placed in a message, an e-commerce platform that suggests items for future purchase based upon the buyer's previous purchases and self-driving technology being developed for trucks and automobiles. Many of the most promising applications of AI would appear to be in diagnostic capability in medical practice and clinical provision of health care service delivery. By creating massive data bases of hundreds of thousands to millions of clinical results, a diagnostician can compare his or her clinical findings in an individual patient encounter to the results in the database. Examples in the existing literature indicate that AI has been shown to improve diagnostic accuracy in cardiology, pathology, psychiatry, dermatology and oncology among other clinical specialties. The research an AI in healthcare appeared to show promising results for diagnostic applications but the author wondered about reported research findings on improved clinical outcomes and cost savings resulting from the use of AI.

Statement of the Problem: Given the rapid development of artificial intelligence in many economic sectors, the author wished to determine the extent to which the secondary source literature reported on documented effectiveness of artificial intelligence in medical practice and health care service delivery. In particular, the author was interested in seeing pre and post comparisons reflecting the introduction of some form of artificial intelligence in medical and health care service interventions. To that end, the author formulated three hypotheses:

H_1 : Does the secondary research literature report on improved diagnostic capability using artificial intelligence?

H_2:Does the secondary research literature report on improved clinical outcomes using artificial intelligence?

H_3: Does the secondary research literature report on cost reduction using artificial intelligence?

The author was looking for clearly articulated quantitative measures of improved diagnostic capability, clinical effectiveness and reduced costs associated with the use of artificial intelligence in medical practice and health care service delivery.

Methodology: In order to construct a sample of relevant literature to review, the author began in August 2019 by using the search tool for Books on Amazon.com and entering the phrase "Artificial Intelligence in Medicine and Healthcare." That phrase yielded seven results which the author considered pertinent for review. The author then constructed a sample of 31 published articles which were selected based upon the title of the article and the author's impression as to whether the title indicated a likelihood that the article might address the specified research questions.

The articles were derived from several sources including a Google search using the same phrase as used in the Amazon search as well as articles selected from the "Notes" section of the book Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again by Eric Topol. This was one of the books revealed through the Amazon search. Selected books and articles are listed under Sources Consulted.

Results: H_1 – In reviewing 38 publications on artificial intelligence, the author found 18 examples of improved diagnostic accuracy using artificial intelligence methodologies, representing slightly less than one example for every two publications reviewed. Of note is the fact that a significant percentage of these reports of diagnostic accuracy were based on research performed in non-clinical settings.

H_2 – The author found no examples of improved clinical outcomes in any of the 38 sources reviewed. In reviewing research results to date, Topol (2019) opined "We simply don't know yet how well AI will be able to predict clinical outcomes" (p.190). As of the date of publication of his book, he writes … no randomized controlled trials have been shown to improve outcomes. Instead the products have largely relied on small retrospective or observational studies. It's a major hole in their stories that needs to get filled in. (p.263) The author has come to much of the same conclusions as Topol. Research must be conducted in clinical settings to evaluate the effectiveness of artificial intelligence in improving clinical outcomes.

H_3 – The information on cost reduction in clinical practice is less definitive than expected. The author found 10 examples of reported cost savings in the 38 publications. However, the reported instances were for very narrow uses of artificial intelligence, and some appeared promotional in nature for vendors or consultants marketing products and services utilizing artificial intelligence in medical practice and healthcare service delivery. Cost reduction would appear to be another area requiring further research, although those efforts may need to await greater integration of artificial intelligence into clinical settings.

Conclusion: Artificial intelligence has been making significant inroads in many sectors of the global economy. Medical practice and health care service delivery are two areas where artificial intelligence would seem to offer great promise for improving clinical patient care. However, a review of published literature through August 2019 reveals relatively few reports of the effectiveness of artificial intelligence in improving clinical outcomes and reducing healthcare costs, two major areas of concern to be addressed by decision makers charged with investment decisions on health system utilization of artificial intelligence in clinical settings. The literature does reveal more information on enhancement of diagnostic capability using artificial intelligence. In order for artificial intelligence to make stronger footholds in clinical applications, data scientists and clinicians will have to devote enhanced effort to documenting improved clinical outcomes and reduced healthcare costs resulting from the use of artificial intelligence.

THE RELATIONSHIP BETWEEN HIPAA AND EVOLVING TECHNOLOGY

Elizabeth Dennis, University of Scranton

ABSTRACT

Healthcare trends reflect technological advancement. This is exhibited in the mass-implementation and updating of Electronic Health Records (EHRs), online billing, use of cloud capabilities, data analytics, patient access portals, secure messaging apps, health-tracking apps, technology companies investing in healthcare, and the other innumerable technology driven innovations. It was estimated that healthcare organizations spent $1.5 trillion on technology in 2018 and will continue to increase investments in the future (VeritechIT, 2018).

Despite rapid change, there is one universal limitation on any group handling healthcare data, The Health Insurance Portability and Accountability Act (HIPAA) of 1996. Healthcare is a unique industry because the "customers" require government protections beyond other industries. HIPAA was designed to protect a patient's personal information in a nationally uniform way. Protected Health Information (PHI) is protected and any organization coming into contact with PHI must be HIPAA compliant.

Therefore, any new technologies developed for healthcare data must be HIPAA compliant as well. The relationship between HIPAA and IT is complicated because IT is rapidly changing and legislation is not capable of keeping up with every specific development in the healthcare industry, despite amendments made to the legislation over the past 22 years. This leaves an interesting dilemma, how are IT developments HIPAA compliant if they have no specific guidelines?

IN THE DEFENSE OF PATIENT HEALTH… AND THEIR PRIVACY: SHAPING HEALTH POLICY IN THE FRAMEWORK OF CYBERSECURITY

Monroe J. Molesky, Alma College

ABSTRACT

In the past decade of American industry, especially healthcare, there has been a surge in technology, devices, and connected systems which are central to the completion of everyday work. Hospitals have seen enormous changes with new technologies that record more data from patients, digitize what used to be done solely on paper, and power almost all healthcare procedures. However, the increasingly "plugged in" healthcare system has created a greater risk to sensitive patient records and essential healthcare systems. In recent years, hackers have taken advantage of the gaps in healthcare cybersecurity and necessity of healthcare information technology systems. Between 2013 and 2017 alone, there were 1512 healthcare data breaches that affected 154.4 million patient records. It is estimated that these breaches cost over $5 billion a year to the healthcare system at almost $408 per affected patient record which doesn't include loss of productivity and reputation. Cybersecurity has been named the number one financial issue for healthcare. This threat is ever present when dozens of large and small hospital systems are held for ransom by hackers slowing down patient care and even threatening lives.

In the push to modernize and innovate in healthcare, consideration of cybersecurity and information privacy has not been a central consideration in health policy development and implementation. In the rush to reduce costs and improve the efficiency of care, such as policies to digitize health records (electronic health records) and medical IoT devices, the security of such nationwide technology rollouts is often varied and the education/training of staff in cyber threat prevention severely limited. In one study, 34% of healthcare professions responded that they never received any type of cybersecurity training in their workplace. The need for cybersecurity and privacy considerations are ever important not only for those clinics affected but at the national level of health IT policy and widespread emerging medical technology.

This presentation will address the need for the consideration of cybersecurity in modern health policy and the steps policy makers/academics can take as innovation puts patients, providers, and major healthcare system's security and privacy at risk.

APPLICATION OF ROGER'S DIFFUSION OF INNOVATIONS THEORY TO HEALTH INFORMATION TECHNOLOGY IMPLEMENTATIONS

Rangarajan Parthasarathy, University of Illinois at Urbana-Champaign

ABSTRACT

Legislations enacted during the past few years in the United States have stimulated the adoption and use of Health Information Technology (HIT). Recent research literature discusses the promise of HIT in delivering high-quality evidence-based healthcare. Indeed, HIT has the potential to improve the efficiency and effectiveness of healthcare, deliver healthcare to rural areas and under-served communities, and make possible real-time health interventions using mobile phones.

HIT is a technology innovation in the realm of healthcare. Considering the fact that certain forms of HIT such as telemedicine have not yet been widely adopted despite their apparent advantages, it is necessary to understand the aspects of HIT that lend themselves to faster adoption and emphasize these while also understanding the aspects that impede adoption and addressing them. Roger's diffusion of innovations theory has been extensively used to study the diffusion, adoption, and use of technology innovations.

This study uses Roger's diffusion of innovations theory to understand the pathways by which HIT is incorporated into healthcare practice and to identify strategies for faster adoption and use of HIT. Results of the study are expected to have value for academicians, researchers, and practitioners alike.

MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE APPLICATIONS IN HEALTHCARE

Jamie Peirce, University of Scranton
Brianna Windsor, University of Scranton
Robert Spinelli, University of Scranton

ABSTRACT

This research focuses on machine learning and artificial intelligence applications in healthcare. Artificial intelligence advancements are happening rapidly, and its uses in healthcare are becoming more widespread. Over the past couple of years, artificial intelligence and machine learning technologies have been developed to help people streamline administrative and clinical health care processes. They span all across the healthcare field, covering areas such as wellness to diagnostics to operational technologies and far more. The rapid improvement in technology is leading to advancements that were once considered science fiction. The role of artificial intelligence and machine learning in administrative and clinical processes will be examined, along with the ethical considerations associated with this innovative technology, and how administrative leaders are viewing this trend in modern healthcare.

LEVERAGING ELECTRONIC HEALTH RECORDS FOR PUBLIC HEALTH IMPROVEMENT

Priyanka Tetali, University of Scranton
Steven Szydlowski, University of Scranton

ABSTRACT

Electronic health records (EHRs), a new health information technology, can reshape public health practice including public health surveillance, disease prevention and control, and policy development. Usage EHR data at HFHS to develop methodologies that can be practically applied to assess the vaccine uptake for health

TRACK

HEALTHCARE MANAGEMENT

THE PROMISES AND PERILS OF HOSPITAL MERGERS

Jonathan Daigle, Monmouth University
Michaeline Skiba, Monmouth University

ABSTRACT

Over the course of several decades, mergers have been regular occurrences within the business sector. Since healthcare is an industry, it is common knowledge that hospitals – for better or worse – have not been immune from this business-driven phenomenon. Utilizing select sources from both the management and financial literature, this paper will briefly examine how and why hospital mergers have occurred and changed, how they have achieved or failed their intended purposes, and some of the potential obstacles that may surface in existing and future healthcare consolidations that include hospitals and other provider groups.

INTRODUCTION

Almost a decade ago, Jonas and Kovner (2011) identified two approaches to ensure the survival of hospitals. The first approach stressed the need to reimburse hospitals for all types of patient care that resulted in payments approximating actual costs. At that time, only "big ticket" procedures such as heart surgeries and technologically advanced interventions represented a small profit versus all other patient care services that incurred losses. Not surprisingly, their second approach was the closing or merging of some hospitals. While they acknowledged the government's role in keeping hospitals open during hospital downturns, these authors also noted how that timeframe's economic environment made such interventions less likely to happen. They cautioned healthcare managers with the following: "Closings – always controversial in a local area – likely will happen, but they can happen responsibly, so that the closure does not threaten the capacity of a community's health system to meet residents' inpatient needs" (Jonas and Kovner, 2011, p. 362-363).

The aforementioned authors could not have predicted what happened only a few years later: both massive and nationwide hospital consolidations and concurrent increases in healthcare costs.

"From 2013 to 2017, nearly 1 in 5 of the nation's 5,500-plus hospitals were acquired or merged with another hospital, according to Irving Levin Associates, a health care analytics firm in Norwalk, Conn." (Findlay, 2018, p. 2). Furthermore, for-profit hospitals will grow more rapidly as they buy both for-profits and non-profits, many of which exist to provide public health services to their communities. "In 2017, 29 for-profit companies bought 11 not-for-profits and 18 for-profit hospitals, according to [another] Irving Levin Associates analysis for Kaiser Health News" (ibid, p. 3).

The current and continued uptick in hospital consolidations fundamentally requires a serious examination of three factors that demonstrate discernible impacts on the delivery of healthcare. These factors are culture, quality, and cost.

Management issues

Culture

Arguably, organizational culture is a factor that is often overlooked or minimized when hospital mergers occur. In most workplaces, an organization's values exert a powerful influence on the ways in which internal

stakeholders (managerial and non-managerial employees, owners) and external stakeholders (current and prospective patients-consumers, constituents within the broader community) perceive and react to organizational change. If individuals' values and organizational values are misaligned, anticipated outcomes may be difficult to achieve. According to one source, the definition of a corporate culture is "a set of values, norms, and artifacts, including ways of solving problems that members (employees of an organization) share" (Ferrell, Fraedrich, Ferrell, 2018, 120). It appears clear that merging two or more healthcare entities creates dramatic and potentially disruptive changes that affect not only employees but also everyone involved in the restructured and larger entity.

McKinsey & Company surveyed 3,199 leaders to learn whether change management programs within their organizations were successful and only one-third of them said that they were (Dewar and Keller, 2009 in Kaetzler, Kordestani, O'Loughlin and Van Oostende, 2019). In a more extensive McKinsey study that examined 10 years of data collected from merger and acquisition (M&A) executives, "…organizational issues like cultural differences and changed operating models account, on average, for almost 50 percent of the failure of mergers to meet expectations" (Kaetzler, Kordestani, O'Loughlin and Van Oostende, 2019, p. 1), and it was noted that executives often do not attend to these issues until they surface after a reorganization takes place.

Executives are primarily concerned about cultural changes affecting productivity and profitability. Realistically, though, the values, norms, artifacts and problem-solving changes as noted earlier and that are affected by a hospital merger can wreak a multitude of problems prior to the achievement of executives' expectations. For example, work-related activities that involve all employees include but are not limited to changes in roles and responsibilities, work processes, reporting structures, and both long-term and short-term decision-making. Apart from work functions, personal and interpersonal ramifications can include stress, anxiety, and emotional detachment from former and new peers and supervisors. Not surprisingly, these behavioral traits potentially erode a sense of trust in leadership, affect turnover, and influence external stakeholders' perceptions of the new/combined organization.

Decades ago, an article entitled "Surviving a Merger" appeared in the journal *Nursing*. At that time, hospital mergers consisted mostly of one hospital merging with another one versus the more complex, multitiered hospital system structures that have evolved since that time. The authors suggested a number of ways that employees could use to minimize stress, and these included keeping a journal of personal thoughts and feelings; taking care of yourself by finding and giving support to others; and acknowledging the culture changes (Katz and Clemons, 1995). As will be seen in the next sections of this paper, most of this well-intentioned advice has become increasingly more difficult to follow as hospital mergers have included more than hospitals.

Quality

According to various doctors, attorneys and academicians, bigger may not be better and better quality of patient care is questionable. Although some hospital CEOs and Presidents tout the promises of lowered costs and improved care as results of hospital mergers, others offer compelling evidence to the contrary.

For several years, the trend toward vertical healthcare mergers has escalated. Frakt cited a 2012 research literature study conducted under the aegis of the Robert Wood Johnson Foundation. The study found that, in general, "…hospital consolidation leads to higher prices (often exceeding 20% in very concentrated markets) and reduces quality" (Frakt, 2015, p. 345). Two years later, the same Foundation published a report to Congress that stressed how healthcare regulations have affected physicians' practice choices. Citing Medicare reimbursement regulations, the report explained how hospital physicians who are employed and practice in hospital outpatient departments receive much higher payments than physicians practicing independently in their own offices (Robert Wood Johnson Foundation, 2014).

Similarly, other researchers have found that hospitals have increased their number of employed physicians in certain specialties to take advantage of Medicare's discounted outpatient drug pricing for qualifying entities (Desai and McWilliams, 2018). In an examination of physician practices acquired in hospital acquisitions, other researchers found an average 14.1% increase in pricing for services provided post-acquisition. In addition, "price increases are larger when the acquiring hospital has a larger share of its inpatient market" and "…integration of primary care physicians increases enrollee spending by 4.9%" (Capps, Dranove and Ody, 2018, p. __). How and to what extent these physician arrangements continue to positively or negatively affect the quality of and access to clinical care and treatment options for patients-consumers remains questionable.

In addition to the absorption of physician groups, the vertical merger trend can also include the acquisition of large pharmacy chains and pharmacy benefit management (PBM) companies, and this activity raises concerns. Does the sheer market power of a vertically integrated healthcare provider affect the quality of pharmaceutical treatments that patients-consumers receive? One researcher has a partial answer as follows: "a pharmacy chain could develop formularies for rivals that do not include important drugs that are in demand by their subscribers or offer pharmacy networks that do not provide important pharmaceutical distribution options to rival subscribers" (Greaney, 2018, p. 920). Thus, financial or physical access to certain medications can potentially inhibit treatment and recovery outcomes for patients-consumers.

A recent study from Rice University's Baker Institute for Public Policy showed that there were little to no improvements in care quality after a vertical merger. The study's data were gleaned from the CMS Hospital Compare database on more than 4,400 hospitals from 2008 to 2015, and for the majority of quality of care measures, physician-hospital integrations did not improve these measures. One of the authors of the study, Vivian Ho, James A. Baker III Institute Chair in Health Economics and Director of the Institute's Center, stated that "The government requires that hospitals report on a wide variety of quality measures, such as practice of preventive care for surgical patients, whether their doctor or nurse communicated well, or whether the patient would recommend the hospital to others" (LaPointe, 2019, p. 1). The lowest rated measure in this study was patient satisfaction. Marah Short, Associate Director of the Institute's Center for Health and Biosciences and a co-author of the study, explained this rating as follows: "Although better patient experience may not always correlate with higher clinical quality, measuring quality based on patient perception is increasingly important as more consumers use online physician ratings and reviews of patient experience to select providers" (ibid, p. 1).

The closure of rural hospitals is another concern related to the quality of care (and access) conundrum. According to the U.S. Government Accountability Office (GAO), 64 rural hospitals closed from 2013 through 2017, representing approximately three percent of all rural hospitals in 2013 and more than twice the number of closures of the prior five-year period (U.S. Government Accountability Office, 2018). As vertical mergers continue to consolidate more medically-related entities in suburban and metropolitan locations, one wonders how rural patients-consumers – many of whom are poor Medicare and Medicaid recipients – will be treated.

Financial issues

Costs

Economies of scale have the potential to greatly reduce operating costs. However, the reduction in costs does not necessarily translate to price decreases for patients. Unfortunately, the literature documents a lack of correlation between hospital systems and pricing. Melnick and Keeler (2007) find this relation when they study the price trends of California hospitals during 1999-2003 period. They observe hospitals systems are more likely to raise prices relative to independent hospitals. Hospitals within large (small) systems increase their prices by 34% (17%) relative to independent hospitals. Cooper et al. (2018) expand upon Melnick and Keller by examining the effects of market concentration on hospital prices across the entire United States. They observe monopoly hospitals (as measure by Herfindahl-Hirschman index) have prices that are 12% higher than markets with four or more competitors.

Studies focusing on merger activity find similar results. In the same study, Cooper et al. analyze 366 mergers and acquisitions over the 2007-2011 period. They observe mergers result in a 6% price increase when merging hospitals are within 5 miles of each other, but not when they are 25 miles or further apart. In a similar vein, Dafny et al. (2019) study the effect of hospital mergers over the 1996-2012 period. Their results indicate acquirers raise their own prices and quality improvements are not the source of the increase. Dafny et al., like Cooper et al., find the price effects are largest when the merging hospitals are in close proximity (30-90 minutes' drive) with each other. More recently, the National Council on Compensation Insurance (NCCI) tracked the price results of recent hospital and hospital system mergers. Their study indicates hospital mergers result in average price growth of 6%-18% for hospital services.

More disturbingly, mergers can have negative price consequences for areas that do not experience merger activity. Schmitt (2018) observes a notable spillover effect for hospital system mergers. Mergers that increase multimarket contact between two hospitals systems result in price increases of 6% for *markets where the merger did not occur*. As an illustrative example, imagine there are three hospital systems: Acquirer, Target, and Idle. Prior to the acquisition, Acquirer operates in Market 1, Target operates in Market 2, and Idle operates in Markets 1 and 2. After Acquirer takes over Target, Acquirer now operates in both Markets 1 and 2 with Idle. Schmitt finds the hospitals in Market 1, where there was no market change, experiences the 6% price increase due to the market consolidation in the other region. Consequently, this finding is highly frightening during this period of increased merger activity.

CONCLUSION

It appears clear that vertical consolidations will continue to occur across the U.S. healthcare delivery system. In this paper, the authors have not explored the influence of governmental and political decisions that, in recent years, have not attended to the diminishment of antitrust laws, changes in federal versus state regulations, and, perhaps most importantly, the continued enforcement of the Affordable Care Act. Indeed, in an election year, alternative forms of healthcare delivery could influence the ways in which these consolidations are structured and administered. Regardless of these and a myriad of other factors, solid evidence must be made available to prove that current and future mergers deliver what they promise – namely, clear communications, quality care outcomes, and reduced costs.

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THE IMPACT OF RURAL HOSPITALS CLOSURES AND CLINICAL STAFF SHORTAGES ON ACCESS TO QUALITY HEALTH CARE IN RURAL AMERICA: ISSUES AND STRATEGIES FOR IMPROVEMENT

Solomon J. Yniguez, University of Houston – Clear Lake
Ashish Chandra, University of Houston – Clear Lake

ABSTRACT

Providing access to quality healthcare to rural population is an increasingly critical issue. This paper will provide insights into the current issues that make providing high quality rural health care difficult. Several case studies are discussed to not only reiterates how the loss of access to care has impacted the rural population, but there are some success and innovative stories as well. Special attention was paid to the issue of clinical staff shortages in rural areas. Strategies for improvement of this issue as well as recommendations are provided to enhance recruitment and retention of clinical staff for the rural communities.

INTRODUCTION

The United States is currently facing a significant problem in providing adequate access to quality and at several locations even the most basic clinical health care for its rural population. Shortages in available clinical staff across the nation further handicaps health care providers' ability to provide the consistent and high-quality care that rural population needs as a basic health service security. Before the authors provide some strategies for improvement to address this critical issue, it is imperative to get a greater understanding of the factors that are contribute to this issues, such as rural hospital closures

Rural hospital closures

A rising trend of closures

One of the critical issues that is disrupting the availability and supply of health care professionals in rural environments is the increasing trend of rural hospital closures. Rural hospitals are closing in greater and greater numbers as they attempt to provide services in one of the most challenging market environments. The Cecil G. Sheps Center for Health Services Research out of the University of North Carolina at Chapel Hill reports that since 2005, 155 rural hospitals have closed in the United States. An analysis by David Mosley and Daniel DeBehnke (2019) showed that of the surviving rural hospitals in operation, fully 21%, or 430, are at high-risk of closing. A hospital was determined to be at high-risk for closure based on a weighted score of three-year low total operating margin, below 1.4%, low days cash on hand, less than 78.5 days, and high debt to capitalization ratio, above 49.8%. These high-risk facilities represent approximately 150,000 employees, 21,547 staffed beds, and over 700,000 annual discharges (Mosley and DeBehnke 2019).

Contributing factors

The reasons for these rural hospital closures are often complex, but several critical factors have been identified. The population that these organizations serve does not look like the populations that are served by their urban counterparts. Rural populations tend to be older, have less insurance coverage and/or are more dependent on Medicare/Medicaid, struggle with more chronic diseases which are more expensive to treat, and be more likely to live close to, at, or under the poverty line (Meit, et al. 2014). This particular population mix means that costs run high and reimbursement runs low, which then snowballs into reduced resources for infrastructure improvement and

payroll. This would trigger a process for many of the hospitals, and especially those with relatively nearby urban/suburban competition, entering a death spiral. While this is not characteristic of the majority of rural hospitals, it has been identified as a common and persistent threat to their success.

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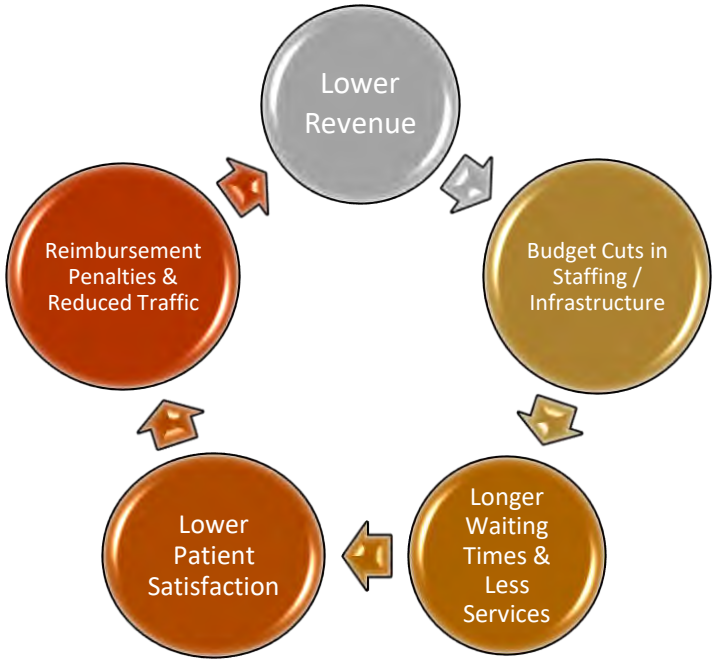


The impact of rural hospital closures

A decline in immediate & long-term health

The loss of a local rural hospital can be, and often is, a huge blow to a rural community. The most immediate concern for many in a rural community that has just lost its local hospital is the loss of the emergency department. Ambulance transportation times to the nearest emergency department can dramatically increase, even double, when a rural hospital closes (Troske and Davis, 2019). These lengthier emergency response times were shown to be strongly correlated to increased mortality rates in a study of emergency responses to car crashes in rural versus urban Alabama. (Gonzales, et al., 2009). For many in rural communities that have lost their local emergency room, extremely time sensitive health emergencies, such as stroke, cardiac arrest, and severe physical trauma will cost them their lives.

Increasing the distance between facilities doesn't just affect emergency transportation times, it also tends to increase the burden of travel for those requiring non-emergency medical services. Studies have shown that such increases in non-emergency travel times suppress consumption of medical services, such as seeing physicians,

accessing medications, or even staying compliant with treatment protocols (Syed, Gerber, and Sharp, 2013). Low-income populations with more limited transportation options were especially shown to be vulnerable to these transportation barriers. Recalling that rural populations generally have greater numbers of low-income community members and higher incidents of certain chronic diseases; driving down the consumption of health care services will and has had dire consequences for the health of rurally located individuals.

Serious financial risks for individuals

Rural communities will not only feel the health repercussions of vanishing rural hospitals, but the economic consequences as well. Rural populations are increasingly relying on air ambulances for emergency medical transport. These vehicles are able to reach remote patients quickly and get them the help they would otherwise not have access to, but the often life or death consequences of the medical emergencies they respond to means that rurally based individuals are in a dangerous financial position when such expensive services are the only option. These costs have been proven to be extreme. According to a report by the United States Government Accountability Office (2019), in 2017 the median price of an air ambulance helicopter ride was $36,400. This report also found that fully 69% of these emergency transports were not in-network for privately insured individuals, and even if they were, there is no way to guarantee that an air ambulance in your network will be the one responding to your emergency. Some of the highest socioeconomic status members of rural communities face the greatest risk of financial ruin from a single medical emergency when their access to nearby emergency care is lost.

Tearing a hole in a community's economy

Rural hospitals are also critical employers for many communities, providing some of the highest skilled and highest payed jobs. While the local context played a significant role, one study showed that rural hospitals have a multiplicative effect on the employment numbers and labor income of the community at large (Eilrich, Doekson, & St. Clair, 2015). The staff at a rural hospital become vital consumers of goods and services in their community, circulating their income through local businesses. Businesses that offer more luxury goods and services, such as restaurants and entertainment venues are dependent on a stable population with higher levels of income, which is provided by the hospital. Each hospital will have a differing scale of impact on the surrounding community, but it is clear that these institutions and their employees have more than a small impact on the surrounding economy.

Case study 1:

A case study from that report showed that one rural hospital in Bamberg County, South Carolina, was calculated to have an employment multiplier of 1.35. This means that for every 100 jobs that were provided directly by the hospital, 35 were created around the hospital to service their staff. Just as those 100 jobs provided directly by the hospital created 35 additional jobs in the community, so too are those jobs lost if the hospital closes. This effect was also observed in total wages earned by the community. The hospital provided a 1.21 multiplicative affect to wages earned, meaning that when the hospital closed and took $2,722,349 in direct annual wages out of the community, the surrounding community lost $571,693 in annual wages (Eilrich, Doekson, & St. Clair, 2015).

Not all news is bad news - rural hospital success & growth. Individual hospital initiatives:

Making Community Engagement a Priority

While it is true that many rural hospitals are struggling to stay open in these challenging environments, some have found ways to not only survive, but thrive. One of the central elements to rural hospitals that have successfully adapted to their market is community integration. Several rural hospital CEO's have found great success and brought their facilities back from the edge of disaster by recognizing that in order to serve a rural community, there needs to be trust and involvement (Pryor, 2019). Such trust is not solely built on the reputation of the institution as a purveyor of high-quality health care services, but through involvement in the regular activities of the community at large. Everything from ensuring that hospital employees, and especially the physicians and leadership are present for sporting events and even participating in local special events, such as handing out hearing

protection for tractor pulls and monster truck rallies contributes to a rural community engaging with the local health care providers when it is time to seek care. While such activities may hardly seem to be a silver bullet for a financially stressed hospital, the gains can be significant.

The following two case are examples that demonstrates how community engagement can change how a rural hospital functions and survives. In a fight for every billable service, low-cost strategies which strengthen the bond between the community and the hospital cannot be ignored.

Case study 2:

One rural hospital in Holyoke, Colorado saw a 42% increase in brand recognition following the arrival of a new CEO, Trampas Hutches, that made community involvement a priority (Pryor, 2019). This new CEO is an elected member of the local school board, attends local sporting events, Booster club meetings, Lions club meetings, and fundraisers. Personal involvement from hospital leadership in community living demonstrates that the hospital is part of the community at every level, and is not just another business. In a fight for every billable service, low-cost strategies which strengthen the bond between the community and the hospital cannot be ignored.

Case study 3:

Kittitas Valley Health in Ellensburg Washington has found success in community engagement by hosting regular community dinner events in which rotating groups of local residents are invited to share a meal with hospital staff and leadership. This presents an opportunity for community members to learn about the hospital, what it offers in terms of services and community value, as well as reinforces the investment they have in the hospital as a staple of the wider community. The hospital has noted an increase in reaching segments of the population they would not have normally been able to reach, and improving broad community support (Washington State Hospital Association, 2014).

Tailoring Services to the Population

Improving public relations isn't the only strategy for strengthening the health and viability of rural hospitals. An important factor for successful rural hospitals has been to tailor their services to the population around them. For rural hospitals serving areas with significantly higher populations of older adults, strategic partnerships with surrounding nursing facilities and retirement homes, combined with greater investment in orthopedic specialists and surgical services have become cornerstones in developing stable sources of revenue (Pryor, 2018). Being present in the community and ensuring that available services are targeted towards community needs rather than taking a generalist approach can make the difference in whether or not a rural hospital survives.

Collaborative hospital approaches

Population Health & Community Partnerships

For some rural hospitals, taking a public health approach and targeting the population as a whole rather than on purely focusing on individual acute issues has been a path to stability. Small rural hospitals that have recognized that they can play a much bigger role in the overall health of the community were able to expand their range of services to offer additional health and wellness programs, such as anti-smoking, physical activity, and mental health initiatives to name a few. As an indicator of how much room there is for these hospitals to expand in the arena of influencing population health outcomes, the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute (2014) introduced a model of ranking rural county health, and indicated that access to clinical care only accounted for 20% of the overall influencing factors that impact a population's health.

Incorporating Telehealth Programs

One of the most common adaptations of technology is the rise in implementation of telehealth programs, especially as both private businesses, charitable groups, and government programs come together to help equip rural hospitals with the appropriate funds and infrastructure to implement such programs. One such initiative established a grant of $22 million allocated to 85 rural hospitals in the Midwest, and to implement a telehealth 'eEmergency' program to supplement existing emergency departments. Between 2009 and 2011, the eEmergency telehealth program was able to prevent upwards of 1,200 unnecessary hospital transfers at an estimated $9.8 million in savings (Stingley, & Schultz 2014). Significant improvements were also seen in quality of care, as an example, patients exhibiting chest pain in the emergency department were more than twice as likely to receive aspirin prior to discharge if they were seen by a telehealth emergency physician over an emergency physician in person. Patients were also seen an average of 10 minutes faster by a physician through the eEmergency program then by a physician in person (Stingley, & Schultz 2014).

Funding Telehealth Programs

While some significant barriers do exist for establishing and executing telehealth programs, rural hospitals do not necessarily have to overcome these barriers alone. Public funding is available through grants from the Department of Agriculture, Centers for Medicare and Medicaid Services, as well as the Health Resources & Services Administration (Stingley, & Schultz 2014). Private interests like the Verizon Foundation, as well as charitable foundations and non-profits with interests as broad as public health, and as narrow as specific disease focuses have collaborated with rural hospitals to build and maintain the often-lacking broadband infrastructure common to rural and remote regions (Stingley, & Schultz 2014).

Organizational hospital adaptations:

The "Hub and Spoke" Model

Some rural hospitals have also been able to improve their viability by collaborating with or becoming part of other health care institutions. One such model for operation is the "Hub and Spoke" system. In the "Hub and Spoke" system, a centralized health care institution provides care for the most intensive or complex needs, while smaller satellite health care providers offer services to address the more basic or routine needs in a particular area. The smaller satellite providers have a more streamlined process for sending patients with complex needs to an appropriately equipped provider, allowing for a reduction in unnecessary duplication of services, and reduced complications resulting from disjointed policy interactions as two or more health care providers provide services for a single patient.

Rural hospitals have integrated into the "Hub and Spoke" system as both the centralized "Hub", improving their patient volume by collaborating with surrounding physician practices over wide sparsely populated areas, as well as functioning as a spoke for a larger health system in a nearby urban area. Becoming a successful spoke of a larger urban health care system doesn't necessarily involve losing total control or local ownership for the rural hospital either. Having already established a successful hub and spoke model in Shreveport, Louisiana, Willis-Knighton Health System was able to incorporate the struggling rural DeSoto General Hospital in 1983. The non-profit DeSoto hospital was able to consolidate its service offerings, receive significant infrastructure upgrades, maintain local ownership, and become financially stable through its partnership (Elrod & Fortenberry, 2017).

Independent Hospital Network Model

Rural hospitals have also been able to make significant improvements to their operations and viability through collaboration with other rural hospitals rather than with larger urban health systems. One such example is The Hospital Cooperative, a network of critical access hospitals in Idaho. These critical access hospitals were unable to purchase their own MRI unit, but by pooling resources between them, were able to purchase a mobile MRI unit. The unit travels between the member hospitals multiple times a week, allowing the hospitals to offer quality imaging services locally, and has largely been a success for all members, providing hundreds of scans a month (Rural Health Information Hub, 2012). This represented a significant boost to both the hospitals, which were able to expand their

service offerings, and individuals who did not have to travel long distances to urban facilities to access needed imaging services.

In West Virginia, a network of 35 hospitals, community medical centers, federally qualified health centers, and free clinics have joined together to form a non-profit network that communally handles credentialing, a time and financially intensive process, and offers a care coordination database (Rural Health Information Hub, 2019). This network, called the "*Partners in Health Network*" significantly reduces administrative burdens for member organizations like the Charleston Area Medical Center (CAMC), Monroe Health Center, and Montgomery General Hospital. It also facilitates collaborative care through ease of data transfer/access as well as allows for significantly easier credentialing of physicians across multiple facilities. This has allowed for improvements in continuity of care and at a lower cost, further improving the viability and sustainability of the member institutions as well as significant broadening of public health initiatives through data sharing and collaboration. One such initiative is the Appalachian Pulmonary Health Project which is led by the "*Partners in Health Network*" and stretches across West Virginia, Kentucky, and North Carolina (Partners in Health Network, 2019).

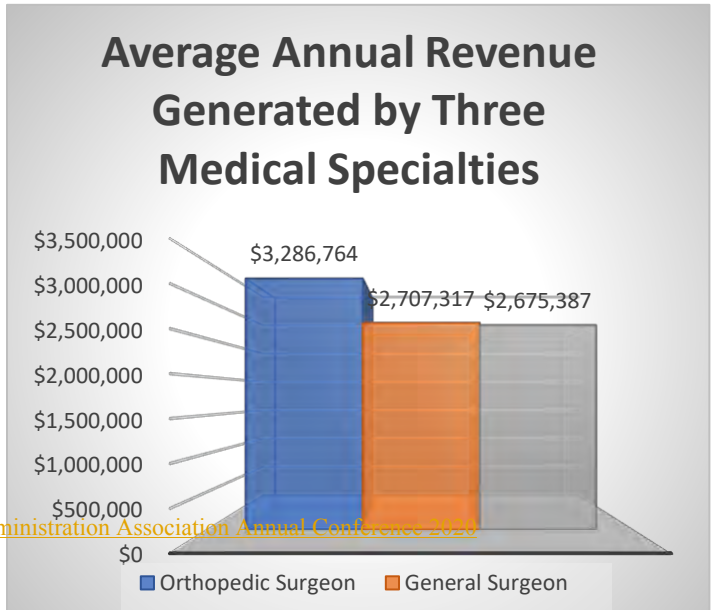
Rural clinical health care staffing:

Demand Outgrowing Supply

According to a report submitted to the Association of American Medical Colleges (IHS Markit 2017), modern demand for health care and health care providers is accelerating quickly, driven heavily by the large cohort of baby boomers that are aging into retirement. Supply is largely failing to keep up, and the gulf is widening as time goes on. It is estimated that by 2030, the overall national supply of primary care physicians will fall short of demand by between 7,300 and 43,100. The shortfall for non-primary care specialists is even greater with a predicted deficit of between 33,500 and 61,800 full time equivalents by 2030. Such a wide range in estimates allows for varying scenarios which take into account factors that dramatically impact both sides of supply and demand, such as the rapidly expanding elderly population, changes in the Affordable Care Act, changes in barriers to health care utilization for underserved populations, and physician retirement age trends (IHS Markit, 2017). This same study also indicates that demand could rise significantly, pushing the disparity between supply and demand to a greater extreme, particularly if underserved rural populations achieve similar health care consumption rates as their urban counterparts.

The Cost of Consistent Vacancies & Recruitment

With such a gap in the market overall, rural health care providers are especially struggling to fill their departments. One national survey revealed that 75% of rural hospital CEO's reported physician shortages, and 70% of them reported shortages of 2 or more primary care specialties (MacDowell, Glasser, Fitts, Nielson, & Hunsaker 2010). Having a physician vacancy is no small problem, and while payroll is often one of the largest expenses for employers of physicians, the costs associated with missed direct and indirect revenue from a physician vacancy can run into the millions (Merritt Hawkins, 2019).



The costs associated with recruitment can also weigh heavily upon a clinical health care employer, and the longer they spend recruiting, the greater the costs to the organization will be. While the costs of recruiting a physician can vary wildly depending on several factors, such as specialty, location, and interviewing practices, a national average cost of recruitment for a physician sits at approximately $342,000 including the physician's salary and benefits (Merritt Hawkins, 2019). Constant rolling vacancies can also obscure the total costs of recruitment as the recruitment process never stops, it simply changes targets. A strong understanding of the barriers to clinical health care personnel recruitment and retention will be necessary in order to develop effective strategies for establishing an adequate and sustainable rural clinical health care workforce.

Factors affecting health care professional choice

Background & early experiences

Significant effort by American and international groups has been made to identify what factors contribute to a physician's choice to practice in an urban or rural environment. What has been identified is that there are a few categories that appear to be principally responsible; rural vs. urban background, experience in a rural training program while in medical school or residency, and whether or not to specialize or pursue general practitioner status. Specialization often precludes rural practice as job availability is currently significantly limited for medical specialists in these areas (Hempel et al. 2015). This combined with the significantly higher earning potential of medical specialists over general practitioners in urban environments has contributed to family medicine practitioners being 2.65 times more likely to choose a rural environment than a medical specialist (Hempel et al. 2015).

One of the strongest positive predictors for a physician to choose rural health care is having come from a rural background. It was found in a report for the Department of Veterans Affairs that 70% of currently practicing rural health care providers had a rural background, with significant associations between attending rural or non-urban high schools and selecting a rural area for practice. Having a familiarity with rural living appears to contribute to suitability of job fit, and having first hand experience in observing the needs of a rural community from a young age both appear to help prepare clinical aspirants for service in rural environments (Hempel et al. 2015).

Perceptions of Practice in Rural Communities

One of the contributing issues that has been identified which significantly influences where a clinical health care professional chooses to practice is their perception, realistic or not, of what it is like to be a rural or urban practitioner. These issues are not an issue for the United States only. A focus group study in Germany looked at how general practitioners viewed their role as a health care provider and their relationship to patients (Pohontsch, et al., 2018). The study found that urban practitioners viewed themselves more as service providers. They fulfilled a role in providing a customer with a needed service or access to a needed good. The rural physicians were more inclined to view themselves as health care partners with their patients, collaborating with them on how to lead healthier lives. Of significant concern to urban physician respondents was the notion that rural patients would have 24-hour access to their physician and significant privacy issues were likely to occur as a result of small town or rural living. The rural physicians indicated that the elevated amount of contact with their patients created a stronger bond with their patients, and reported this a positive aspect of their practice.

Educational Interventions

Efforts to improve on the supply of rural clinical health care professionals by creating rural training and experience programs in medical schools have demonstrated success both in the American context and abroad (Strasser, 2016). One such rural training program in Pennsylvania, the Physician Shortage Area Program, demonstrated that participating medical students were nearly 10 times more likely to end up practicing in a rural environment, and these students were much more widely distributed across Pennsylvania than their peers that did

not participate (Rabinowitz, et al., 2011). For many students and young physicians, rural practice may never have crossed their minds, an out of sight, out of mind problem. By exposing these aspiring physicians to the challenges and benefits of rural practice, many that would not have normally considered it are choosing this environment for practice.

Current *recruitment* strategies for rural clinical health care staff

Loan forgiveness & scholarships

One of the most well-known initiatives to get clinical staff into underserved rural areas is the establishment of loan forgiveness programs. These programs, often state funded, provide recent medical school graduates and new physicians with incentives to work in rural areas for a predetermined amount of time in exchange for partial or full relief of school debt burden. There is significant evidence that these programs attract a sizeable number of physicians to practice in underserved areas (Pathman, Konrad, King, Taylor, & Koch, 2004). These loan forgiveness and scholarship programs help to alleviate that burden and both incentivize clinical health care professionals to practice in rural areas, and expose them to the great need for high quality care that is felt in those areas. These loan forgiveness programs are also helpful for injecting young physicians that are in the earlier stages of their career into rural areas, potentially creating a full career long placement.

International recruitment

Foreign recruitment is also a popular strategy to place clinicians into underserved areas, although the efficacy of these programs shows mixed results. Special visa programs authorized by the United States Citizenship and Immigration Services, such as the Conrad 30 program, attempt to bolster the number of practicing physicians in underserved rural areas by offering the opportunity to live and practice in the United States. While these programs have had some success, the overall impact appears mild to negligible, with the percentage of international medical graduates practicing in rural environments hovering at approximately 2% (Fink, et al., 2003). This would be about the same rate that United States medical graduates choose rural practice, indicating that international clinicians are no more likely to choose a rural setting than clinicians from the United States.

Trait/character based recruiting

What appears to be most interesting in terms of current clinical rural recruitment is that financial incentives, while important, do not appear to be the sole, or even primary in many cases, motivating factor for clinicians who choose to practice in rural environments (Misfeldt et al., 2014). Many rural hospitals and health care providers appear to be struggling to attract physicians to their staff on the basis of being unable to compete with urban market incentive packages, while also not marketing the valuable, yet not directly financial, aspects of what makes practicing as part of their staff attractive. Alternative recruitment strategies that combine financial incentives with marketing of peripheral benefits/qualities appear to be few and far between, with successful strategies appearing as experimental outliers rather than broadly instituted strategies.

Case study 4:

One such outlier comes from the CEO of Ashland Health Center in rural Kansas. The CEO recognized that one of the qualities that drives clinicians to practice in underserved areas is a passion for helping people in resource poor areas. As part of his recruitment strategy, the CEO offered 10 weeks of paid leave to physicians that would volunteer their services anywhere in the world. This recognition of what rural physicians are more likely to value resulted in the recruitment of 12 new physicians in 3 years (Brown, 2018).

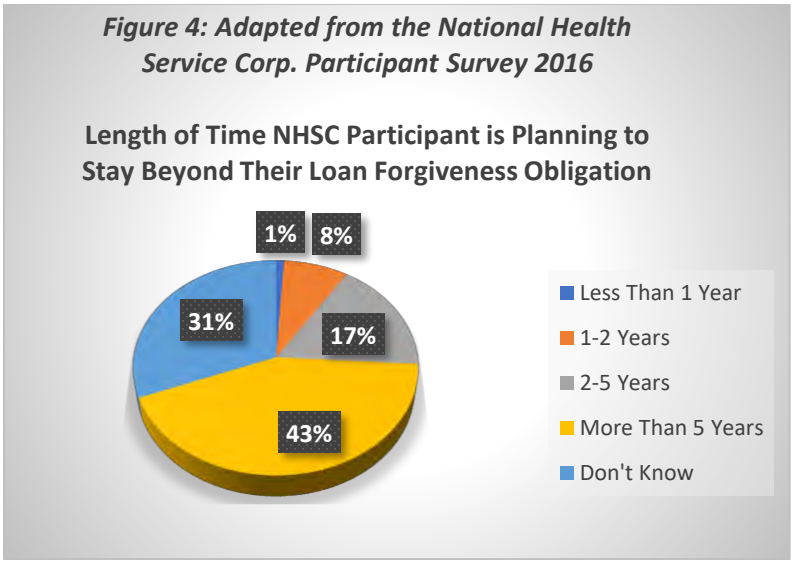
Current retention strategies for rural clinical health care staff

It is also important to recognize the distinction between recruitment strategies and retention strategies. The two primary retention strategies appear to be oriented around aggressively pursuing physicians who already have a

background in rural practice, as well as building out and participating in educational programs to introduce medical students and new residents to rural health care and instilling new physicians with rural experience early in their careers. While sometimes recruiting and retention strategies can overlap, it should not be assumed that a successful recruiting strategy will result in long term employment/staffing solutions. Ensuring that the clinician is prepared and acclimatized to the working environment and overall lifestyle of rural practice and living appears to be vital for positive retention.

As an example, the loan forgiveness and scholarship programs that have demonstrated strong results in recruiting physicians to rural and underserved areas have shown mixed results in creating a long-term rural health care workforce. A 2016 survey of participants in the National Health Service Corp, a federal program offering scholarships and loan repayment to health professionals that agree to provide services in needed areas, revealed that 43% were planning on staying in their area of need for at least 5 years beyond their service agreement (Health Resources Services Administration, 2017). While the program is undeniably productive in increasing the number of rural clinical health care workers, post-program attrition is significant. A greater diversity of retention strategies, oriented around leveraging both local context specific advantages, and more generalized incentives should be implemented to improve long term clinical staffing. Trait analysis of what separates the 43% of long term planning NHSC participants from the other more short-term oriented practitioners could reveal valuable attributes which recruiting rural hospitals and health care providers can focus on.

Figure 4: Adapted from the National Health Service Corp. Participant Survey 2016



PROPOSED STRATEGIES FOR RECRUITMENT AND RETENTION

Enhancing professional development

One area of improvement that has been identified, and is likely in reach for many rural health care employers, is that of offering strong professional development packages. Leaving physicians and nurses on their own to access and acquire continuing education, both for their own professional development and in support of maintaining their licenses, is a missed opportunity that rural employers should be capitalizing on to demonstrate support for their clinicians. Taking the example from the coalition of critical access hospitals that banded together to purchase a mobile MRI unit, regional groups of rural health care institutions should consider taking advantage of group pricing to send their clinicians to regional, national, and international conferences and learning opportunities.

A rotating schedule could be established, allowing rural physicians and nurses to travel together, networking with their regional peers, while also gaining valuable knowledge, and refreshing themselves in new experiences and locations. An institution, especially a non-profit, or coalition of rural health care employers may

even be able to establish a relationship with a particular airline to provide even greater discounts for group travel in support of the clinical staff who care for underserved rural communities. Through this sort of program, a network of rural hospitals can offer the small-town lifestyle while ensuring that clinicians are given a chance to regularly gain new experiences and fresh insights.

Formal mentorship programs

In line with professional development incentives, is the establishment of mentorship programs. Rural practice education programs are growing quickly with the aim of producing new rural physicians and having a support program already in place with the aim of guiding and supporting the clinicians the institution hopes to hire will simultaneously improve the performance of clinicians that are new to rural practice, and communicate to potential hires that the organization is dedicated to their success and well-being. Taking a proactive stance to helping clinicians thrive in the face of the very real challenges that exist in rural health care can go a long way in attracting new clinicians and keeping the ones you hire. This can be especially impactful if the clinical staff that is on hand are long term rural practitioners, leveraging their experience with both the local community and clinical issues. Current staff participation is essential for such a program, and their input into development and structure should be accounted for prior to marketing and instituting the program.

Offering child & adult day care

A higher risk – higher reward strategy suggested would be to offer onsite childcare for clinical employees at either significantly subsidized or zero cost. While investing in an onsite childcare suite can be expensive, with estimations of total costs for starting a day care center, including building renovations to an existing structure, coming out to approximately $100,000 (Gardner, 2018) for a class size of 76 children, the benefits can be significant. For most small rural hospitals, class sizes will be significantly smaller, and so startup costs for a child day care will be significantly less. Employers that have adopted child care benefits have seen improvements in employee recruitment, retention, productivity, satisfaction, and emotional security (Trautner, 2016). Potential savings in initial investments might be had if the operating facility has excess space, such as a hospital floor that is not in use for receiving patients, that can be renovated for day care use.

To differentiate itself, a rural hospital might decide that rather than, or in addition to offering child care services, adult day care may be an attractive offering. It has been discussed in this paper already that many rural areas are home to larger populations of older adults, and if the hospital has already expanded its services to cater to older adults, offering adult day care to the clinical staff for their parents and/or grandparents could heavily incentivize clinicians to join and remain with the organization. By offering this service, the organization can improve its recruiting efforts, making itself more attractive, especially to new parents, dual income earning families, and single parents. The objective is to both provide a valuable service that potential and new employees will not want to part with, but also to develop the clinical staff's roots within the broader community. A cost/benefit analysis may determine whether such a program would be more efficiently run internally taking into account payroll for child and/or adult care workers, including any licensing costs, and liability, or contracting with a third-party care organization to provide services on-site.

Housing

One of the most significant resource intensive strategies that a rural hospital might engage in for recruitment and retention is the provision of clinical staff housing. There are several housing issues which can significantly impact the attractiveness of a rural community for prospective clinicians, as well as impact their retention after they have committed. One of these issues is the commute. Travel distances for patients to rural health centers has already been discussed, but these issues can be just as problematic for the clinical staff if they find themselves living too far from the health center. Long commutes every day can build frustration and drive motivation for in-demand staff to consider alternative employment.

Low availability of housing and instability in the local housing market can also present challenges as clinicians who would otherwise have chosen to live and work in the area seek other opportunities where there is greater availability of high-quality housing. By providing housing for critical employees, a rural hospital can dramatically improve its competitive recruiting edge, drawing in clinicians with similar long-term savings that are offered by scholarship and loan forgiveness plans. This combined with the fact that the hospital does not necessarily have to bear the full cost of acquiring or constructing the housing on its own, as the following case study demonstrates. While a multi-million-dollar housing complex may not be feasible for every rural hospital, a careful investigation of the local housing market for purchasing or development opportunities may make the difference between attracting a new orthopedic surgeon, internal medicine physician, or critically required nursing staff.

Case study 5:

In North Dakota, the McKenzie County Health System constructed a 24-unit apartment building for critical hospital employees in conjunction with a new hospital to serve the expanded population that had grown up around the newly opened oil fields in the area. The apartment project was completed at a cost of $6.3 million dollars, with significant contributions made by Watford City, the State of North Dakota through the North Dakota Housing Incentive Fund, and the Bank of North Dakota (United States Department of Housing and Urban Development, n.d.).

CONCLUSION

While it is clear that not every rural hospital and health care provider is in dire straights or in immediate risk of closure, the rural environment poses unique challenges for health care institutions, and many have struggled to survive because of them. It is also clear that there is a pressing need for not only a stabilization of health care providers, but a significant increase in their number and availability to adequately address the needs of the rural population. When the consequences are as dire as life or death for individuals, and the entire economic futures of some rural communities are tied into the success of their health care providing institutions, significant effort is needed now to improve their viability and increase the number of practicing rural physicians.

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CONCENTRATION IN THE CHICAGO HOSPITAL MARKET

Anthony Paul Andrews, Governors State University

ABSTRACT

Hospital concentration is increasing and their impact on prices (Muchmore, 2019). A recent report by Health Care Costs estimates that 75% of US hospital markets are now designated as "highly concentrated"(Inserro, 2019). Concentration can be considered in a number of ways. The purpose of this paper is to examine hospital market concentration with respect to market share and the Herfindahl Index with respect to revenue and location. Using 2-period data from Crain's Chicago we estimate the change in market and location of hospitals in the Chicago MSA. We assume that locational concentration will identify links to service inequality.

THE IMPACT OF PROVIDER WEBSITES ON PATIENT DECISION MAKING

Rita DiLeo, University of Scranton
Michaelangelo Messina, University of Scranton
William Miller, University of Scranton
Marissa Lembo, University of Scranton

ABSTRACT

It is imperative for health care providers to demonstrate performance excellence through a virtual exposure. Currently, providers use various online strategies to capture consumers' attention, and by analyzing existing approaches, provider specific strategies will be identified that will enhance organizational virtual planning and increase market share. Achieving superiority by leveraging competitive advantage, highlighting recognitions, and eliminating wasteful information is vital from an operational and marketing perspective. By addressing patient questions and concerns through simplified website navigation, providers could 'tip' patient decision making in their favor. This research explores the importance and impact of the patient online experience and reveals current flaws on provider webpages.

HOW TO DESIGN HOSPITAL SETTINGS FOR VISUALLY IMPAIRED PATIENTS

Hengameh Hosseini, University of Scranton

ABSTRACT

Background and significance of the problem: According to the World Health Organization, about 246 million individuals have low vision. What is my project intends to do is determine the accommodations of individuals in hospital settings in Pennsylvania, assessing the feasibility of low vision environment in those healthcare settings, and to determine whether or not regulations by the national LVDC (Low vision Design Committee, established in 2011 by the National Institute of Building Science) are being implemented and followed in hospital settings (in Pennsylvania).

Research Question / Hypothesis: Qualitative data will be collected via structural interviews, with ophthalmologists and other healthcare staff, within participating hospitals. These interviews will collect anonymous data regarding the number of low vision patients at each hospital as well as the staff knowledge of existing low vision-built environment and facility protocols, adherence to these protocols, and the perception of the sustainability of these environmental protocols. Structured surveys will also be distributed to patients, for both in – patient and outpatient services, in order to gain patient perspectives on the low vision accommodations available to them, what these patients need, and what is missing from these low vision-built environments.

Research Methods: We study hospitals in Pennsylvania which has one of the oldest populations in the United States. This is important, since older individuals have significantly more vision problems than their younger counterparts. The researcher's aim is to secure participation at least 20% of hospital across Pennsylvania.
The innovative interview methodology will demonstrate whether or not the implementation of low vision-built environment in hospitals has been followed. The qualitative data obtained will be supplemented by quantitative data that will be obtained from secondary sources such as the Center for Medicare and Medicaid. Finally, a multivariate logistic regression model will be utilized to determine the important low vision factors that are necessary for the safety of low vision patients. .

Findings: Since the study is in its initial stage, there are no findings yet. In fact, so far, the category of vision disability conducted, by other researchers, has only focused on individuals who are blind or have impaired sight. Thus ,this study conducted is one of the first ones that wants to study hospital environment (accommodations) for individuals with low vision.

Discussion of Results: The researcher is in the process of conducting the study of accommodations of low vision patients in hospital settings. Hopefully, specific results will be relevant to hospital management that covers a spectrum that includes development of clinical indicators and study of the use and impact of information on patients with low vision, their caregivers that include ophthalmologists, nurses and others, as well as students of health administration and those who conduct research in this area.

Implication for Health Professionals: Enhancing our understanding of hospital accommodations for individuals with low vision will help patients with low vision in hospitals regardless of their age, by lowering their likelihood of being injured, since individuals with low vision are more likely to fall. This is particularly true of older patients who also have lower vision. In fact, as population ages, the vision impairment increases, thus, by improving hospital vision environment, we would especially help older persons to function better.

HOW NEW WAYS OF WORKING ARE CHANGING THE HEALTHCARE SECTOR

Alexander Redlein, Vienna University of Technology
Claudia Höhenberger, Vienna University of Technology

ABSTRACT

New Ways of Working are changing the demand for infrastructure and services in all industries. The service industry has been facing this trend for several years. The core business is changing. People can work where, when and how they like. Employees come to the office mainly for formal and informal meetings. Office environments are designed to engage employees, support communication and innovation, and to win and retain talents. Finding and keeping good people and explicitly linking their individual goals to corporate ones is one of the main challenges for companies today (Harvard Business Review May 2010). For healthcare provision this means a transformation of medical facilities towards service-based amenities. There are two notable aspects:

1. New demands by the patients
2. New demands by the employees of the healthcare organization itself: Changes to infrastructure and security will enable health care professionals to better attend those in their care.

In a first step, a literature review was conducted to determine which room parameters affect wellbeing the most. Hospitals, walk-in clinics, and doctors' offices are areas of high sensitivity regarding physical and psychological wellbeing. Therefor special care has to be taken to fulfil the legal and human requirements towards areas such as the ventilation systems, CO2 levels, CO levels, NH3 levels, general air composition (especially with regards to mixed gas), temperature, humidity, acoustics, lighting and illumination. Considerations about the building's age and its construction materials are also important. These physical conditions have to be kept in order to ensure the safeguarding of patients as well as of employees.

To determine how the healthcare provision itself and its workplace environment are changing, expert workshops were conducted in German speaking countries. Two major aspects of how new ways of working are affecting healthcare institutions were identified. Firstly, new demands by patients occur, such as "productive waiting" areas where work can be conducted uninterrupted and comfortably. This means that healthcare facilities serve as remote offices and have to be equipped accordingly, by providing lounge like waiting areas and focus room settings. Technologies like Virtual private Networks, allowing access to critical data in a secure way everywhere, cloud services, and VOIP telephone systems also enable new ways of working. Therefor improved Wi-Fi and charging stations for laptops were also requested.

And secondly new demands by healthcare professionals arise, such as stress reducing environments, a better employee experience, better work-life balance, increased autonomy, and activity based working areas. These are all things that are already widely spread in other industries and will now get important in healthcare as well. In addition to these baseline demands healthcare professionals see an increase in communication and exchange as vital to ensure good patient care in an increasingly complex field. Communication areas where formal as well as informal meetings can take place gain more importance.

The presentation will cover all three areas:

1. A short summary of the relevant laws and standards specifying room climate parameters
2. The changes in demand of the infrastructure and services for patients
3. The changes in demand of the infrastructure and services for health care employees

HOSPITAL AND COMMUNITY CHARACTERISTICS ASSOCIATED WITH BABY FRIENDLY STATUS IN US HOSPITALS

Aurora Tafili, University of North Florida
Hanadi Hamadi, University of North Florida
Ashraf Affan, Angel Kids Pediatrics
Aaron Spaulding, Mayo Clinic Jacksonville

ABSTRACT

The Baby Friendly Hospital Initiative is a global program that gives recognition and designation to hospitals that promote breastfeeding and the safe preparation and delivery of formula. Currently, the number of babies born in baby friendly facilities make up 28.45% of annual births in the U.S. However, hospital and community characteristics that influence the adoption of facilities' baby friendly status have yet to be investigated. This study seeks to determine the impact of hospital performance and characteristics, and community factors on hospitals' attainment of baby friendly designation.

We conducted an observational cross-sectional study. We used a multilevel logistic regression analysis to examine the impact of hospital and community factors on hospitals' attainment of baby friendly designation. Data was retrieved from the Baby Friendly USA designation program, American Hospital Association (AHA) annual survey, Centers for Medicare and Medicaid Services Hospital Value Based Program (HVBP), US Census Bureau Current Population Survey, and Census Bureau Region and Division Codes and Federal Information Processing System (FIPS) Codes for States. A total of 353 Hospitals were baby friendly.

Our primary findings indicate that baby friendly hospitals were more likely to be large hospitals and serve a large community of African American females. For-profit and not-for-profit hospitals were less likely to be designated baby friendly than their non-federal government counterparts, and baby friendly hospitals were less likely to be located in the south and west regions of the U.S. Additionally, baby friendly hospitals were less likely to reside in competitive markets as measured by Herfindahl–Hirschman Index.

The literature suggests a relationship between baby friendly designation and improved breastfeeding outcomes both in the US and globally. This study identifies principal hospital and community factors that differentiate baby friendly adoption. As the number of baby friendly hospitals continues to rise, obtaining baby friendly designation will provide a strategic advantage in offering evidence-based maternity care. In order to properly examine the true impact of baby friendly designation, new performance measures need to be developed as current measures like PC01 lack the ability to provide complete insight.

REASONS FOR RAPIDLY INCREASING PRESCRIPTION DRUG PRICES ----------, FILL IN THE BLANK!

Gene C. Wunder, Washburn University
Judy K. Wunder, Wunder Consulting Group

ABSTRACT

This abstract is an exploratory thought paper and does not proport to offer solutions. This abstract and the paper will examine selected suspected and likely causes of price escalation of prescription drugs largely manufactured by Big Pharma. Each year brings a round of price increases brand name drugs as well as generics usually led by Big Pharma. The retail price of pharmaceuticals produced by Big Pharma continues to outpace the rate of inflation. Seemingly everyone in the channel of distribution points to another entity as the cause of the increases. The result is a circular firing squad that would be comic relief if it did not seriously and sometimes tragically impact the health and life of the patients who benefit and often personally pay for the prescription drug. Each year millions of prescriptions are never filled by patients who cannot afford to purchase the drug even with an insurance co-pay insurance. Listening to the news readers on electronic media, reading the print media, conversation with physicians, pharmacist, or other health care providers, friends, neighbors, etc. will elicit numerous reasons and/or excuses for high prices (and going higher) for the foreseeable future. Here are some of the selected and suspected causes to be examined.

Mergers and acquisitions (M&As) continue in the pharmaceutical industry. Since 1999, there have been 46 mergers, domestically and internationally, with purchase prices exceeding 10 billion US dollars. The result is that the largest have become much larger often buying start-ups with promising new drugs and smaller competitors. In 2018, six of the largest pharmaceutical companies account for 78 percent of branded drugs. M&As in the pharmaceutical industry give Big Pharma pricing power that cannot be challenged or matched by smaller competitors.

M&A in closely related segments of the healthcare industry have followed the trend of consolidation. Healthcare providers buying insurers (CVS/Aetna) and Pharmacy Benefit Managers (PBMs) continue to consolidate this segment of the industry. In 2018, there were less than 30 PBMs, down from 60 in 2013. The 30 PBMs control 78 percent of the market. PBMs seem to attract much of the criticism for higher drug prices. In a recent (1-16-20) article NEWSWEEK referred to PBMs as the "hidden villain." PBMs appearing to be a major player in drug price escalation. In 2016, the largest PBMs had higher revenues than the largest pharmaceutical manufacturers. PBM's "cut" of drug prices has increased tenfold since 2016.

Lack of transparency within the channel of distribution from the manufacturer to the last health care provider to touch the product is another issue. Pharmacy Benefit Managers (PBMs) are organizations who serve as middlemen between manufacturers and retail pharmacies, healthcare insurance companies, or other healthcare providers. In theory the PBM negotiates discounted prices for suppliers who in turn serve the end user or the patient who has a prescription filled. The PBM is supposed (in theory) pass some of the negated discounts on down the line to ultimately help patients pay for prescription drugs. There is strong evidence that this is frequently not the case. The healthcare business in general is difficult to untangle and the customer seldom knows if they are getting a fair and equitable break.

The United States Federal Government appears to be a significant part of the problem. The anti-trust watchdogs; the Department of Justice (DOJ and the Federal Trade Commission (FTC), have been either disinterested or unwilling to touch the subject of anti-trust in a major way since the AT&T breakup in the1980s. The anti-trust watchdogs have with few exceptions, allowed mergers and accusations to go without comment. The Aetna-Cigna and Sprint-T-Mobile case being a high -profile cases of late. Recently most of the talk relating to anti-trust has been directed at Big Tech. Congress has been occupied in matters relating to impeaching President Trump, Medicare for All, The Border Wall, trade and tariff and seemingly minor issues here and there.

The issues discussed here represent perhaps some insight into the problem of escalating drug costs. The "evidence" appears to be plentiful and seemingly presents an easy fix. However, it should be noted that what appears to be straight forward does not present an easy fix. Lack of transparency, the enormous sums of money involved, and the reluctance to give up a very comfortable and profitable set of circumstances is not likely to happen.
This topic will see millions of pages and billions of words written and spoken as a solution is sought. This writer does not expect a solution anytime soon. Clearly more research is needed.

TRACK

PUBLIC HEALTH

PREVALENCE OF OVERWEIGHT/OBESITY, ANEMIA, AND THEIR ASSOCIATIONS AMONG FEMALE UNIVERSITY STUDENTS IN DUBAI, UAE: A CROSS-SECTIONAL STUDY

Haleama Al Sabbah, Zayed University
Mustafa Younis, Jackson State University
Jai Parkash, Keiser University
Adnan Kisa, Kristiana University College

ABSTRACT

The purpose of this cross-sectional study is to assess the association of overweight, obesity, and anemia with the demographic characteristics, selected lifestyle factors, total body fat, and abdominal obesity among university female students in Dubai. Sixty percent of the students reported that they prefer junk food, the highest percentages were found among obese (71.4%) and anemic (72.1%) students compared to normal weight and students without anemia (p=0.05). Overweight, obesity and anemia are prevalent among female university students. Further studies with a greater number of males and females are required to investigate on the detailed dietary habits of overweight and obese young adult females with anemia.

INTRODUCTION

Obesity and overweight are major public health problems that are associated with a higher mortality rate worldwide (Flegal, Carroll, Kit, & Ogden, 2012). Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health, leading to reduced life expectancy and or increased health problems (World Health Organization, 2000). Previous studies have shown that it is more prevalent among women than men and that young adult females in general are at an increased risk of developing anemia (World Health Organization, 2000; Kassebaum et al., 2014; De Andrade Cairo, Rodrigues Silva, Carneiro Bustani, & Ferreira Marques, 2014) .

Decreased count of red blood cells and diminished hemoglobin levels are often what characterize anemia (Kassebaum et al., 2014). The occurrence of anemia is enhanced by factors including puberty, excessive menstrual losses, giving birth, poor dietary choices, and insufficient iron intake from animal based foods (De Andrade Cairo, Rodrigues Silva, Carneiro Bustani, & Ferreira Marques, 2014). Anemia has been linked to several health consequences such as impaired physical and cognitive performance, and increased risk of maternal and child mortality (Kassebaum et al., 2014; De Andrade Cairo, Rodrigues Silva, Carneiro Bustani, & Ferreira Marques, 2014; Sachdev & Gera, 2013).

Food habits can result in anemia and increase the risk of obesity, particularly among young females (Urbano, Vitalle, Juliano, & Amancio, 2002; Vaskonen, 2003; Zimmermann et al., 2008; Menzie et al., 2008; Lecube et al., 2006). Factors involved include skipping breakfast, reduced intake of fruits and vegetables, and increased consumption of sugary drinks and high calorie foods (Prochnik Estima, da Costa, Sichieri, Pereira, & da Veiga, 2009; Levy et al., 2010). Several previous studies indicated that anemia is more prevalent among overweight and obese adults in general (Zimmermann et al., 2008; Menzie et al., 2008; Yanoff et al., 2007; Pinhas-Hamiel et al., 2003), and also among overweight children, adolescents, and young adults (Zimmermann et al., 2008; Moayeri, Bidad, Zadhoush, Gholami, & Anari, 2006; Nead, Halterman, Kaczorowski, Auinger, & Weitzman, 2004).

A study in the Kingdom of Saudi Arabia showed that the prevalence of anemia among female university students was 23.9% (Al-Sayes, Gari, Qusti, Bagatian, & Abuzenadah, 2011). Given the health consequences of anemia, its increased prevalence among females and the obesity epidemic worldwide, studying the prevalence of obesity and overweight and their associations with hemoglobin level and food habits is a major part of this study to guide future studies and interventions.

International and regional studies show an increase in obesity rates and highlight that factors associated with it are multi-factorial particularly among university students, but there has been little relevant research relating anemia to obesity and total body fat in the United Arab Emirates (UAE) (Flegal, Carroll, Kit, & Ogden, 2012; World Health Organization, 2000; Moayeri, Bidad, Zadhoush, Gholami, & Anari, 2006; Nead, Halterman, Kaczorowski, Auinger, & Weitzman, 2004; Al-Sayes, Gari, Qusti, Bagatian, & Abuzenadah, 2011). The main objective of this study is to assess the prevalence of overweight, obesity, anemia and their associations with the eating habits, physical activity. and total body fat among female students at Zayed University-UAE.

METHODOLOGY

Study design

A cross-sectional study was conducted on 251 female students at Zayed University (ZU) in Dubai from 24th November to 10th December 2014. Ethical clearance was obtained from the Zayed University Ethical Committee prior to conducting the study. Following ethics approval (No. ZU14_052_F), students were informed that participation in the study is voluntary, and before data collection students were provided with full information about the study and given the opportunity for potential participants to ask any question before they signed the written informed consent.

Population and sampling

The total number of female students enrolled at ZU in fall 2014 at Dubai campus was approximately 3000 Emirati undergraduate students. In order to have a 10% of the total population representative sample from all colleges, the estimated sample size was 300 students selected by using a systematic random sampling from: Colleges of Arts, Business, Communication and Media, Education, Sustainability and Human Sciences, Technology, and University College. Students' names and numbers were imported from the university's Banner Web in fall 2014 semester. An interval of 10 was used to select students randomly from the imported list and a random starting number was obtained by using Excel. In addition, the Students' Affairs Office at the university and all university teachers were informed about this study in order to encourage students to participate. Since they were blinded from knowing who was selected, they advertised the study to all their students.

Data collection

307 randomly selected students were invited via e-mails to come to the University Nutrition Lab and participate in completing the study questionnaire and to measure their weight, height, waist circumference, total body fat and hemoglobin level.

One female nurse and two research assistants were recruited and trained to take the measurements for the participating students. In total, 251 students came to the lab and agreed to participate in this study, resulting in a response rate of 81.8%. Two senior students on their final year from the Department of Public Health Nutrition who received training on nutrition education under the supervision of a professor in nutrition were giving nutrition education to students who had low hemoglobin level and students with obesity or underweight. In addition, students with low hemoglobin level were referred to the university health center for follow up.

Procedures and measurements

The participating students completed a self-reporting questionnaire consisting of questions regarding eating habits and physical activity. The questionnaire included socio-demographic factors and variables related to obesity,

anemia, and lifestyle. It was developed based upon information existing in the related literature. To ensure that the questionnaire items accurately addressed the research questions and the questionnaire was appropriate, and the questions were well defined, clearly understood by the students and presented in a consistent manner, the questionnaire was validated by a professor in nutrition and piloted on 20 students who are not included in this study analysis.

In addition, weight and height were measured by using calibrated scales and stadiometers, waist circumference was measured under clothing by flexible measuring tapes between the lower margin of the last palpable rib and the top of the iliac crest, hemoglobin level (HB) was measured by using Hemocue analyzer and total body fat percentage was measured by Tanita machine at the University nutrition lab.

The principal measurements used in this study are:

- Anthropometric: Height and waist circumference were measured to the nearest 0.5 cm. Body weight was measured with the help of a digital weighing machine and rounded to the nearest 0.1 kg. In order to test the reliability of the students' anthropometric measurements, weight, height and waist circumference were measured three times for each student; only the two closest measurements were averaged and considered while the third was excluded. The participants were weighed with a minimum of clothing and no shoes.

- Body mass index (BMI): BMI was calculated by dividing weight in kg by the height in meters squared (kg/m^2). BMI was categorized into underweight (BMI<18.5), normal (BMI=18.5-24.9), overweight (BMI=25-29.9), obese (BMI ≥ 30) (World Health Organization, 2000).

- Abdominal obesity: Abdominal obesity was assessed using the waist circumference (WC) measurement and was based upon the World Health Organization (WHO) criteria for cutoffs (WC ≥88 for females and ≥102 for males) (Al-Sayes, Gari, Qusti, Bagatian, & Abuzenadah, 2011).

- Hemoglobin level (HB): Blood samples were collected by a professional nurse from participating students using finger pricks and analyzed by a Hemocue analyzer. According to the WHO, the level of anemia among non-pregnant women aged 15 years old and above was defined by HB level below 12mg/dL (World Health Organization, 2007).

Statistical analyses

Data obtained was analyzed using IBM SPSS Statistical package version 22. Data were expressed as mean ± SD unless where stated. Chi-square test was used to compare frequencies between categorical variables. The significance level was set at 0.05.

RESULTS

Table 1 shows the sample's socio-demographic characteristics. The mean age and standard deviation were 23.1± 5.3. The majority perceived having a moderate economic status (82.3%). Of the total, 7.6% reported being married and 4% were engaged.

The prevalence of overweight and obesity was found to be 29.3% (17.4% and 11.9%, respectively). The prevalence of the abdominal obesity (WC ≥ 88 cm) was 8.5%, with a waist circumference mean and standard deviation value of 71.6± 10.5cm. The prevalence of anemia was 18.1%, with a hemoglobin level mean and standard deviation of 12.95 +1.3 ranging between 8.6 – 16.1 (Table 2).

Table 3 shows the socio-demographic characteristics of the study participants by weight status and hemoglobin level. Females aged 20 or younger were more likely to be underweight (20.9%), while females older than 20 were more likely to be overweight (20.8%). In addition, anemia was more prevalent among female students aged > 20 years old (23% vs. 14.5%), with no significant difference (p=0.066).

The prevalence of underweight was found to be the highest among female students in their 1st year of study (30%). No association was found between overweight, obesity and year of study (Table 3). Overweight, obesity and anemia were more prevalent among female students who perceived that their families have moderate economic status (17.4%, 13.3% and 19.7% respectively) than those who perceived that their families have high economic status (14.4%, 4.3% and 11.9% respectively) (Table 3).

Table 1: Socio-demographic Characteristics

Characteristic	N	%
Age		
≤20 years	143	57.7
>20 years	105	42.3
Academic level		
1st year	40	15.9
2nd year	47	18.7
3rd year	73	29.1
4th year	91	36.3
Economic status- perception		
High	44	17.7
Moderate	204	82.3
Marital status		
Single	221	88.4
Engaged	10	4.0
Married	19	7.6

Table 2: Prevalence of Overweight, Obesity and Anemia

Variables	**N**	**%**	**Min-Max**	**Mean +SD**
Measured BMI (kg/m2)				
Underweight	37	17.0	14.2 – 43.7	23.1± 5.3
Normal	117	53.7		
Overweight	38	17.4		
Obese	26	11.9		
Waist (cm)				
<88	216	91.5	54.0 – 107.3	71.6 + 10.5
≥88	20	8.5		
Total	236	100		
HB level (mg/dL)				
≥12 (No anemia)	195	81.9	8.6 – 16.1	12.95 +1.3
<12 (Anemic)	43	18.1		

Table 4 shows that abdominal obesity (Waist ≥88 cm) was more prevalent among obese students (59.3%) than among overweight (7.3%) and normal weight (0.8%) students, (p<0.001). The percentage of total body fat measured by the Tanita machine was the highest among obese (96.3%) and overweight (66.7%) students, while only 2.9% among normal weight students (p<0.001). Moreover, the percentage of total body fat was found to be the highest (38.9%) among students with anemia (p<0.05) (Table 4).

DISCUSSION

This study aimed to assess the prevalence of overweight, obesity and anemia and their associations with socio-demographic characteristics, lifestyle, total body fat, and abdominal obesity among university female students in Dubai. Based on our current knowledge, this is the first study conducted among university female students in Dubai covering this topic. A systematic random sampling approach was used to ensure that the selected students were representative of all the university's female students.

Both obesity and anemia are worldwide epidemics affecting vulnerable population (Low, Chin, & Deurenberg-Yap, 2009). In this study, 17.4% of the participants were found to be overweight, 11.9% were obese and 8.5% had abdominal obesity following the WHO classification (World Health Organization, 2000). Abdominal obesity prevalence has not been reported before among university female students in Dubai. Abdominal obesity is associated with increased risk of type 2 diabetes, cardiovascular disease, sleep apnea and premature death (Paley, & Johnson, 2018). The prevalence of obesity found in this study is close to the WHO's estimates and highlights the importance of obesity as a public health problem (Micozzi, Albanes, & Stevens, 1989).

Table 3: Socio-demographic Characteristics by Weight Status and Hemoglobin Level

Characteristics	Weight status (%)				*p**	HB level (%)		*p**
	Underweight (n=37)	Normal (n=117)	Overweight (n=38)	Obese (n=26)		Anemia (n=43)	Normal (n=195)	
Age								
≤20 years	20.9	53.2	14.4	11.5	0.463	14.5	85.5	0.066
>20 years	14.9	52.5	20.8	11.9		23.0	77.0	
Academic level								
1st year	30.0	40.0	17.5	12.5	0.736	20.5	79.5	0.233
2nd year	17.0	53.2	14.9	14.9		8.5	91.5	
3rd year	15.7	57.1	17.1	10.0		23.2	76.8	
4th year	15.7	55.4	18.1	10.8		18.1	81.9	
Economic status perception								
High	16.8	64.5	14.4	4.3	0.324	11.9	88.1	0.168
Moderate	17.9	51.3	17.4	13.3		19.7	80.3	
Marital status								
Single	18.5	51.7	16.6	13.3	0.432	16.7	83.3	0.492
Engaged	16.7	55.6	27.8	0.0		27.8	72.2	
Married	20.0	70.0	10.0	0.0		20.0	80.0	

*Chi square test.

About one fifth (18.1%) of the study participants were anemic based on the WHO cutoff values (De Benoist, McLean, Egli, & Cogswell, 2008). Hemoglobin concentration can indicate the severity of anemia (World Health Organization, 2007). This study found that high level of total body fat was associated with anemia among female students (p=0.030). Also, low levels of exercise and preferences to eat junk food were found to be associated with anemia among female students. This might be explained by the fact that poor dietary choices -which has been reported in this study as high preference for "junk food"- are generally deficient in essential nutrients especially iron or have substances that reduce iron absorption. The students with anemia reported high tendency to engage in dieting behavior at the time of the study, which can explain our results if they were following fad diets that are based on eliminating major food groups. Also, students with anemia have increased percent of total body fat which can make exercise harder in addition to their anemia.

Obesity may stimulate anemia by inhibiting dietary iron uptake from the duodenum or that adipose tissues could increase the production of pro-inflammatory cytokines which interfere with erythropoietin production (Aigner, Feldman, & Datz, 2014). Several analyses demonstrated an association between lower serum iron concentrations with

higher BMI, particularly in women (Micozzi, Albanes, & Stevens, 1989). This study found significant associations between anemia and total body fat.

Obese (BMI ≥ 30) and underweight (BMI < 18.5 kg/m2) students were found to be two times more likely to have anemia compared to normal weight (BMI=18.5-24.9) students. This might be due to the fact that anemia is one of the most common nutritional deficiency disorders (Massawe, Urassa, Nyström, & Lindmark, 2002; Bentley & Griffiths, 2003).

Table 4: Associations of Weight Status and Hemoglobin Level with Waist Circumference, Percentage of Total Body Fat and Selected Lifestyle Characteristics

Characteristic	**Total**		**Weight status (%)**					**HB level (%)**		
	N	%	Und.	Nor.	Ove.	Obe.	*p**	Anemia	Normal	*p**
Waist (cm)										
<88	216	91.5	100.0	99.2	92.7	40.7	**0.000**	90.5	91.4	0.507
≥88	20	8.5	0.0	0.8	7.3	59.3		9.5	8.6	
Total	236	100	100	100	100	100		100	100	
Total body fat										
Athletic (8-15%)	12	5.9	28,2	1.0	0.0	0.0		8.3	5.5	
Good (16-23%)	39	19.2	61.5	14.4	0.0	0.0	**0.000**	25.0	18.3	**0.030**
Acceptable (24-30%)	63	31.1	10.3	55.8	3.0	0.0		25.0	32.9	
Overweight (31-36%)	38	18.7	0.0	26.0	30.3	3.7		2.8	21.3	
Obese (≥37)	51	25.1	0.0	2.9	66.7	96.3		38.9	22.0	
Total	203	100	100	100	100	100		100	100	
Sleeping hours/ day										
Less than 7	91	37	37.2	33.3	36.6	46.4	0.669	43.9	35.4	0.560
7-8	123	50	48.8	55.3	43.9	42.9		43.9	52.6	
More than 8	32	13	14.0	11.4	19.5	10.7		12.2	12.0	
Total	246	100	100	100	100	100		100	100	
Exercise ≥ 60 min.										
Yes	140	56	38.6	56.7	67.5	60.7	0.050	44.2	59.3	0.050
No	110	44	61.4	43.3	32.5	39.3		55.8	40.7	
Total	250	100	100	100	100	100		100	100	
Meals pattern										
Always regular	71	28.3	22.7	34.6	22.0	10.7	**0.039**	23.3	28.7	0.301
Irregular	180	71.7	77.3	65.4	78.0	89.3		76.7	71.3	
Total	251	100	100	100	100	100		100	100	
Breakfast pattern										
Regular	105	41.8	29.5	46.5	43.9	39.3	0.439	41.9	43.1	0.942
Irregular	129	51.4	63.6	45.7	53.7	53.6		51.2	51.3	
I don't eat	17	6.8	6.8	7.9	2.4	7.1		7.0	5.6	
breakfast	251	100	100	100	100	100		100	100	
Total										
Dieting to lose weight										
Yes	61	24.4	2.3	17.5	43.9	53.6	**0.000**	18.6	25.3	0.237
No	189	75.6	97.7	82.5	56.1	46.4		81.4	74.7	
Total	250	100	100	100	100	100		100	100	
Prefer junk food										
Yes	150	59.8	59.1	58.3	63.4	71.4	0.606	72.1	57.4	0.053
No	101	40.2	40.9	41.7	36.6	28.6		27.9	42.6	
Total	251	100	100	100	100	100		100	100	

*Ch2 test. Und. = Underweight, Nor. = Normal, Ove. = Overweight, Obe. = Obese, HB = Hemoglobin

Limitations

The nature of cross-sectional study design poses a challenge in inferring causal relationships especially when examining temporality. Whether obesity has led to anemia and lack of exercise or poor diet choices and lack of activity led to obesity and anemia cannot be determined from the results of this study. While this study investigated dieting behaviors, it did not ask for a complete food recall which could have led to different interpretations of what can "junk food" mean.

Table 5: Weight comparisons of the participants

	Anemia (HB<12)		Normal (HB≥12)		Total	
Weight Status	**N**	**%**	**N**	**%**	**N**	**%**
Underweight	11	29.7	26	70.3	37	100
Normal	15	13.3	98	86.7	113	100
Overweight	8	21.6	29	78.4	37	100
Obese	7	26.9	19	73.1	26	100

*Ch_2 test, p-value =0.097

CONCLUSION

Overweight, obesity and anemia are prevalent among university female students in Dubai. This study found associations between anemia, lack of physical activity and percentages of total body fat among young female adults. This may be related to unbalanced diets and preferences of junk food as reported in this study. Future studies can focus on more detailed dietary habits of overweight and obese young adult females with anemia to better understand this group. Health promotion and nutritional education programs are needed to reduce the prevalence of anemia, overweight, and obesity among university female students. Qualitative studies are needed to investigate in depth the contributing factors to obesity and anemia development among university female students in UAE.

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ANALYSIS OF FACTORS DETERMINING MATERNAL ATTITUDES TOWARDS CHILDHOOD VACCINATION

Lucia Ludvigh Cintulova, St. Elisabeth University of Health and Social Sciences
Libuša Radkova, St. Elisabeth University of Health and Social Sciences

ABSTRACT

Slovakia is well-known for the long-term vaccination programme that covers more than 90% of Slovak inhabitants in order to support collective immunity and eliminate some fatal diseases. Changes have been made because of some recent anti-vaccination campaigns. These have influenced some parental attitudes towards childhood vaccination and caused an increasing number of parents choosing to reject their children getting vaccinated. That is why the Public Health Institute introduced the policy that children who are over 3 years old but did not get the vaccinated would not be allowed to attend kindergarten as a part of pre - primary education. Slovakia has had to face a spreading epidemic of measles in 2018. For twenty years, measles hardly had any incidences reported in Slovakia. So the issue of the childhood vaccination is genuine and discussed all over the world.

INTRODUCTION

Given the spread of viral and epidemiological diseases such as measles in Slovakia and EU countries, it is essential to ensure collective immunity, which will promote the protection of the health of children and the general population. If we achieve a sufficient level of vaccination for children and maintain the collective immunity of the population, the quality of life of individual families will also increase. For this reason, the Slovak Republic decided to adopt changes in the vaccination system and make the admission of children to pre-school (kindergarten) based on their vaccination status. Countries such as the Czech Republic, Lithuania and France have introduced similar conditions in an effort to eliminate the growing trend to not vaccinate children.

The basic vaccination program in Slovakia includes vaccination of children against diphtheria, tetanus, whooping cough, polio, viral hepatitis B and homophilic invasive infections. These are mandatory as part of the regular mandatory vaccination. Primary vaccination is carried out with three doses of hexavalent vaccine at the 3rd, 5th and 11th months of the child's life. The first dose is given on the first day of the tenth week of life.
Until now, in 2019, a child who has not undergone mandatory vaccination may be admitted to a preschool. However, in the forthcoming amendment to the Act on Protection, Promotion and Development of Public Health, the government proposes to introduce an obligation that a child can be accepted only if he or she has undergone the mandatory regular vaccination that is appropriate to the age of the child according to the vaccination schedule, or has an attestation from the attending physician that he is immune to the disease or cannot be vaccinated due to permanent contraindication.

At the present time, parents who have refused to vaccinated their children are abusing and risking the collective protection of vaccinated children. This is unethical. Unvaccinated children put other children at risk if they have not developed protective levels of antibodies despite being vaccinated. This may be because the vaccinated child has a weakened immune system or has a chronic disease. As a result, their vaccines are not 100% effective, despite being vaccinated. 1-2% of children may remain susceptible to an infection after vaccination. Unvaccinated children also endanger children who, for serious health reasons, cannot be vaccinated, such as children after transplantation, with cancer, etc. Similarly, the Slovak government supports the abolition of penalties, like paying a penalty, for refusing compulsory vaccination. This penalty system would not protect the child from the disease. Nor does the penalty sufficiently deterrent for parents to decide to have the child vaccinated. Budayová (2019) highlights the problem of the Roma population and their decreasing health conditions that are link with the bad eating habits and financial situation of the Roma families.

When the infectious diseases occur less and less, thanks to vaccination in Slovakia, much of the public in recent years has been influenced to believe that vaccination against it is unnecessary. The lay public of parents has

been led to believe that there are unnecessary, useless and ineffective vaccinations, which currently endanger the collective health of the population. Many parents have access to a variety of information and have succumbed to anti-vaccination campaigns that spread on the internet. This spurious information questions the importance of an established vaccination program in Slovakia and Europe. At the same time, the public's voice, which calls for the mandatory vaccination to become optional, is growing stronger. However, with the movement of people between countries, whether for work or traveling, the introduction of any infectious disease into the Slovak Republic should not be excluded. An example are the measles epidemics in 2018 and 2019, which mainly affected eastern Slovakia.

This research was focused on finding out what is the current situation in Slovakia in relation to compulsory vaccination, why parents refuse compulsory vaccination, and which factors influence their decision to vaccinate or not to vaccinate the child.

The vaccination program and the actual situation in Slovakia

Mandatory vaccination is carried out with the priority of protecting the individual and the entire population from dangerous and life-threatening infectious diseases. It is based upon Act no. 355/2007 Coll. and was confirmed by the Constitutional Court of the Slovak Republic. In 2013, the Constitutional Court of the Slovak Republic filed a petition to rule on the constitutionality of legislation that required compulsory vaccination. In 2014, the Constitutional Court ruled that (I deleted much of the sentence. It was really hard to read). the provisions on compulsory vaccination do not contradict the Constitution of the Slovak Republic.

Based on the available statistics and data from the public health sector, if parents refuse vaccination, they are the ones that are against measles, mumps and rubella vaccine (MMR vaccine for short). This would be in violation of the compulsory vaccination against the MRD (UVZ, 2019):

- in the year of birth 2016 there were 1,635 rejected vaccines (2.8% of the number of children in the year of birth subjected to vaccination),

- 2015 year of birth detected 1 593 rejected vaccines (2.9% of the number of children subjected to vaccination in the year of birth),

At the regional level, the highest rejection rate for compulsory vaccination was in the Trenčín and Bratislava regions (4.5 - 4.8% in the referred birth years).

However, there are parents who refuse other types of vaccination and re-vaccination, whether the vaccination with a hexavalent vaccine and subsequent re-vaccination against diphtheria, tetanus, whooping cough and polio, or vaccination against pneumococcal invasive diseases. Most parents refuse vaccination with a first dose of measles, mumps and rubella vaccine. An average of 1,700 rejected vaccines each year (a slight decrease in vaccination refusals is reported in 2018), followed by a refusal of vaccination against pneumococcal invasive diseases, on average , 1,200 refused vaccinations every year. Hexavalent vaccine has been rejected by 1,100 parents each year. The number of parents refusing vaccination is approximately the same every year for all types of vaccination. In Slovakia, it is mandatory to vaccinate against ten infectious diseases (ÚVZ, 2019). Between 1997 and 1998 the measles epidemic began in the district of Spišská Nová Ves. Most affected were the villages Letanovce, Rudňany, Bystrany and Krompachy, from where the disease transferred to the district Gelnica. Of the 1,150 patients, 748 were unvaccinated, including children under five (at least 470 cases).

In 2018, a measles epidemic broke out in the east of Slovakia, 20 years after the last measles epidemic. The disease occurred in almost 180 children (who were not vaccinated) under 5 years of the total of 565 measles cases. In 2019 (between January and March), the measles disease was reported in almost 75 children under 5 years of age who were not vaccinated, out of a total of 150 cases of measles disease, representing 50% of unvaccinated children.

According to medical records, there has been doubts in the public about the effectiveness of vaccines, as measles were also spreading to children who had been vaccinated. For this reason, ÚVZ SR (Public Health

Institution in Slovakia) subsequently carried out additional laboratory examinations at the National Reference Center for Morbilli, Rubella and Parotitis in order to find out whether the people who were suffering from measles and according to their medical documentation were vaccinated with two doses of combined stable measles, mumps and rubella vaccine (MMR), and would have antibodies against rubella in their systems. 103 additional serum samples were collected as part of the additional laboratory examination, with 81 negative samples tested for anti-rubella antibodies. In view of these results, it cannot be excluded that these persons have not been vaccinated despite the data on MMR vaccination in their medical records. It should be pointed out that the vaccine antigen inducing anti-rubella antibodies is highly immunogenic and if children were really vaccinated, it should be detectable in 96% to 98% of examinations, as clearly demonstrated by the Immunological Survey carried out in 2018 (ÚVZ – Slovak Public Health Institution, 2019).

Attitudes toward childhood vaccination

In recent years, the use of the internet to obtain vaccine information has increased. We want to know more about the current trends for those who seek vaccine information. We want to know about the new generation of mothers who take care of kids and what they prefer to use when obtaining vaccine information. What are their perceptions of the accuracy and integrity of these sources accuracy? Have their beliefs about vaccination has been changed? They are no more dependent to the traditional way of thinking about vaccination safety. Parents who do not view their child's healthcare provider as a reliable vaccine information source are more likely to obtain vaccine information using the internet (Abbey M. Jones et al., 2012).

Lack of time and the degree of health literacy and knowledge of their patients, however, constrain a provider's ability to communicate vaccine risks and benefits that might address parental concerns and foster trust (Douglas et al , 2011). Parents have said that their hesitation about vaccines hesitant often are related to the fact that vaccines are unnatural (Omer, Salmon, et al, 2009).
Most of attitudes toward vaccination of kids under 3 years old are based on their sources of information. Positive and negative experiences and the strongest impact on the decision making usually are based on the lack of awareness about the vaccination, but, instead with the fear of the risks of vaccination.
Many barriers have been identified that keep people from vaccinating their children. They are the following: concern about the risk of adverse effects, concern that vaccinations are painful, distrust of those who advocate vaccines (including belief in conspiracy theories), belief that vaccination should not occur when the child has a minor illness, unpleasant staff or poor communication, and lack of awareness of the vaccination schedule (Mills, Edward et al., 2005).

Parental acceptance of childhood vaccines is eroding. Nonmedical exemption rates continue to increase annually. The proportion of parents who reported that they have no concerns about childhood vaccines remain less than 25% and is growing, as is the development and testing of interventions that address these barriers (Douglas, Opel, et al, 2013).

To maintain and improve on the success of childhood vaccines in preventing disease, a holistic approach is needed to address parents' concerns. To communicate effectively with parents about vaccines and vaccine-preventable diseases, it is necessary to continually assess their vaccine-related attitudes and concerns (Kennedy et al, 2011).

The majority of Slovak parents report that they believe that vaccines are important to children's health (91%). Another 87.0% of them say that they are confident in vaccine safety (87.0%). One of their vaccine-related concerns that is listed most often by parents is how much the shot will hurt. (58%) Another concern is about how unnatural vaccines are supposed to build immunity (25%). Some Slovak parents stop believing in MMR vaccine. If they refuse to get their child vaccinated it is due to fear, no trust and belief in the safety, efficacy and usefulness of vaccines. They start to believe that the fatal disease can not appear because after many years of universal immunization, the body is protected and doesn't need any more unnatural vaccinations.

Parents who exhibit doubts about immunizations are not all the same. Practical experience suggests encouraging children's health care providers to build relationships of trust when they are asking patients questions.

Then when they provide appropriate educational materials to parents, the parents will respond more favourably to make a right decision about children health (Gust et al, 2008).

METHODOLOGY

Childhood immunity by applying a vaccine almost guarantees protection from many major diseases. So, why is the attitude against vaccination based on no trust? Why has parental refusal of vaccination has been increasing across Europe? This research has been focused on 4 domains: the behaviour toward fulfilling or refusing the vaccination schedule, the lack of belief about the safety and efficacy of vaccines, the searching for information about vaccinations and general attitudes. The domains were identified through exploratory factor analysis, and items were placed under a domain using a factor-loading cut off of greater than 0.3. We chose to look at the following 6 vaccines to assess immunization status: diphtheria, tetanus, and a cellular pertussis; inactivated poliovirus; measles, mumps, and rubella and pneumococcal vaccines. We chose not to include rotavirus because rotavirus vaccine is a relatively recent addition to the schedule recommended by the Public Health Institute in Slovakia.

For this research study, we included demographic items including (age, region, educational level, marital status, relationship to child, number of children in the household, and social status).

The study was designed as the quantitative research based on a standardized questionnaire adapted from the Slovak public health institution (RÚVZ SR). It was modified to analyse attitudes of mothers toward childhood vaccination, their general attitudes to vaccines and the vaccination sources that influence their decision-making. The study was aimed to figure out some of the reasons why mothers today choose not get their children vaccinated. The data collection was held from January to March 2019 to recruit the vaccination attitude of mother of toddler were born in 2017-218.

The research study is based on the 4 domains analysing the impact of the various factors and emotionality on the decision-making about the compulsory vaccination programme for toddlers valid in Slovakia.

1. **Demographic factors influencing the attitudes about vaccination:** There is the impact of demographic indicators on the willingness of parents to get children vaccinated. Most of the mothers who refuse vaccination do not have health care education with lower health literacy about vaccination. On the other hand – the age of the mothers, the number of children that they have had, has a negative correlation with their attitude to pass the vaccination schedule.

2. **General attitudes of mothers to vaccination and subjective perceptions of vaccine risks :** There are many factors influencing the decision making of mothers to get a child vaccinated. We look at the reasons why they refuse the childhood vaccination and thus, risk their children's health.

3. **Effect of information sources on attitudes to vaccination and decision making:** there are wide source of information that today's mothers keep turning to without doing any critical thinking.

4. **Attitude toward collective immunity and vaccine immunization based on personal preferences:** There are anti-vaccination campaigns that try to persuade people that the vaccines are not natural for immunization. They further argue that a vaccination participation should change from compulsory to optional

Hypothesis 1: There is a significant relation between the general attitudes toward vaccination and the decision-making whether or not to get the child vaccinated.

Hypothesis 2: There are various attitudes about vaccination in regards to the refusal to vaccinate their children.

Hypothesis 3: There is a significant relationship between information sources and attitudes to childhood vaccination.

Hypothesis 4: There is a significant relationship and impact of age on attitudes about childhood vaccination.

Coding and statistical analyses of data were done by using the SPSS 7.0 program. Percentages were used to evaluate the parameters of age, region, education, occupational status, the geographic location, and social status. The *t* test was applied to determine differences between the mean attitude to vaccination and scores according to age, health literacy and information sources and general approach to immunization.

The Pearson correlation analysis was used to detect the relationship between attitudes to vaccination, demographic domains, information sources and decision making. The significance in all statistical analyses was defined as $p < 0.05$.

Sample

The sample consisted of 2111 mothers who were taking care of the toddlers that were born during the years 2017-2018. The research data was collected from January 2019 to March 2019 when there is a period of higher doctoral visits due to a higher sickness of the toddlers. It is traditional in Slovakia that mothers take care of their children during this time of the child's life more often than the fathers. In this case, over 90% mothers take care of the children and less than 10% of fathers take a maternity leave to take care about the toddler which lasts for 6 months. It means that the most services and homecare is based on serving the mothers. Table 1 describes the demographic factors of the sample that might have an impact on the attitudes toward vaccination of the toddlers.

Table 1 Demographic characteristics of the sample

Variables/ demographic characteristics	% (N)	Mean	P
Achieved education		3.0	< .168
Secondary school	36,4 / 702		
Bachelor degree	12.9 / 332		
MBA degree	47.4 / 1003		
PhD degree	3.3 / 74		
Age		32.2	< .034
20-25 years	19.7 / 416		
26-30 years	29.7 / 627		
31-40 years	33.4 / 705		< .105
Over 40 years	17.2 / 363		
Residence		3.0	< .004
Village with good level of social services	29.1 / 614		
Village with less served areas and services	10.2 /216		
City providing good level of services	60.7 / 1281		
Social status		2.0	< .036
Married	48.5 / 1129		
Cohabiting	38.5 / 908		< .017
Divorced	13.0 / 74		
Parenting		1.7	< .044
One child	49.2 / 1038		< .012
2 children	40.1 / 858		
3 children	9.2 / 174		< .053
4 or more children	1.7 / 41		
Social status		1.0	< .223
Maternity and parental leave	56.6 / 1194		

Fully Employed	22.4 / 473		
Part-time job	15.7 / 321		
Unemployed	5.3 / 113		
Awareness of vaccination		2.0	< .033
Good knowledge	35.2 / 739		
Low literacy	43.6 / 929		
Poor awareness	21.2 / 443		

RESULTS

The research was focused on the general maternal attitudes toward the vaccination programme including vaccine Infanrix hexa and synflorix/prevenar13 + MMR vaccine. It explored the relationship in the decision-making process about childhood vaccination and the reasons to refuse participating in vaccination.

Using Multivariate Analysis of Variance, which was designed to compare the levels of qualitative variables in several groups in which the base set is decomposed into multiple nominal-type variables, we have identified the following:

Hypothesis 1

There is a significant relation between the general attitudes toward vaccination and decision-making to get the child vaccinated or not.

Education

There were respondents with Bachelor degree (12.9%) and MBA degree (47.4%) and more than half of them agreed that vaccination is important tool to protect health of the population and to build collective immunity. The research has shown there is no correlation between the attitudes about vaccination and education (p=0.142) due to no similarities in the opinion about efficacy of the vaccines between people who passed secondary school and those who have university education.

Health literacy

The research determined that almost 50% of the sample has a low level of health literacy concerning the vaccination. There is significant relationship between awareness/knowledge about vaccination issues versus vaccination attitudes that might be easily influenced by anti-vaccination campaigns and hoax information that is spread via internet. Even people who are knowledgeable about vaccination and immunization are easily influenced by the emotional framing of information against vaccination, that they stop to believe in the efficacy of the vaccine. That is the reason why there is increasing number of well-education people who are beginning to doubt the importance of vaccination.

Place of residence and region

There is correlation between the attitude to the vaccination and place of residence and region (p=0.014). The respondents who are living in the western part of Slovakia have a more modern vaccination attitude compared to other regions. The respondents who live and work in Bratislava, Trnava and Trenčín are less persuaded by anti-vaccination campaigns. On the other hand, there are less children who get vaccinated in the eastern part of Slovakia (Košice, Prešov) and in the middle e.g. in Banská Bystrica due to lack of the health literacy and a lower the quality of life.

Age

There is correlation between the attitude toward vaccination and age (p=0,024). The respondents younger than 24 years old are less responsible toward vaccination (25,4%). The respondents between 24-30 years old are

more likely to consider the efficacy and risks of the vaccine and are more inclined to reject the vaccination schedule (31.2%). The respondents over 30-35 years old make a decision due to framing model of positive and negative impact of the information on the vaccination attitudes (34,7%). The people over 35 are more conservative and they are likely to complete the vaccination program and adhere to the traditional attitudes about the importance of collective immunity and supporting immunization via the vaccines (15,6%).

Social status

There is no correlation between the attitude toward vaccination and social status (p=0.223). The vaccination attitude is not formed by social status. But in this category of social status there is a strong impact of personal experiences or experiences with negative side-effect of the vaccine that make an impact on the decision-making (34.8%).

Number of the children in the household

There is correlation between the attitude toward vaccination and the birth order of the toddler when he or she was born (p=0.044). The mother who has only one child is less likely to do the vaccination schedule in comparison to the families with more than two kids (p=0.012). The fear of side-effect of the vaccine is stronger if the mother is taking care just one child rather than two children. The mother with three and more kids have a more positive attitude to the vaccines (p=0.053) than mother who gave the birth to one child.

Hypothesis 2

There are various attitudes toward vaccination in regards to the refusal to vaccinate their children. The research has shown that there are different attitudes to vaccination and various reasons not to follow through with childhood vaccination due personality, knowledge and the spread of information (p=0,026).

Around 18% of the mothers who absolutely refuse to get their children vaccinated claim it is due emotionality (19.1%), negative personal experiences (24.5%) and poor health literacy or awareness (36.7%) or negative vaccine side-effects (29.8%).

General attitudes link to the quite high vaccines awareness of the Slovak inhabitants. More than 49% of mothers agreed than vaccination can't be replaced by anything else comparing to 34.43% who prefer natural immunization rather than vaccines. On the other hand, the fear of the risks and side-effects of vaccines is stronger than the positive efficacy of the vaccination at 53.76%. 18.23% of the mothers absolutely refuse the vaccination and 23.25% think that vaccine programme is a violation of their human rights. 77.60% agree with the importance of the vaccination, but 34% agreed that the decision making about vaccination should be voluntary. 64.37% of mothers believe that there is a lack of awareness about vaccine side-effects and vaccine risks. 87.30% of the mothers think that paediatricians do not give enough attention and time to their health examination and genetic considerations before using the vaccines. Due to lack of awareness and mutual communication between paediatricians and parents, 49.07% are persuaded that vaccination brings many unknown and undesirable risks. 66.88% mothers expressed opinion that there is no enough good prevention tool of health protection and collective immunity as the vaccination comparing to 27.56% of the mothers who did not agreed. 33.15% thought the vaccination is not the only way how to protect the health of population.

Table 2 General attitudes to vaccination

Concern	Agree	disagree	neutral	p
I prefer natural immunization rather than vaccination	49.69	34.43	14.92	0.057
Vaccination can´t be replaced by anything else.	52.20	30.80	17.00	0.018
The fear of vaccination risks and adverse effects is stronger than efficacy of the vaccines.	53.76	37.04	9.18	0.040
I am absolutely against childhood vaccination.	18.23	77.60	4.17	0.001
Valid vaccination schedule violates human rights.	23.25	71.86	4.87	0.007

I am not against the vaccination, but there should be free decision to get a child vaccinated.	33.96	60.34	5.68	0.013
The vaccination system helps to protect population and prevent fatal disease.	23.87	70.86	5.25	0.004
There is lack of awareness about vaccine side-effects and vaccine risks.	64.37	32.25	11.89	0.066
Any vaccination should be preceded by a health examination and genetic considerations	87.30	7.01	5.68	0.001
Vaccination brings many unknown and undesirable risks.	49.07	33.21	12.98	0.075
I can´t imagine to protect world population without vaccines.	66.88	27.56	5.54	0.082
The vaccination is not the only way how to protect the health of population.	37.15	58.27	8.58	0.112

More than half of the respondents expressed concern that their child might have a serious adverse effect from a vaccination (26.4%) or that any one of the childhood vaccinations might not be safe (11.3%). Overall, 36.58% of the mothers were very or somewhat hesitant about childhood vaccinations, 28.23% and reported delaying a vaccination for their child for different reasons, and 21.5% reported deciding not to have their child get a vaccination for bad experience in the past. 41.47%. They do not trust the safety of the vaccine due negative side-effects after first vaccine shoot.

Table 3 Reasons of parental refusal of the vaccination

Reasons not to get a child vaccinated	%
To many vaccination shoots and impact on the health	18.80 %
High risk of side-vaccine effects and strong fear linked to vaccines	26.40 %
No trust in vaccine safety and building immunization	11.30 %
Lack of information and poor awareness	36.58 %
Bad personal experiences with vaccine	21.50 %
Bad side-effect in the first shoot of vaccine	41.47 %
Benefits of vaccines outweighed the risks	14.21 %

The majority of the respondents were either confident or very confident in vaccine safety (67.0%) and believed that vaccines are important to children's health (67.60%). Similarly, 66% of the sample somewhat or strongly agreed that the benefits of vaccines outweighed the risks. 33% mothers were uncomfortable or very uncomfortable with the number of vaccines that children receive in their first 2 years of life. The most of the mothers would prefer and be comfortable with their child receiving in 1 doctor's visit, 1 to 2 (45%), followed by 3 to 4 (13%), and "whatever the doctor recommends" (42%). Respondents were asked to respond to negative side-effects after passing the basic vaccination schedule. The most common concern reported by the mothers was that it was painful for children to receive multiple shots during 1 doctor's visit (40%). Other concerns reported by 25% of the mothers included headache, temperature, vomiting, diarhea, and 15% of them reported concerns such as chills, anorexia, apathy or aggression.

There are sanctions for not getting a child vaccinated. That is why we asked the mothers how the situation is in a practice. The parents who refused to pass the vaccination programme with their kids reported these consequences: 8,2% financial penalty, 9.4% disdain by the doctor, 11.3% necessity to change the paediatrician, 10.6% problems in entering a nursery school or kindergarten, 5.7% written notice, 13.9% do not care about others opinions. 25% mothers reported that there were no consequences due to refusal of the childhood vaccination.

Hypothesis 3

There is a significant relationship between information sources and attitudes about childhood vaccination.

The research has shown that most of the mothers received information from the paediatrician, but 45% of them search for the information on the internet and blogs. And, they are influenced by different types of information about the vaccination without doing any appropriate critical thinking (p=0.038).

Parents were asked to name the 3 most important sources that have helped them make decisions about vaccinating the toddlers. By far, the most common response was their child's doctor (69.01%). The 45.6% of them used internet browsers, blogs and webpages to search for the information about the vaccination. 28.2% read the references from the medicine and professionals. 11.6% used mass media as the source of the information. 19.6% received information and experiences with vaccination from family members and friends. 10.6% do not care about the opinion of the others and they make a decision by themselves according to own experiences.

Table 4 Trust to medical information in relation to education

Concern	Agree	disagree	Neutral	P
The doctors do not discuss with the parents about vaccination issues.	47.51	42.77	9.7	0.043
Doctors usually do not check health and consider genetic factors before using the vaccines.	62.5	29.5	8.0	0.067
The doctors do not pay attention to the parental fear of vaccine side-effects and risks.	51.7	37.2	11.1	0.124
Doctors are not willing to spend time on mutual communication. They just follow vaccination schedule.	56.8	33.4	9.8	0.055
I usually trust doctors due my lack of the information concerning the vaccines and poor awareness.	62.3	31.8	5.9	0.016

Hypothesis 4

There is the significant relation and the impact of age on attitudes to childhood vaccination (p=0.005). The research has shown that the age together with personal values and knowledge have a strong impact on the positive or negative opinion about the childhood vaccination. Mothers between 26-40 years old agreed that the vaccines are not suitable for everyone (p=0.037) and the decision making should be done by parents (p=0.002).

Table 5 Relation between age and attitude to vaccination

Concern	20-25	26-30	31-40	Over 40	P
The vaccination is a good tool to protect public health and built collective immunity.	25.2	30.2	19.3	25.3	0.041
The vaccination program break with human rights.	29.5	37.4	23.0	13.1	0.028
The vaccination should be free and covered by state.	21.4	26.8	32.3	19.5	0.012
The decision-making about childhood vaccination should be done by parents, not by health policy.	28.9	24.7	25.2	21.2	0.002
Vaccination programme is not suitable for everyone concerning genetic and another factors.	33.7	21.3	22.4	22.6	0.037
There is lack of vaccination awareness and understanding of risks of vaccines.	20.0	19.6	28.3	32.1	0.035
There is lack of mutual communication and discussion about vaccination issues.	15.4	31.8	33.6	15.0	0.084

59.2% of the mother would agree to change compulsory vaccination programme to decision making based on free will of the parents. 33.4% of the mothers would agree to make the vaccination obligatory. 7.4% were not sure about it.

The questionnaire consisted of the following questions to the respondents: If the vaccination programme for the toddler was based on the free will decision making of the parents without any obligation to pass the vaccine schedule, would you get your child vaccinated?

Table 6 presented the answers of the mothers. Only 20% of the mothers are likely to complete the vaccination schedule if it is not obligatory. 15% are absolutely not likely to get a child vaccinated and 20.3% will do so only if the doctor would recommend the vaccines. 35.3% consider the positive and negative aspects of the vaccine before they get a child vaccinated. 5.8% think that the vaccine is too expensive and they can not afford it. 6.7% do not agree it is right that toddlers get too many vaccine shoots at early age. In general, we can say there is no positive willing to get the children vaccinated if the parents have a free choice to do that. There is a great assumption that the number of vaccinated children will dramatically go down.

Table 6 Parental willingness to get a child vaccinated if the vaccines are not obligatory

Parental attitude to the vaccination, if it is not obligatory	%
I will get my child vaccinated for sure	19.9
I will get my child vaccinated not before concerning all risks and vaccine side-effects	35.3
If the doctor recommends the vaccination, I will complete it with my child	20.3
I do not agree with too many vaccine shoots	6.7
The vaccines are too expensive to afford	5.8
I do not trust in the vaccination programme at all	15.1

The research results have shown a great relationship between attitudes to vaccination and emotional feelings concerning vaccine side-effects, vaccine risks and efficacy of the childhood vaccination ($p=0.010$). The respondents had to face bad experiences or to hear about negative vaccine-side effect that made a bad impact on the family situation and the health of the toddler, they less trust the efficacy of the vaccine and they are not likely to get a toddler vaccinated ($p=0.085$). There is an impact of the anti-vaccination campaigns that changes the willingness of the parents to pass the childhood vaccination schedule ($p=0.004$). The emotionality and personal experiences make a great impact on the decision making about the vaccination reported by 72% of the mothers ($p=0.006$).

Table 7 Emotionality and experiences according to attitude to vaccination

Concern	agree	disagree	Neutral	P
I did not have to solve problems after getting my child vaccinated.	61.4	31.8	5.8	0.033
I did not have a bad experience about vaccines, but I know cases with bad side-effects of vaccine	58.8	37.6	3.6	0.085
The anti-vaccination campaigns make a big impact on the decision making and emotionality.	71.9	21.4	6.7	0.004
The emotionality and personal experiences has a influence on my refusal of the vaccination.	57.6	35.2	7.2	0.006
People are more afraid of vaccine side-effects as in the past.	58.7	37.4	3.9	0.0112
There is luck of trust in public health institution and vaccination programme in general.	55.4	38.6	6.0	0.0121

Research limitations

There are some limitations of this study to be considered when interpreting the data. First, the intentional selection process of the participants and smaller sample size implies that the study sample may not be representative of all mothers of toddlers. In addition, focusing on the female attitudes to vaccination and not including fathers in the study may be a limitation. Secondly, the feelings / emotional aspects and their impacts can be analysing from different points of views, we could not cover all of them due to our own personal capacities to do this research. We had no financial support and a limited time-schedule to complete the research.

DISCUSSION

Research including sample of 2111 mothers taking care of the toddlers, has shown there is positive attitude to the vaccination among Slovak population in general because more than 85% is covered by obligatory vaccine

programmes. But there is a trend of the modern generation of the mothers, who are less likely to get a child vaccinated due various reasons and different opinions about efficacy of the vaccine and fear of vaccine side-effects. 33% of who have negative attitude to childhood vaccination, these mothers are against MMR vaccine that is connected with a lot of anti-vaccination campaigns spread on the internet

The majority of the mothers were confident in vaccine safety (81.0%) and believed that vaccines are important to protect children's health (77.60%) and eliminate fatal disease (67.3%). More than 60% of them somewhat or strongly agreed that the benefits of vaccines outweighed the risks. Most mothers (33%) were uncomfortable or with the number of vaccines that children receive in their first 2 years of life and the low awareness about the vaccination (62.7%). There is impact of the anti-vaccination campaigns that change the willingness of the parents to pass the childhood vaccination schedule ($p=0.004$). The research has shown that the most of the mothers received information from the paediatrician (62%), but 45% of them search for the information on the internet and blogs and they are influenced by different types of information about the vaccination without critical thinking ($p=0.038$). The emotionality and personal experiences make a great impact on the decision making about the vaccination reported by 72% of the mothers ($p=0.006$).

59.2% of the mothers would prefer to change vaccination programme form obligatory/ compulsory to free decision making as the parents are legal guardians having a duty to care for the well-being and health of the child. 33.4% of the mothers did not agree to make vaccination obligatory. The research has shown if the vaccine schedule is based on the free will of parents, it would cause a fatal impact on the collective immunity and health of the population because the number of people who get a vaccinated would be dramatically decreased. Only 20% of the mothers are likely to pass the vaccination schedule if it is not obligatory. 15% are absolutely no likely to get a child vaccinated and 20.3% will do so only if the doctor recommend the vaccines.
The refusal to vaccinate children may be influenced by concerns about vaccination in general. These are things like low perceived likelihood and severity of the infectious diseases, and a trusting relationship with a natural healer or another respected person who doubts vaccination safety and effectiveness (Benin, 2006). Hilton et al., 2006 showed that some parents fear an overload of the immune system caused by a combination vaccines. Additionally, the perception that vaccination is more risky than non-immunization (Smailbegovic, Laing, Bedford, 2003) and issues of harm, distrust and access might play a role in refusing childhood vaccination (Mills, Jadad, Ross, Wilson, 2005).

The reasons why the mothers do not get a child vaccinated are based on the various factors. The most common factor is low health literacy and poor awareness about vaccines (36%) and the second is the fear of negative side-effects of the vaccine reported by 26% of the mothers that required harm reduction that they do not want to face (even hypothetically). Only 14% of the mothers believe that benefits of vaccines outweighed the risks and 41% of them are afraid or had to face negative reactions of the toddler after vaccine (pain, temperature, vomiting, apathy, baby crying, anorexia and so on). There is significant correlation between attitudes to vaccination and emotionality ($p=0.010$), personal experiences ($p=0.006$), family or friends experiences ($p=0.024$) and information sources ($p=0.002$).

In years 2018 and 2019 Slovakia had to face the epidemic of the measles due to irresponsible behaviour of the parents who did not get their children vaccinated. 20 years passed without almost any cases of measles and the trend of not completing the vaccination schedule is increasing. There are also parental voices asking for free decision-making about the vaccination. There are amendments of the Act and preventive programmes in an effort to protect the health of the population and stop the decline of collective immunity in Slovakia. Tománek (2018) affirms that family values are the most important in shaping any attitudes and therefore it is important to raise awareness.

On the other hand, Novotná (2018) developed concrete methods working with families that could help to overcome misunderstanding and meaningless barriers that can have a negative impact on the social status of the clients or family members and increase their quality of the life. This approach is supplemented by theory of authors Šmidová and Hamarová (2018) who point to an aspect of love that can help to cope with the burden of life. The same can be implemented in the forming of the attitudes toward childhood vaccination based on the love and protection.

CONCLUSION

Vaccination in the Slovak Republic reaches more than 90% of the population, but there is an increasing number of modern attitudes to vaccination reflecting negative or refusing attitude to vaccination of children under three years. The decline in vaccinated children in some regions of Slovakia caused the case of measles infected, especially in eastern Slovakia, to appear after 20 years of hardly any measles. In an effort to protect the health of the population, the Government of the Slovak Republic has taken several measures to stop the trend not to vaccinate the children. One of the conditions to attend a pre-primary education is that child has to pass a vaccination schedule; except for children whose health is an indication for the vaccine. We are faced with different attitudes towards vaccination. On one hand, the negative attitude towards vaccination is reinforced by controversial opinions that prevail among doctors and professionals who disagree on the benefits and risks of vaccination. In addition, further aggravating the situation is in regards to the notion of collective immunity and health protection of the population. Research has shown that attitudes to vaccination are based on several factors, including: general awareness of vaccination, health literacy, personal experience of the negative effects of vaccination, emotionality and the spread of hoax information over the Internet, or the impact of anti-vaccination campaigns.

Conflict of interests

The authors have no conflicts of interest to declare. The manuscript is original and has not been previously published anywhere else, and it is not being considered for publication in another journal.

Ethical considerations

All respondents - mothers involved in the research were informed about the study goals before the data collection. It was emphasized that participation is voluntary and anonymous. If they fulfil the questionnaire they agree with the participation in the research automatically. The study was approved by the St. Elisabeth University of Health and Social Sciences in Bratislava.

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SUPPLY CHAIN MANAGEMENT ISSUES AND CHALLENGES FOR HEALTHCARE PRODUCTS AND SERVICES DURING AND AFTER NATURAL DISASTERS

Carlos Galindo, University of Houston-Clear Lake
Ashish Chandra, University of Houston-Clear Lake

ABSTRACT

Supply chain management, under normal circumstances, focuses on optimizing operations to maximize profit. During a disaster situation the focus shifts to minimize the number of casualties. Different aspects of emergency preparedness and response are reviewed as well as factors that affect supply chains during disaster situations. The implementation of supply chains following natural disasters can be difficult due to the volume of people involved in the process, who are often operating under abnormal circumstances. This paper provides awareness to current supply chain management issues during disaster situations and also provides suggestions that could help make the process more efficient during those unfortunate situations.

INTRODUCTION

Having an appropriate plan in place when a natural disaster strikes can help can be the difference between disasters becoming catastrophes. A Supply Chain is a network with a sequence of processes involved in the production and distribution of a commodity. This network includes different activities, organizations, people, information and resources. A well designed and implemented supply chain can make an organization successful by helping them control costs, streamline operations and reduce lead times. These same concepts can be used to mitigate damage and provide relief after natural disasters.

Since 2005 FEMA has granted 77.625 Billion dollars in disaster assistance and preparedness grants. Of the total 47% was spent on Public Assistance Grants, 33% on Preparedness Grants, 10% on Disaster Mitigation Grants, 9% on Fire Grants, and 1% on Public Assistance (FEMA, 2019). In response to these events, Congress passed two supplemental spending bills appropriating $34.5 billion in post-disaster funds and forgiving $16 billion of debt for the National Flood Insurance Program (NFIP) and also approved a two-year budget that included an additional $90 billion for disaster rebuilding. The total spending in response to the 2017 natural disasters was over $130 billion (Lingle, Kousky, and Shabman, 2018).

Some Statistics of Recent Natural Disasters (NOAA, 2019):

Cost of Weather and Climate Disasters since 2005 (In Billion Dollars) (NOAA, 2019)						
Disaster Type	**Number of Events**	**% Frequency**	**CPI Adjusted Losses**	**% of Total Losses**	**Avg. Event Cost**	**Deaths**
Drought	13	8.8%	$104.8	9.4%	$8.1	286
Flooding	19	12.8%	$54.2	4.9%	$3.2	255
Freeze	3	2%	$5.5	0.5%	$1.8	1
Severe Storm	81	54.7%	$178.4	16.0%	$2.2	1,015
Tropical Cyclone	17	11.5%	$697.2	62.7%	$41.0	5,722
Wildfire	10	6.8%	$61.3	5.5%	$6.1	272
Winter Storm	5	3.4%	$11.2	1%	$2.2	113
Total	**148**	**100%**	**$1,112.6**	**100%**	**$7.6**	**7,664**

Natural Disasters

The most recent notable examples happened in 2017 one of the most active years regarding natural disasters. These include *Hurricane Harvey*, with rainfall that lasted over seven days, receiving the largest amount of rainwater ever recorded in the United States; receiving more than 60 inches. *Hurricane Harvey* is the second costliest hurricane in US history after Hurricane Katrina. Harvey's death toll estimated of at least 68 people, 33,800 people displaced, 336,000 customers without power, 176,000 homes destroyed and overall damages totaling over $125 Billion (Davis and Ho, 2018).

Hurricane Irma

Maintained intense winds in excess of 185 MPH for 37 hours and is recorded as the second most powerful storm with regards of wind speed, only to follow Hurricane Allen's record set in 1980 of 190 MPH (Scott, 2017).

Hurricane Maria

Resulted in severe devastation in Puerto Rico including: damage to 100% of the 22 power distribution system, 95% of the cell phone grid, 44% left without drinking water, damage to the wastewater system, loss of key infrastructure such as roads and bridges blocked by debris and mudslides, more than 427,000 housing units destroyed, loss of 80% of planted crops, and the closure of hundreds of schools and thousands of businesses (Rossello & Defense Media Activity, 2017).

California wildfires

The historic wildfires across California tore through the state, burning 1.2 million acres of land creating blazes and forcing mandatory evacuations. The fires destroyed more than 10,800 structures, killing at least 46 people (Tierney, 2018)

Parties involved and their roles during natural disasters

Local government

Maintains control of all assets used in the response and recovery efforts, regardless of the source of those assets. Its disaster response responsibilities include acting as first provider of emergency response services, activating the Emergency Operations Center (EOC) and Emergency Management Plan (EMP), coordinating the response with government agencies, public and private organizations and requesting the State and or Federal assistance among many others (FEMA, ND).

First responders

The specific roles of first responders vary by department and professional training. Ideally, all first responders should have a basic knowledge of communication needs, triage techniques, and hazard identification. Most first responders are part of the local Police, Fire Fighters, Coast Guard and EMS among others. It depends on each State's legislation who trains first responders.

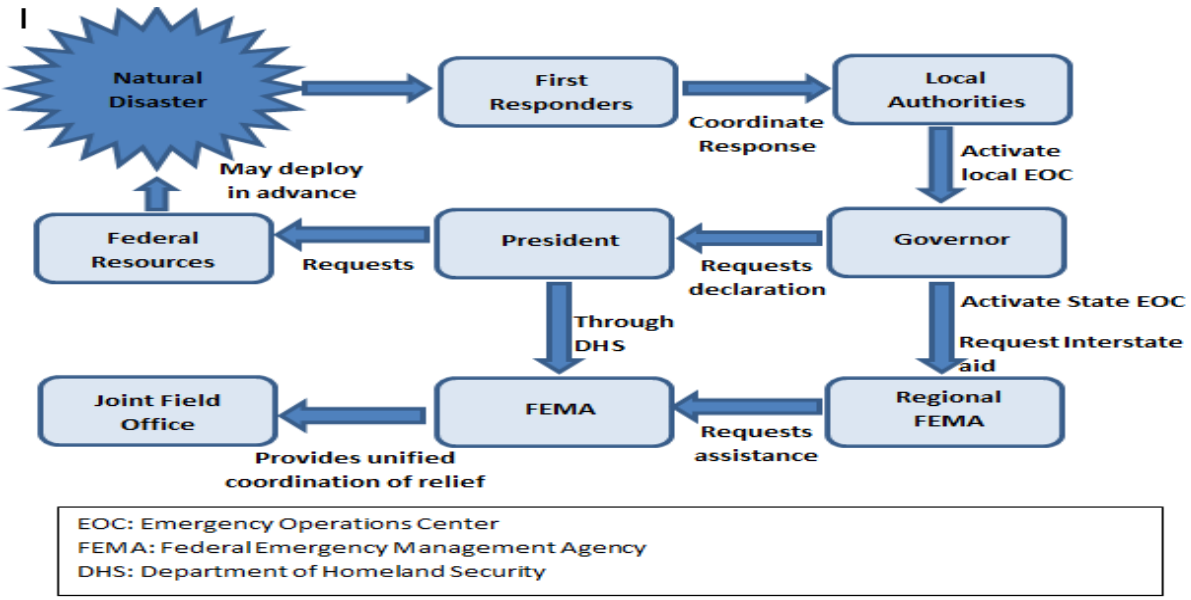
State government

Serves as agents for the local jurisdictions if Federal disaster assistance is needed but cannot directly access Federal programs. Their responsibilities include, monitoring the situation, activating the State EOC to coordinate state assistance, determine if the situation is beyond the capabilities of the State and assess if Federal assistance is needed, proclaim a state of emergency by the governor activating the State's Disaster Preparedness Plan and requesting federal assistance among many others (FEMA,ND).

Federal Emergency Management Agency (FEMA)

FEMA is the Federal Agency that coordinates the activation and implementation of the Federal Response Plan (FRP), States work with FEMA to access Federal programs and support. FEMA uses the funds received from the federal government to fund three programs: Public Assistance; used to repair and rebuild local government buildings and infrastructure, Individual Assistance, and the Hazard Mitigation Grant Program; used for reducing future disaster losses through mitigation measures such as property buyouts and home elevations. (Lingle, Kousky, and Shabman, 2018).

Overview of the National Response Framework (Department of the Army, 2010)



U.S. armed forces

In most natural disaster situations Federal, State and Local governments require the assistance of the US Armed forces due to their capabilities, abilities to quickly respond and their particular expertise on operating in the field. The Department of Defense (DoD) offers critical capabilities in search and rescue, engineering, transportation, aviation, communications, and medical support that most organizations can provide or at least at the same scale. The DoD is the most utilized agency for domestic disaster relief efforts, tasked with between 38% to 49% of all mission assignments. FEMA's utilization of DoD is predominantly in transportation; public works and engineering; logistics management and resource support; search and rescue; and external affairs (Davis and Ho, 2018).

Army core of engineers

Their primary function during natural disasters include handling issues with civilian infrastructure, such as assessment of damage, maintenance and repair of dams, waterways, and bridges (U.S. Army Corps of Engineers, 2018). However; despite their vital importance, the Corps of Engineers accounts for no more than 41% of the DoD mission assignments (Davis, Ho, 2018).

National guard

Is a critical resource in cases of immediate state response, because in those cases they will be commanded and controlled by the state governor (Davis and Ho, 2018).

International organizations

Operate across multiple countries or regions as opposed to operating in a single country. They typically serve developing countries and regions, frequently conducting work in areas related to development, humanitarian assistance, and advocacy (Anheier, 2005). The US had never needed humanitarian assistance and relief before Hurricane Katrina, where more than one dozen INGOs (Arroyave, Cooper, and Elkenberry, 2007). The WHO established the Interagency Emergency Health Kit (IEHK) which provides a standard package of medicines and simple medical devices for the use of aid agencies in cases of emergencies, natural disasters and armed conflicts. The latest version was revised in 2017 and can serve the healthcare needs of 10,000 people for 3 months. (WHO, 2017)

American Red Cross

Is the NGO that has helped the most during disaster relief operations. The assistance operations the American Red Cross provides includes, home fire relief, hurricane relief, wildfire relief, flood relief, earthquake relief, and winter storm relief (American National Red Cross, 2019). Recently, The American Red Cross provided $314 Million in disaster relief assistance during Super Storm Sandy, $345 Million during Hurricane Harvey, and $37 Million during Hurricane Irma (American National Red Cross, 2019).

Volunteers

Are crucial in most disaster relief efforts and having well trained volunteers is critical in providing emergency response. Volunteers trained to provide health care relief during disaster situations are scarce and must be proficient in Disaster Medicine, which involves the delivery of care under austere conditions, often with limited resources (Merchant, Leigh, and Lurie, 2010).

Supply chain design and implementation during natural disaster situations

Supply chains during disaster situations are transient supply chains meaning that they are finite and are deployed in response to a specific event. Once the event is completed the supply chain can be disbanded. Management needs to consider all supply chain lifecycle stages (planning, initiation, ramp-up, steady state, termination/transformation during these disaster situations and learn from each event so they can be better prepared for the next one (Day, et al., 2012).

In order to design a supply chain network, a planning team must be established well before an actual disaster really happens. They must design and implement recovery plans and analyze the capabilities and hazards to develop a mitigation plan. This team must analyze and determine the direction the resources will flow and how it will be controlled. There must be a plan in place on how to ensure continuity of supply chain management as well. Anecdotally, large metropolitan areas in the country do have some plans in place and unfortunately a disaster can happen in smaller towns as well which can be severely affected.

The ***first step*** in the design of the supply chain plan is to identify the resources needed. The ***second step*** is to identify all critical facilities within the supply chain. This includes identifying the locations within the affected areas that will need access to emergency resources. They will include channel design, communications systems, sourcing decisions and inventory management strategies (Helferich and Cook, 2002). The ***third step*** is setting the maximum response time goals for access to emergency resources and minimum distances between secure storage facilities and the final destinations.

Supply Chains during natural disasters must include facility location, transportation, relief distribution, stock pre-positioning and evacuation among many others (Caunhye, Nie, and Pokharel, 2012). The main objectives to accomplish are the minimization of the maximum vehicle route travelling time, the minimization of relief distribution costs, and the maximization of the minimum route reliability (Wang, Du, and Ma, 2014). ***Finally***, the planning team must evaluate and act on their observations which will help them decide on further actions to take such as evaluating life safety, ensure property protection and public services restoration (Hale and Moberg, 2005).

Modeling, optimization and simulation are the major tools to identify the number and approximate location of emergency resource storage facilities and distribution centers. Facility location problems are of two types, selecting a facility from existing facilities and selecting the location for building a new facility. Location / Allocation problems are highly uncertain in terms of travel time, cost and demand (Safeer et al, 2014).

Regarding providing medical treatment detailed plans on how to set up field hospitals must be in place to attend the needs of the critically ill. These must include several locations where they might be set up as well as sufficient transportation means to and from these facilities. Hospitals must work with local authorities to have their own plans in place to deal with different types of scenarios and have the ability of hit the floor running after disaster strikes.

Supply chain management issues and challenges during disaster situations

Geographical issues

In order for an event to be categorized as a disaster considerable damage must occur. To be a disaster they must occur in proximity to a concentration of people or assets (Coleman, 2006). A perfect example of this is what is known as the "Tunguska Event" from 1908, where an asteroid with a diameter close to a mile impacted the Siberia frozen tundra knocking down trees for 31 miles and breaking windows hundreds of miles away (Chyba, Thomas, and Zahnle, 1993). The energy released from the impact was more than that of 1,000 Hiroshima atomic bombs with the potential to devastate entire cities. However, it didn't cause any casualties because it occurred in such an uninhabited zone. (Chyba, Thomas, and Zahnle, 1993). Tropical Cyclones impacting the Northeast region are more prone to affect multiple cities and cause more damage due to the proximity of largely populated areas. On the other hand, when a hurricane impacts a Florida city, it has to travel over land to reach the next city, causing it to decrease in intensity (Ellis, Sylvester, and Trepanier, 2015).

Pharmaceuticals products

Pharmaceuticals are one of the most important components of healthcare and are very needed after natural disasters. The WHO publishes a model list that is constantly updated and can be used as a global standard guide to help country authorities develop their own national Emergency Medicine Lists (EML) (Bennett et al, 2011).

Medicine donations and their expiration dates

Are vital during emergency situations, however, donations create several issues. Many countries impacted by natural disasters report receiving irrelevant or expired drugs among other challenges (Stehmann, 2002). The most important aspect regarding drug donations is expiration dates. A clear example of the costs and repercussions of receiving unsuitable drugs is what Sri Lanka experienced after suffering from a Tsunami in 2005. According to data from the Sri Lankan Medical Supplies Division, they received 3,500 truckloads of pharmaceutical donations. Of the total amount of pharmaceuticals only 10% were on the Ministry of Health EML, 5% were expired on arrival or close to expire and 62% were labeled in a language other than English that created confusion and 25% of them were destroyed a year after due to being expired, still unknown or unnecessary (Bennett, et al., 2011). Another example of the cost of unsuitable drug donations is what happened in Bosnia and Herzegovina were 17,000 metric tons of donated drugs had to be destroyed costing the recipient country approximately $34 million dollars (Berckmans, et al, 1997). According to the WHO, all donated medicines should be obtained from reliable sources that comply with quality standards from their country of origin, be in a language that can be understood and have a remaining shelf life of at least one year after they arrive at the disaster zone (Bennett et al., 2011).

Procurement

In most cases the drugs needed are donated by government agencies, hospitals, private organizations, international organizations, NGO's and civilians. Governments and international organizations have established criteria to prequalify manufacturers, suppliers and quality assurance laboratories to improve the responsiveness, flexibility and efficiency of the pharmaceutical supply chain during disaster relief situations (Bennett, et al., 2011).

Storage

Drug donations require storage space, security and people in charge of guarding, distributing and disposing them (Bennett, et al., 2011). The WHO created the "Guide to good storage practices for pharmaceuticals". According to this guide, storage areas should be of sufficient capacity to allow the orderly storage of the various categories of materials and products, they should be designed or adapted to ensure good storage conditions, and they should be clean, dry and maintained within acceptable temperature limits (WHO, 2003). Special storage conditions are required on the label (temperature, relative humidity, etc.) and should be provided, checked, monitored and recorded (WHO, 2003). Materials and pharmaceutical products should be stored in conditions which assure that their quality is maintained, stock should be appropriately rotated, and they should be properly disposed when they are not useful anymore.

Personnel

Another crucial component is managing what personnel should be in charge of procuring, storing, managing and distributing drugs. According to the WHO guide all personnel should receive proper training in relation to good storage practice, regulations, procedures and safety (WHO, 2003).

Distribution

Relief distribution is the efficient and controlled dissemination of relief goods such as, food, medicine, equipment and other related items to provide the resources needed by the wounded and affected population. Distribution in a post disaster environment comes with some challenges like demand variations, link and facility damage and shortages (Safeer, et al., 2014). Relief distribution operations are time and cost dependent, that is why most distribution models take into consideration relief distribution cost & time, response time, resource allocation, demand satisfaction, unmet demand, number of wounded people waiting and total lives savings (Safeer, et al., 2014). To reduce the response time in emergency cases, organizations hold critical supplies in stock at nearby strategic locations (Stock prepositioning) to reduce delivery times, cut transportation costs and improve overall response times.

Healthcare services

When a disaster strikes sometimes the devastation is of such magnitude that the institutions that provide healthcare services are unable to function properly or in some cases at all. In the wake of Hurricane Katrina Charity Hospital in New Orleans was able to operate and had to improvise care for days prior to complete evacuation of their critically ill patients. According to an article from the Task Force for Mass Critical Care summit in Chicago IL, on January 2007; 10 days is a reasonable timeframe to provide care because victims' critical care needs are not expected to rapidly resolve for most scenarios. The authors determine that the suggested 10-day period to provide critical care to the ill is intended to ensure that life-sustaining care can be maintained throughout the entire period until rescue is completed (Rubinson, et al., 2008).

They also established that the critical care provided should include, when applicable, the following: (1) mechanical ventilation, (2) IV fluid resuscitation, (3) vasopressor administration, (4) antidote or antimicrobial administration for specific diseases, (5) sedation and analgesia, (6) select practices to reduce adverse consequences of critical illness and critical care delivery, and (7) optimal therapeutics and interventions, such as renal replacement therapy and nutrition for patients unable to take food by mouth, if warranted by hospital or regional preference (Rubinson, et al., 2008).

Local hospitals

Hospitals are required to have an Emergency Operations Plan (EOP) that describes how the organization will respond to a potential emergency situation. The EOP must address seven key areas: 1) Communication 2) Resources and Assets 3) Safety and Security 4) Staff Responsibilities 5) Utilities Management 6) Patient and Clinical Support Services 7) Regular Testing and Evaluation (Accruent, 2015).

Although hospitals are required to have an EOP, even in normal circumstances they operate near full capacity to maximize profit and serve as many patients as possible. In most urban areas, hospitals and trauma centers

have problems dealing with a multiple-car highway crash, much less the volume of patients likely to result from a large-scale disaster (The National Academy Press, 2007). Some studies have indicated that the number of available beds, ventilators, isolation rooms, and pharmaceuticals may be insufficient to care for victims of a large-scale disaster (Kaji and Lewis, 2006).

The limiting factor in the ability to respond to a disaster will vary by hospital, region and by type of disaster. An important limiting factor is the availability of specialists who can treat the types of cases resulting from a disaster event. Another limiting factor is physical space but it can be solved by using hallways and all nonclinical areas to treat the victims.

Field hospitals

When the population affected by the disaster needs to be treated in the location of the disaster, because there are no hospitals near or the patients are critically ill, a field hospital is required. According to the WHO field hospitals are "mobile infrastructures that provides healthcare services, that can be deployed, installed, expanded and dismantled anywhere with relatively ease which can provide the required healthcare services for a determined period of time." (WHO-PAHO, 2003)

These hospitals must serve three purposes: 1) Provide immediate emergency medical attention 2) Function as a provisional healthcare center to meet the needs of the affected population suffering from healthcare problems related to the disaster 3) Provide follow up treatment and treatment for people with chronic diseases and normal healthcare needs while permanent healthcare facilities are up and running. (WHO- PAHO, 2003)

Field hospitals must be able to operate in site during the first 24 hours, have the capacity to operate autonomously, and offer medical attention comparable to the one received before the disaster in the region or country where it's located. From day 3 to 15 the field hospital needs to have full operational capability with minimum local assistance, have basic knowledge of the language & culture of the area, adequate technology, and sustainability. From day 60 onwards be able to provide most medical services required by the affected population until the reestablishment of normal healthcare providers in the region (WHO-PAHO, 2003).

Information technology

One of the major challenges medical staff face when working in a disaster situation is dealing with the lack of sufficient resources, lack of organization, and dealing with surrounding chaos created by the disaster. Chaos combined with lack of organization and control prompts inefficient utilization of scarce resources. To prevent this, information must constantly be gathered, updated and analyzed to make better decisions regarding hospital operations and patient care. One example of this was the field hospital set up by the Israeli Defense Forces Medical Corps after the 2010 earthquake that devastated Haiti (Levy, et al., 2010).

Their IT system was able to summarize admissions, discharges, surgeries, births, imaging results, patient distribution by department, occupancy rates, patient injury severity, patient current status and in-hospital deaths by day, hour and in total (Levy, et al., 2010). It also helped monitoring the flow of patients within the hospital with information regarding dates and times of entry and discharge. This information system was designed to meet two primary objectives: 1) to serve as an administrative platform for the field hospital and to enable hospital command to make informed operational decisions based on real-time accurate information 2) to enable advanced case management at the individual patient level by establishing an electronic medical record (Levy, et al., 2010).

Transportation

After the disaster, survivors and local authorities have the immediate task of transporting the injured to be properly treated. Most researchers that have generated transportation models for disaster relief situations focus on minimizing the travel cost and travel time which leads to improvement in overall response by identifying the best routes with minimum risk of transportation and best response times. Most researchers use single objective functions

to optimize transportation operations. These functions take into consideration travel cost, loading and unloading time, distance, travel time, evacuation time, distance, quantity and risk, to name a few (Safeer, et al, 2014).

Quarantine

It is used when individuals are exposed to a disease that is highly dangerous and contagious. Having clear policies on how to efficiently design and implement quarantines can save many lives. Some aspects to consider during these situations are: the number of suspected, probable and confirmed cases, as well as whether cases have well defined exposure risks, the potential of new exposures each case has been in contact with, the type of transmission (airborne, fomite, droplet, contact, etc.), how many generations of transmissions have occurred and the morbidity and case fatality rate of the epidemic (Cetron, et al., 2004).

Epidemics

Natural disasters have a strong relationship with communicable diseases. Risk for communicable disease transmission after disasters is associated primarily with the size and characteristics of the population displaced, proximity of safe water and functioning latrines, nutritional status of the displaced population, level of immunity to vaccine preventable diseases such as measles, and access to health care services. Diarrhea and Cholera outbreaks can easily occur when drinking water has been contaminated especially after flooding. Although the risk for diarrhea outbreaks following natural disasters is higher in developing countries than in industrialized ones, norovirus, salmonella and cholera were confirmed among Hurricane Katrina evacuees in the United States. (Watson, Gayer, and Conolly, 2007).

Interruption of services

Natural disasters may disrupt basic services like drinkable water, sewage, electricity, and telecommunications. The destruction and interruption of basic services can cause a plethora of problems for the affected population. The longest stretch to 95 percent restoration since 2004 was in Louisiana after Hurricane Katrina, where local utilities had power restored to only three-quarters of their customers after 23 days before Hurricane Rita hit and caused additional outages (SFGATE, 2012). It took Texas utilities 16 days to restore power to 95 percent of those who lost it during Rita; Mississippi utilities needed 15 days after Katrina; Florida and Texas utilities needed 14 days after Wilma and Ike (SFGATE, 2012). Having a power outage for that many days would make it difficult to operate and field hospital without having their own power generators.

Suggestions for supply chain management during and after natural disasters

Planning

The use of optimization models to create best emergency supply chains possible should me a staple on disaster management plans. Major medical infrastructure loss and supply chain disruptions should be accounted for in the emergency management plans. *Develop* scenario-based susceptibility assessments to determine potential weaknesses to the health sector infrastructure. *Pre-identify* shelters, facilities or locations for field hospitals where specialized care will be provided would help make the recovery efforts much easier. *Create* a database/registry where civilians with specific skills can register would be beneficial to more readily identify and reach them for their assistance in the recovery. *Create* a database/registry where people with access to off road vehicles, boats, etc. like the "Cajun Navy". This will allow vetting those vehicles to serve as additional modes of transportation when the authorities' capabilities are surpassed.

Coordination

Have clear chain of command and that all parties involved have good coordination among all of them. Authorities need to establish standard procedures so when a disaster happens so there is no variation across state lines which can foster easier cooperation among all parties. Most hospitals normally work near full capacity and they should have a standard coordinated plan with neighboring cities/states in order to have the transfer of victims as efficiently and smoothly as possible.

Organization

The use of basic electronic medical records systems like the Israeli Forces used in the 2010 Haiti Earthquake should be mandatory when providing healthcare relief. Updated, reliable and sharable information is paramount to provide best health care treatment to the victims of the disaster. Nationwide healthcare information integration is necessary to facilitate healthcare data and medical records for easy sharing and portability.

Training

Virtual reality training should be an essential part of the training for all the people involved in providing disaster relief because they can be better prepared to handle most issues difficult to replicate before a natural disaster. Conducting volunteer training and credentialing beforehand to have them ready to assist during the disaster relief will help save time.

Communication

Having proper communication channels and clear messages is very important during disaster situations. Better cooperation with the news media is important to avoid misinformation. The media helps disseminate official information regarding the disaster, give information to keep the population safe and direct civilians to where and how they can assist the disaster relief efforts. Social media corporations should vet information shared in their platforms in order to prevent false reports being shared creating mass panic and unnecessary chaos.

CONCLUSION

The only resource authorities have to minimize loss especially human lives in a natural disaster situation is through well designed and executed evacuation, emergency contingency and preparedness plans. Different critical aspects regarding supply chain management like the ones covered in this article need to be considered when planning and implementing healthcare relief and assistance during natural disaster situations. However, there is hope for the future with technology advancements, authorities will be able to better face these extreme situations with the use of new technology on monitoring, forecasting and detecting natural disasters before they occur as well as using predictive analysis and modelling to plan as best as possible for these natural disasters once they occur.

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THE INTEGRATION OF CHILDREN WITH DOWN SYNDROME IN MAINSTREAM SCHOOLS: PARENTS' EXPERIENCES, NEEDS AND EXPECTATIONS IN SLOVAKIA

Libusa Radkova, St. Elisabeth University
Lucia Ludvigh Cintulova, St. Elisabeth University
Betty Toth, St. Elisabeth University

ABSTRACT

Our research shows the main problems with integration in Slovakia, the benefits of integration for children with Down syndrom, but also benefits for their schoolmates., proportion of integrated children, problems with special assistents of teachers and proportion of them, material and personal problems during integration. Research covers about 10 % of all the population of children with Down syndrom in school age.
Only 25% of children in the sample are integrated into the classroom during all lessons. Although the law guarantees the integration of all children with special needs, generaly only about 10% of children with Down syndrome are fully integrated. Due to lack of funding, teacher assistants are not allocated to schools and many times integration is hampered by the reluctance of school heads and teachers. Children are rejected and parents are forced to put their child in special schools.

INTRODUCTION

Down syndrome, also known as trisomy 21, is a genetic disorder caused by the presence of all or part of chromosome 21. (Patterson, D 2009) It is usually associated with a delay in physical growth, mild to moderate mental disability, and facial features. (Weijerman, ME; de Winter, JP, 2010). The average IQ of a young adult with Down syndrome is 50, which is equal to the mental abilities of an 8- or 9-year-old child, but this can vary greatly (Malt, EA; Dahl, RC; Haugsand, TM; Ulvestad, IH; Emilsen, NM) Hansen, B; Cardenas, YE; Skøld, RO; Thorsen, AT; Davidsen, EM, 2013).

With a diagnosis of Down syndrome implying severe sub normality prior to the 1970's and therefore 'ineducability', it is not surprising that mainstream provision for these children has not always met with common consensus amongst teachers. Attitudes and beliefs are notoriously slow to change. As a result, children with Down syndrome may still be considered by some based on stereotypes often related to outdated information and approaches. Even though there is now evidence to indicate the wide range of intellectual ability to be found amongst such children, the stereotypes are slow to change. There are now even published reports of their successful integration into mainstream classes (Lorenz, 1985, Bird and Buckley, 1994).

There is no cure for Down syndrome. Education and proper care have been shown to improve quality of life. Roizen, NJ; Patterson, D ,2003).. Some children with Down syndrome are educated in typical school classes, while others require more specialized education ˇ(National Association for Down Syndrome, 2012.)
Some individuals with Down syndrome graduate from high school, and a few attend post secondary education (Steinbock,, 2011). In adulthood, about 20% of those with Down syndrom in the USA are actively employed in some capacity. Many are employed in a sheltered work environment. (National Association for Down Syndrome, 2012.) Support toward their work is often subsidized and they often need legal assistance for their lives. Kliegma, R.M. (2011). With proper health care, life expectancy is around 50 to 60 years in the developed world. (Malt, EA; Dahl, RC; Haugsand, TM; Ulvestad, IH; Emilsen, NM; Hansen, B; Cardenas, YE; Skøld, RO; Thorsen, AT; Davidsen, EM 2013)

Down syndrome is one of the most common chromosome abnormalities in humans.. (Malt, EA; Dahl, RC; Haugsand, TM; Ulvestad, IH; Emilsen, NM; Hansen, B; Cardenas, YE; Skøld, RO; Thorsen, AT; Davidsen, EM 2013)

It occurs in about one per 1,000 babies born each year. (Weijerman, ME; de Winter, JP , 2010). In 2015, Down syndrome was present in 5.4 million individuals globally and resulted in 27,000 deaths, down from 43,000 deaths in 1990. (GBD, 2013) The impact of teachers' attitudes and expectations on pupils is well documented in literature. Studies such as Webster and McConnell (1987) and Hegarty (1993) suggest that children tend to meet their teachers' expectations. In addition to the extent to which this information is communicated the children perceive the same way that their peers perceive matters. (Carpenter, 1995). Kunsweiler (1982) found that real growth in teacher attitudes is a prerequisite for successful integration. In fact, attitudes are more important than the degree of disability. This view is supported by Beveridge (1993) and Carpenter (1995), who argue that school philosophy and employee access are critical factors for successful integration.

Integration of children with Down syndrom in Slovakia has been a subject of attention and since it has been enacted for 10 years. Yet not very much of our conditions for integration have examined the experiences of parents as their children have been in the mainstream schools.

The purpose of this study was to identify those factors that may affect the outcome of the full integration of Down Syndrome children into mainstream classes. We also want to try to respond in part to the perceived needs of children and their parents.

The specific objectives wer to explore with the closed and semi-open questionnaires, the experiences, expectations, advantages and disadvantages of integration through the eyes of parents of children with Down syndrome who are attending mainstream elementary schools with multiple levels of integration.

METHODOLOGY

We gave the questionnaire to members of the Down syndrome association in Slovakia. We received responses from 60 of them. The sample is not randomized. We assume that respondents/parents who have the most extensive knowledge of Down Syndrome responded because they of their active engagement in the association. At the same time, these parents, thanks to the association, have made the greatest effort to integrate their children. For this reason, we do not consider them a representative sample. It is estomated that 30-60 children with Down syndromare are born each year in Slovakia. The expected number of children aged 6-15 with Down syndrome in Slovakia is 600 children. Our sample covers about 10% of them.

The research sample consists of 60 respondents, including 54 women and 6 men. They are all parents of a child with Down syndrome.

RESULTS

Table 1 Number of respondents

	N	%
women	54	90
men	6	10
total	60	100

Mothers of children with Down syndrome were the most willing to fill in the questionnaire. They made up 90% of our sample.

Table 2 The current age of a child with Down syndrome

	Age	%
6-8 years old	14	23,3
9-11 years old	18	30,0
12-15 years old	14	23,3

Mean age is 13,62 years.Children with Down syndrome, whose parents were respondents to our research, were at primary school at the age of 6-15 years.

Table 3 Age of parents

mothers		**fathers**	
	Age		**Age**
	25-53 years		31-72 years
Mean	**43,62 years**	**Mean**	**46,31 years**

Mothers who participated in our research were 25 to 63 years old with an average age of 43.62 years, fathers were 31-72 years old with an average age of 46.31 years.

Table 4 Highest reached education (respondents anwered also question about the education of their partners)

	mothers	%	fathers	%
Primary school	0	0	3	5,0%
Secondary school	30	50,0	28	46,7
Vocational school	6	10.0	9	15,0
University	24	40,0	20	33,3

50% of mothers had secondary education. 40% of the mothers attended universities. 46,7 % of fathers had high school and 33,3% had university education .

Table 5 How many siblings does your child with Down syndrom have?

	N	%
No siblings	12	20,0
One sibling	21	35,0
Two siblings	19	31,7
Three siblings	5	8,3
Four siblings	3	5,0
∑	60	100

20 % of children had no siblings, 35% has one sibling. There were also families with more than 4 children, 13,3% together.

Table 6 In what order of your children was your child with Down syndrom born?

	N	%

Only one child	12	20,0
First	10	16,7
Second	17	28,3
They were twins	1	1,7
Third	11	18,3
Fourth	3	5,0
Fifth	1	1,7
Last in the order	5	8,3
Total	60	100,0

20% of children with Down syndrom were born as the only child, 16,7% as a first child, 28,3% as a second child. 18,3 % as a third child.

Table 7 Did you know during the pregnancy, that your child had Down syndrom?

	N	%
Yes	10	16,7
No	50	83,3
Total	60	100.00

Most of parents did not know during pregnancy that they expect the child with Down syndrome.

Table 8 Do both parents live together in one household ?

	N	%
Yes	50	83,3
No	10	16,7
Ttotal	60	100,0

As many as 83.3% of parents were able to survive as partners, only 16.7% of parents live separately.

Table 9 Do your relatives help you with your child?

	N	%
Yes	16	26,7
More likely yes	14	23,3
More likely no	25	41,7
No	5	8,3
Total	60	100,0

Up to 50% of parents do not recieve help for the child from their relatives.

Table 10 How do you perceive your child with Down syndrom?

	N	%
gift	45	75,0
suffering	1	1,7
other	14	23,3
total	60	100,0

Among the other answers parents mentioned : My child is a natural part of our family. We love our child from our heart, but we are getting old and sick, i tis not easy. My child is for us the same loviing child as our other children. We love our child and we fight together with our destiny. My child is sometimes a gift and other time a suffering, depends on every day challenge. 99% of parents consider their Down Syndrome child a gift or otherwise express affectionate relationship with their child, only 1% of parents admit that they sometimes have trouble with the child.

Table 11 How your other children accepted your child with Down syndrom?

	N	%
They help him/her with a joy also in public places	10	16,7
They take him/her as normal as they accept other siblings	38	63,32
They feel some shame for him/her	2	3,3
Other answer	17	28,3
Total	60	100,0

Among other answers we can find: His sister was shamed for him, bus as she grew up,it has changed. They cooperate as normal siblings. They are very sensitive to her/him. According to parents' testimony, as many as 63% of siblings regard a child with Down syndrome as a normal family member. 28% of siblings have a positive attitude towards them, which they expressed as a collaborative or sensitive approach.

Table 12 Does your child attend regular school or a special school for the children with special needs?

	N	%
My child attends regular school	18	30,0
My child attends a special school for the children with special needs	22	36,7
My child started to attend a regular school, but later was moved to special school	4	6,7
My child has an individual education	10	16,7
Other answer	6	10
Total	60	100,0

Among other answers we can read: My child attends that is a part of special school. (practical school is a type of education that, after finishing elementary school, prepares children with special needs to learn skills that allow them to work and support themselves in certain types of occupations). My child has finished a special primary school and continued three years in a practical school, where children get the ability for special kind of work. My child was integrated in a regular prime school, but then her health status got worse and she had to continue in a practical school. More children after they finished regular prime school in practical school. Only 30% of respondents said that their Down Syndrome child attended a normal mainstream school and 16.7% had individual education.

Table 13 Do you use alternative forms of education?

	N	%
Montessori school	17	28,3
Waldorf school	1	1,7
Other forms	7	11,7
None	35	58,3
Total	60	100,0

Among other answers we can find:We use program Montessori and program called „Yes we can“. Mathematics according Netty. Step by step program. All the possibilities of alternative education that parents are able to practice. 42% of children also use some elements of alternative education such as Montessori or Waldorf School.

Table 14 Did you postpone the year when you began sending your child to school?

	N	%
Yes	43	71,7
No	17	28,3
Total	60	100,0

Almost 72% of children have posponed the beginning of school attendance.

Table 15 Did elementary school teachers convince you that special school education would be more beneficial for your child?

	Number	%
Yes	38	63,4
No	22	36,6
Total	60	100,0

63% of parents were persuaded by educational staff that it would be even better to put the child in a special school. (Special school in Slovakia is the elementary school that educates only children with special needs. Other children do not attend such a school. Children with special needs are segregated in such a school, they do not have the opportunity to contact other healthy children.)

Table 16 Have you cooperated with the counseling center to integrate your child?

	N	%
Yes	42	70,0
No	18	30,0
Total	60	100,0

70% of parents use counseling services for their child

Table 17 What problems have you encountered in integrating your child with Down's syndrome? (Respondents could choose more than 1 answer)

	N	%
Poor expertise of teaching staff	20	33,3
Absence of teacher assistant	12	20,0
The school administrator‘s unwillingness to integrate your child into the school	24	40.0
We had no problems	5	8,3
Other	18	30,0

Among other answers we can find: Pending legislation. Unwillingness to cooperate on integration.Frequent turnover of assistants. I think our child is not suitable for integration. We did not try to integrate our child. The child was integrated in kindergarten without any problems. We had no possibility of

integration. We live in Vienna and there is high-level integration in the schools. The biggest problem for the integration of the child was the reluctance of the teaching staff, the lack of expertise of the teaching staff and the absence of assistants. Only 8% of parents did not encounter obstacles to integrating their child into the mainstream school.

Table 18 Is there a teacher assistant present when teaching your child?

	N	%
Yes throughout the all lessons	23	38,3
Only on some subjects	19	31,7
The school does not have a teacher assistant	18	30.0
Total	60	100,0

Only 38 % of children can use help of assistent throughout the all lessons. 30% of parents said that the school where their child goes has no assistant at all.

Table 19 In your experience, what are the positive aspects of the integration of children with Down syndrome?(Parents could choose more answers)

	N	%
Better social inclusion of the child	46	76,7
Decline of prejudice	29	48,3
Developing the independence of the child	38	63,3
A child with Down syndrome can be an enrichment to the lives of other children	31	51,7
Our child teaches other healthy children to accept the difference	32	53,3
Other	3	5,0

The greatest benefits of integration are seen by parents in better social inclusion of the child, developing child independence, eliminating prejudices and judgments, and that they teach healthy children to accept children with special needs.

Table 20 How is your child integrated in mainstream primary school?

	N	%
The child is integrated into the classroom during all lessons	15	25,0
The child is partially integrated. Only in some lessons, the other hours are spent out of class with an assistant	13	21,7
The child is only with an assistant at each class outside the classroom	3	5,0
The child is only educated in a special class with children with special needs	16	26,7
The child does not attend regular primary school	13	21,7
	60	100,0

Only 25% of children are fully integrated in classes with other children. Another 22% are integrated only during some subjects and spend other hours separately with an assistant. In fact, up to 27% of children are taught in separate classes.

Table 21 Does your child have an individual educational plan?

	N	%
Yes	32	53,3
No	22	36,7
I do not know	6	10,0
Total	60	100,0

53% of children use an individual educational plan.

Table 21 Do you think that education in a regular primary school is more difficult for your child than in a special school?

	N	%
Yes	15	25,0
More likely yes	11	18,3
More likely no	8	13,3
No	11	18,3
I do not know	15	25,01
Total	60	100,0

Almost 43% of parents think it is harder for their child to be educated in a mainstream school than they would be in a special school.

Table 22 According to your oppinion what are the disadvantages of integration? (Parents could choose more answers).

	N	%
High number of pupils in the class	29	48,0
Insufficient material equipment of class	18	30,0
None	5	8,3
Other	23	38,3

Among other answers we can find: It depends on what experts you find. If they are wise, they do not put obstacles to integration. Sometimes the child is "integrated" only for the form. But does not receive enough attention to its development and education.The unwillingness of teachers is the disadvantage in ordinary school. There are no shortcomings in community education. Insufficient education of teachers for the child with special needs. 48% of parents think that the major disadvantage of integration is the high number of pupils in the classroom. Another 30% see deficiencies in the classroom equipment. Among oter answers we can read:

Tab 23 Are suitable conditions for integration created in the school your child attends?

	N	%
Yes	6	10,0
More likely yes	14	23,3
More likely no	13	21,7
No	13	21,7

Our child does not attend regular primary school	14	23,3
Total	60	100,0

33% of parents believe that schools have suitable conditions for the integration of their children, 43% of parents say that the school does not have the conditions for integration.

Tab 24 If, on the basis of your experience so far, you had a choice again, would you choose to integrate into your mainstream school again?

	N	%
Yes	31	51,7
No	19	31,7
Other	10	16,7
Total	60	100,0

Among other there were answers as: We tried integration for one year and later moved to a special school. We tried integration, but it was difficult. The child started stuttering. We moved him to a special school. If our child had no vision problems, we would put him in regular school. In ordinary primary school, they refused to integrate our child. 52% of parents would decide to integrate their child again based on experience so far, 32% of parents would choose against integration.

Tab 25 were you gradually able to accept that your child has Down Syndrome?

	N	%
Yes	45	75,0
More likely yes	12	20,0
More likely no	3	5,0
No	0	0,0
Total	60	100,0

Up to 95% of parents have gradually learned to accept that their child has Down syndrome.

DISCUSSION

Through this research we wanted to find out what is the experiences of parents of children with Down syndrome with integration. Our initial effort to distribute the questionnaire on integration to all parents in the database had failed because most of them have no experience with integration, although, according to law, all children with Down syndrome should be integrated. That is why we involved parents from the Down Syndrome Association in Slovakia, whom we know personally and for whom we could supplement the questionnaire with interviews. 54 women and 6 men participated in the research. All of the parents who responded have children with Down syndrome. The children of these respondents were between 6 and 15 years old, ie in the age they were attending elementary school. The parents of children had mostly completed secondary education. A relatively high number had completed university, which roughly corresponds to the general population of Slovak citizens. Only 20% of children with Down syndrome are growing up as an only child, 80% of children had from 1 to 4 siblings. Up to 83% of parents lived together with their partners and children. Of all children, only 30% attended the mainstream school, up to 36% were enrolled straight into the special school without attempt ing integration, and nearly 7% of the other children were later transferred to the special school after the integration attempt. Almost 17% of children have individual education. Of the 30% of children attending mainstream school, not all are automatically integrated. In many cases, there is only pro-form integration; the child is often part of a segregated class in the mainstream school where children with special needs are concentrated without contact with other children. The most common problem faced by parents is the reluctance of educational staff to integrate a child with Down Syndrome into the classroom at all. Parents are often discouraged to ask for a child to be included in a

special school, and teachers are reluctant to integrate in a normal school **(Fulcher, 1989).** Often, educators do not know how to approach a child with Down syndrome **(Hegarty, 1993).** . There are a large number of pupils in the classroom and teachers are unable to address children with special needs during their classes. Although the law guarantees that a child with special needs is entitled to a teacher assistant who assists in his or her integration, the reality is often quite different. The school must apply for an assistant and only a small proportion of these requirements are met. It often happens that school gets an assistant one year and loses one year later due to lack of state funding. The teaching process itself is little controlled, sometimes it happens that the child is alone with the assistant in a separate classroom and the assistant does not deal with the child as she/he should, assistant only gives the child the task of drawing independently and does not work on personal development. The child is not interested in such teaching (Casey, W., Jones, D., Kugler, B and Watkins, B. (1988).. His/her dissatisfaction grows into unwanted manifestations of aggression. The consequence is that after some time the child is marked as unable to integrate and transferred to a special school. If parents have enough perseverance and have the opportunity to transfer such a child for example to the Montessori school, where they individually pursue it in an alternative way, the child begins to cooperate well and can develop remarkably (Mortimer, Sammons, Stoll, Lewis and Ecob, 1988). . It turned out that he or she was suitable for integration (Webster and McConnell, 1987 and Hegarty, 1993). Instead the attitude of teaching staff was unsuitable. When access to the child is improved in an alternative form of education, the child is able to make great progress (Ainscow and Muncey, 1988).

Most parents in our sample were able to cope with the fact that their child had Down's syndrome and learned to live with it. The siblings of these children are equally capable of taking their sibling with Down's syndrome as a normal part of the family, helping them, protecting them and having a nice relationship with them Parents have often stated that in those schools where teachers have enough knowledge about children with special needs and willingness to integrate, plus the possibility to get an assistant, the experiences of children and parents are positive. Children with Down Syndrome are able to socialize well, make progress and develop better than when in special school (Lorenz, 1985). They also benefit their classmates, children learn to accept "other" children who have a different appearance and special needs (Sugden, 1989). Many parents are often convinced by educators that it is better to place a child in a special school and do not realize that under favorable circumstances integration can help the child to develop better than a special school (Bird and Buckley, 1994). .

CONCLUSION

The integration of children with Down syndrome has been legalized in Slovakia for 15 years. In fact, perhaps only 10% of all such children are really integrated. Most schools still adhere to the old idea that such children are a burden for mainstream education and a special school is better for them. Teachers are not adequately trained and could not work with children with special needs. Often, there are high number of children in the classroom and the teacher has no room to address children with special needs. Although by law such children are entitled to assistant teachers, in practice assistants are unavailable due to lack of funding from the state. Where integration is successful despite all difficulties, children with special needs achieve good results. They are schools with good managers and enlightened educators who have been working on integration for a long time, are constantly educated on this issue, participate in internships abroad and then spread the acquired knowledge among other educators (Mittler, 1992). . There is also a need for parents' determination not to be discouraged by obstacles and to insist on the rights of children with special needs (Petley, 1994).

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STUDENT PERCEPTIONS AND ATTITUDES REGARDING MENTAL HEALTH

Abraham D. Traore, University of Evansville
Carrie Mehringer, University of Evansville
Anila Vadakkekalam Abraham, University of Evansville
Payal Patel-Dovlatabadi, University of Evansville

ABSTRACT

This paper explores the mental health status of undergraduate students at the University of Evansville, (UE). Current literature suggests that college students struggle with mental health issues such as depression, anxiety, and eating disorders. Specifically, this study looks at student struggles with stress and depression, with respect to gender differences between males and females. The likelihood to seek care and views of on-campus services is also evaluated. Overall, depression was common among all participants. The study also demonstrates a need for mental health services on campus with rampant disregard for the services currently offered.

INTRODUCTION

Mental health refers to the condition of human beings in relation to their emotional, social, and psychological well-being. The World Health Organization (WHO) defines mental health as the state of mind that affects the human ability to relate to other people. Additionally, mental health affects people's ability to handle psychological pressures and their ability to make life choices. Mental health problems have become prevalent in modern society, especially among young people. College students, as we know, have particularly been major subjects of mental health issues. According Hefner & Eisenberg (2009), at least 25 percent of college and university students struggle with mental health problems. Worse of these data is that more than half of such students do not seek professional solutions for their mental health problems. Students struggle with the challenge to balance normal human life, social events, and schoolwork as well as deliver in part-time jobs to make ends meet.

Mental health problems can pose adverse impacts on college students. According to Pedrelli et al. (2015), mental health problems can potentially decrease the physical health of students. Apart from that, mental health problems have been proven to be responsible for students' poor grades, poor college experience, and general poor life quality in college. Moreover, mental illness is a leading cause of suicides among college students in modern times (Bolton, Gunnell & Turecki 2015). According to the Suicide Prevention Resource Center, a survey conducted in 2015 by the American College Health Association showed that 30% of college students dealt with stress during the 2015-2016 academic year. Further, during the same year, 22% of the students experienced diverse type of anxiety, 20 % had sleep difficulties, and 14% suffered from depression. The need to treat mental illness among college students is imminent because students risk suffering from similar problems even after graduation.

Efforts have been made by higher education in improving students' mental health. These include offering mental health services and effectively intervening whenever students suffer from such problems. Nevertheless, little improvements have been made on the same. Among other reasons, low mental health literacy is a significant contributor to the lack of improvements in solving mental health problems. The knowledge that is at students' disposal in mental health is critical in improving their struggle with balancing life expectations and eluding mental health problems. Moreover, mental health literacy is also vital in leading students to come forward and know when there is a need for seeking solutions. Notably, the perception among male and female students on mental health is different. Published in 2019, a study conducted by the staff of Mayo Clinic Hospital has proven that females are in general more vulnerable to stress, anxiety, depression, and eating issues compared to males.

Therefore, this study seeks to find out the level of students' knowledge on matters relating to mental health. Apart from that, this paper seeks to examine the perceived status of mental health among college students. On the same note, this study looks at the factors and circumstances that bar college students from accessing mental health services. To achieve this, the study will identify various mental health problems that college students experience. Subsequently, this paper shall conduct a gender comparison on the various mental health disorders to determine how these problems are handled by females versus males. The study will analyze the students' knowledge of mental health services at the University of Evansville. This will enable an understanding of the perceived attitude on mental health and its subsequent contribution to mental health development and treatment.

As we have mentioned earlier, college students have become one of the most vulnerable groups to mental health problems. Therefore, conducting a study specifically on the perceptions of students is important. Understanding the perceptions and attitudes held by both the students affected by mental health issues as well as those not affected offer absolute ground to giving an informed inference on the mental health discussion.

Literature review

Mental health encompasses a long list of conditions with varying levels of severity and treatment. Some mental health conditions are common, while others are new and under research. The most common mental health conditions include anxiety disorders, mood disorders, eating disorders, and personality disorders, among others. Students in higher education tend to suffer from conditions in each category, from depression to eating disorders. As briefly discussed in the introduction, mental health issues are more prevalent in youth and college students compared to other populations. Specifically, mood disorders alongside mental problems arising from substance abuse are the most common among college students (Sunderland & Findlay 2013). Additionally, anxiety disorder sometime occurs in the early ages of adulthood, including students in their first year of college. Moreover, schizophrenia, a unique type of mental disorder that makes individuals give an abnormal interpretation of realities, also occurs in college students.

Prevalence and Incidence of Mental Health Issues

It is essential to analyze the background of mental health problems among college students. Subsequently, there is a great need to seek the reasons behind the high prevalence of mental health issues among college students. According to the stress-diathesis model, an individual's social health status plays a role in the primary basis of mental illness. These are the inborn conditions in human beings and which do not leave an individual. Social determinants of health exert powerful effects on an individual's health and are also the reason behind health differences among different human beings. According to the WHO 2013-2020 Mental Health Action Plan, various factors support and contribute to mental health in humans. These factors include, but are not limited to, the social, physical, and economic environments that people live. The college environment and high expectation from parents and friends is a potential reason behind inevitable stress and mental pressures.

Colleges as a Risk Factor to Mental Health Issues

There have been significant changes in college and university environments in recent years. Previous generations regarded the college environment as a den of hope for the future. However, college campuses no longer possess the same appeal. Kosyluk et al. (2016) opines that college environments today serve as dens of emotional turmoil and mental discomposure for students. The piling psychological pressure among students leads, in part, to the extreme diversity in colleges. Students stumble into a new environment and must adjust to a new array of people, cultures, pressures, and stressors. Apart from that, the populations on campuses today have massively increased because of a more general population increase and the increase in people's interest in a college education. These rapid changes create strenuous competition for academic and work success. Some experts believe that college environments are not only responsible for the increase in mental illness among college students, but also the severity of mental health problems among college students.

The theory of social stress suggests that people become more vulnerable to mental health problems when they undergo major events in life. For example, entering and completing college qualifies as a "major life event." Increases in anxiety and depression, among other mental issues occur as a result of these major life events (Ramachandiran & Dhanapa 2018). From this information, it is evident that college students are more exposed to mental health issues. College students have to put up with undesirable levels of mental pressure during their years of study.

College offers students with mental problems resources at a point of extreme vulnerability in their lives. As we have discussed earlier in this paper, college includes multiple aspects of life, including social health, education, and an impending career. Most colleges have numerous sources of helpful resources for mental health issues for students. Nevertheless, these resources only come to the glare of most students when they have reached severe levels. A study by Ketchen et al. (2015) found out that most college students are either unaware of the available resources within their midst or do not trust them to offer them with ideal solutions. Other studies on the same issue also indicate negative responses to students' access to resources such as counseling facilities during their time in college. The reasons behind the adverse reactions include a lack of information and a lack of interest. Failure of students with mental illness to seek help in a timely manner makes college students vulnerable to severe adverse effects. Moreover, they also expose themselves to frequent relapse of these mental issues in their future either while in college or upon completion of their education.

Gender differences

Wong (2016) asserts that being a female increases the chance of students having a higher literacy for mental health. According to multiple studies on this topic, female students are more informed of mental health than their male counterparts. Additionally, Reavley et al. (2012) report specifically that female college students tend to hold more information on mental health issues. Such knowledge includes identification of mental health issues within them and their friends to the available solutions, among other information. Despite the exposure that colleges give students with regards to acquiring general knowledge, gender differences genuinely exist when it comes to knowledge on mental health. Young adults below 30 years of age mostly have a great ability to identify mental health issues, such as depression. Nevertheless, male students are an exception. Most of them do not know the symptoms of depression compared to their female counterparts

The prevalence of mental health issues varies according to age, gender, and geographical location, among other factors. Several studies on mental health have offered unequivocal evidence of a significant difference in the occurrence of mental health issues in female and male college students. Firstly, mental health issues show different symptoms in male and female college students — for example, female students in college experience more depression cases than their male counterparts. Additionally, female students also suffer from eating disorders (Yen et al. 2009). The prevalence of depression in female students has been identified by some studies to be at over 5 percent, while the prevalence of depression among men stands at roughly 2.2 percent (Rotenstein et al. 2016). Contrary, conduct disorders occur more frequently among males compared to female students. Moreover, male students suffer from substance abuse disorders and social problems more often than their female counterparts. This particular difference proves a fundamental difference in mental health between male and female college students.

Despite these data which disfavor female students to suffer from more mental health issues than male students, more males' students end up committing suicide compared to females. As research from the Mental Health Foundation reveals that male students commit suicide at a higher rate than female students. While the current literature attempts to explain the discrepancies between males and females, inadequate evidence exists to prove any theory. While some researchers cite the difference in mental health literacy as the reason behind suicide differences, others cite the traditional perceptions of masculine and feminine. However, the current research does not prove these theories as facts.

Nevertheless, enough research is yet to be conducted to explain the disparities between females and males. There is a need to review more mental health data. This study will, therefore, provide further data to the perceptions and attitudes of students regarding mental health

METHODOLOGY

Participants

The study targeted 1992 full time undergraduate students of the University of Evansville (UE) who are of age 18 or older. After obtaining the Institutional Review Board approval, the participants were recruited utilizing mass emails sent to the students through a webpage link posted on the UE portal once a week for three weeks.

Procedure

A cross-sectional survey approach and exploratory research design was utilized to validate the hypothesis. The survey was created using an online survey platform made at our disposition by the university's Office of Technology Services. It was formatted in a Likert Scale style. The participants were asked to continue to the survey after completion of the consent form and after acknowledging they are over 18 years of age, undergraduate and had a full-time status. 15 questions were meticulously written for the survey. Each of them was written with the purpose of asking different questions related to the types of mental disorders students are experiencing while also asking for their knowledge and perception about the current mental health services available on campus. Some of these questions were simple "yes or no" or "prefer not to answer", whereas others were asked on scales "very poor"- "very good", "strongly disagree" - "strongly agree", "not at all likely" - "highly likely". Two of the questions were open-ended and were incorporated to obtain qualitative data about students' personal mental health concerns and opinion on how to improve the university's mental health services. These questions were used to find themes among the student population regarding mental health and mental health services.

Data analysis included analyzing the likelihood of seeking mental health care with respect to gender differences using a descriptive analysis. Additional analysis included assessing students' knowledge on the current mental health programs available on campus. The hypothesis predicted that females are more likely to seek care than their male counterparts are. The data were cleaned and codified using the different tables below.

Table 1: Background & Demographic variables

Variable	Level of measurement	Coding/description
Gender	Categorical	1= Male 2= Female 3= Prefer not to state
Race/ethnicity	Categorical	1 = White/Caucasian 2= African American 3= American Indian 4 = Hispanic or Latino 5= Other
Year of the study	Ordinal	1= Freshman 2= Sophomore 3= Junior 4= Senior
Disability status	Categorical	1= Yes 2 = No
Student athlete status	Categorical	1= Yes 2= No
History of mental disorder in the family	Categorical	1= Yes 2= No 3= Prefer not to answer

Early diagnosis of mental disorder	Categorical	1= Yes 2= No 3= Prefer not to answer
Concern(s) about mental health during the school year	Categorical	1= Yes 2= No
History of being bullied on or outside campus	Categorical	1= yes 2 = No 3= Prefer not to answer
Current mental health status	Ordinal	1= Very Good 2= Good 3= Average 4= Poor 5= Very Poor

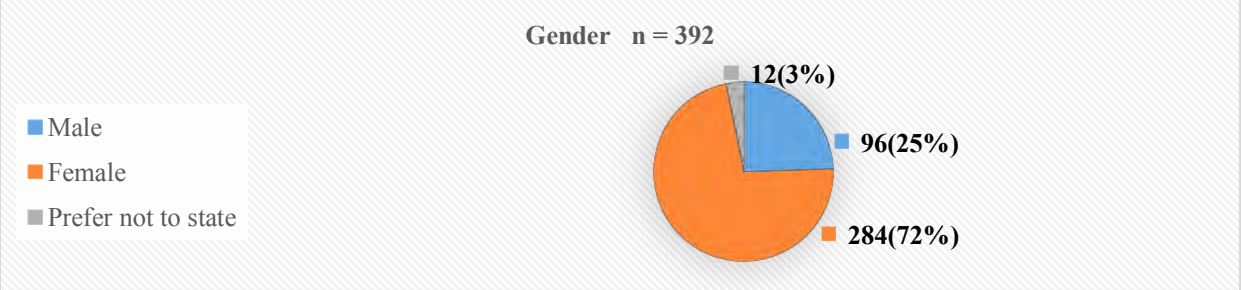
Table 2: Student's Perceptions and Attitudes Regarding Mental Health

Variable	Level of measurement	Coding/description
Frequent rely on drugs and/or alcohol to escape stresses	Ordinal	1= Strongly agree 2= Agree 3= Neutral 4= Disagree 5=strongly disagree
Know someone/ yourself struggling with anxiety, stress or inability to sleep after entering the school year in UE	Ordinal	1= Strongly agree 2= Agree 3= Neutral 4= Disagree 5= Strongly disagree
Knowledgeable about mental health-related issues	Ordinal	1= Strongly agree 2= Agree 3= Neutral 4= Disagree 5=strongly disagree
Can cope effectively to unexpected stresses	Ordinal	1= Strongly agree 2= Agree 3= Neutral 4= Disagree 5=strongly disagree
Aware of university's mental health services and know how to seek care	Ordinal	1= Strongly agree 2= Agree 3= Neutral 4= Disagree 5=strongly disagree
Student's perception of the effectiveness of the university's mental health services	Ordinal	1= Very poor 2= Poor 3= Average 4= Good 5= Very Good 6= Never utilized their services
Likeliness to seek support from campus services	Ordinal	1= Not at all 2= Unlikely 3= Neutral 4= Likely 5= Highly Likely

RESULTS

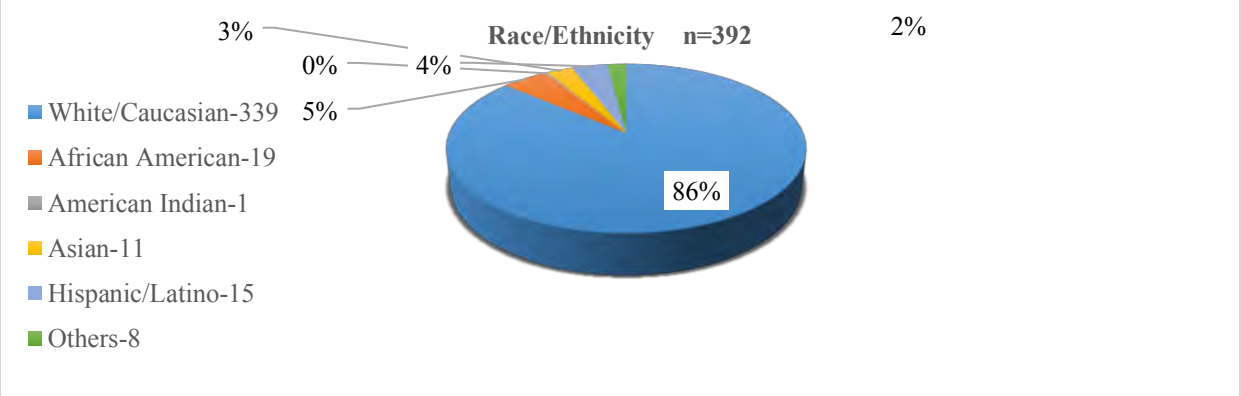
A descriptive analysis was used to assess responses to the survey. It is important to note that there were some missing data. Indeed, as displayed in the different figures below, the number of respondents differed per question. However, the data provided in this analysis accounted for those missing data. Overall, the survey resulted in 392 respondents who were above 18 years of age out of a targeted population of 1992 full-time undergraduate students. Regarding demographics, gender was identified to be drastically skewed, with nearly 72% of participants being female and 25% male (*see figure 1*).

Figure 1



The mental health topic seems to have a disparity when it came to races (*see figure 2*). The majority of respondents were White/Caucasian representing 86% of all the participants. Those who indicated an African American background only made up 5% of the respondents. Similarly, Asians and Latinos accounted for 3% and 4% of respondents, respectively.

Figure 2



Regarding year of study (*see figure 3*), senior made up around 32% of responses with the other 68% split between sophomores, juniors, and seniors. Majority of respondents did not encounter serious bullying whether on or off campus (*see figure 4*). However, 27% of respondents indicated that they have been bullied at some points.

Figure 3

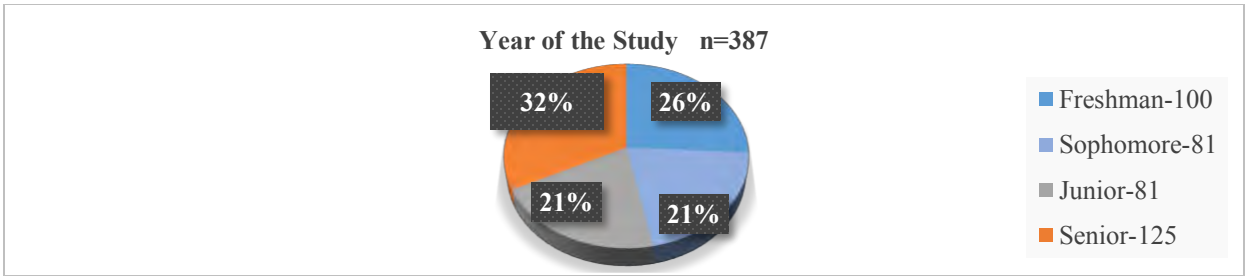
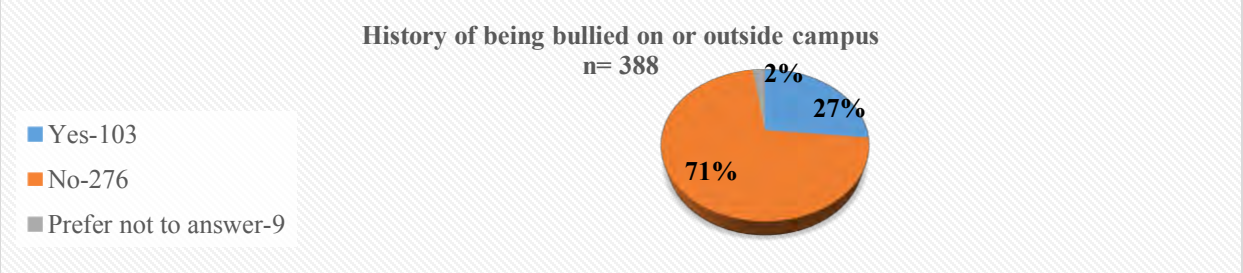


Figure 4



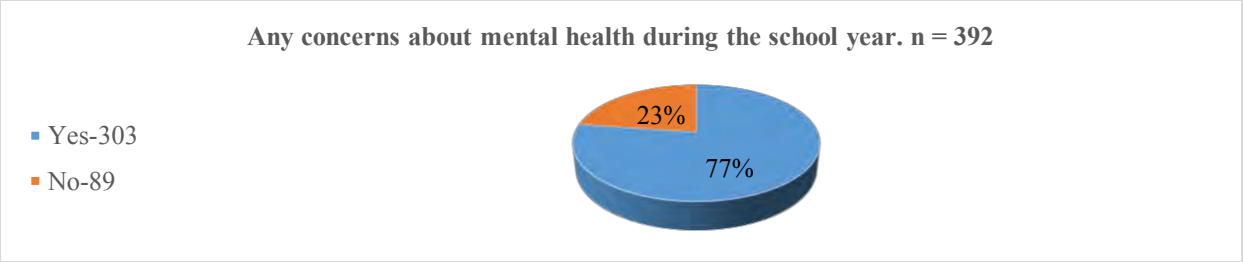
Below (*see table 3*), we can see that only 4% of the respondents admitted being disable, while 96% of them indicated not being disable. Among the respondents, 12% have indicated being student-athletes. In addition, 46% of the respondents agreed to have a history of mental disorders in their families, while 51% reported to have no such disorders in their families. Likewise, as shown below in the same figure, over half of the students (62%) responded that they have not been diagnosed with mental disorder

Table 3

	Frequency	Percentage (%)	Total Number of respondents (n)
Disability Status			
Yes	17	4	392
No	375	96	
Student Athlete Status			
Yes	45	12	388
No	343	88	
Family History of mental disorder			
Yes	180	46	
No	201	51	392
Prefer not to answer	11	3	
Previous diagnosis of mental disorder			
Yes	138	35	
No	242	62	390
Prefer not to answer	10	2	

The respondents were asked whether they have ever had concerns with mental health during the school year. They were also given the option to indicate what the concern was. The result to this question were alarming and will be discussed in-depth in the discussion portion of this paper. For now, in term of statistical number (*see figure 5)*, 77% of the respondents have indeed indicated that they have or had mental concerns during the school.

Figure 5



When the mental status question was fronted to the respondents (*see table 4*), only 8.72% confidently indicated they have a very good mental health. Over 60% of students rated their mental health as either good or average, with 31.28% and 32.05% respectively. On the other end, 24.1% indicated they had a poor mental health and 3.85% admitted to very poor mental status.

Table 4

Your Mental Health Status	Frequency (n=390)	Percentage (100 %)
Very Good	34	8.72
Good	122	31.28
Average	125	32.05
Poor	94	24.1
Very Poor	15	3.85

The data in table 5 below shows that more than half of the respondents either disagreed or strongly disagreed with the notion that they depend on drugs to relieve stress. Most of the respondents, 83.38% in total, seemed to have dealt with stress or know someone struggling with stress. Overall, most respondents had some knowledge on mental health with 54.08% and 23.72% agree and strongly agree respectively. Furthermore, the number of students who can cope with mental issues was also better; however, a total of 20.46% indicated to have some issues coping with unexpected stress. Roughly, 70% of the respondents either agreed or strongly agreed that they are aware of the university mental health services and know how to seek care.

Table 5

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Response Total
Frequent rely on drugs and/or alcohol to escape stresses	1.02% (4)	10.97% (43)	11.73% (46)	25.77% (101)	50.51% (198)	392
Know someone/ yourself struggling with anxiety, stress or inability to sleep after entering the school year in UE	51.92% (203)	31.46% (123)	8.44% (33)	5.37% (21)	2.81% (11)	391
Feel knowledgeable about mental health-related issues	23.72% (93)	54.08% (212)	17.35% (68)	4.34% (17)	0.51% (2)	392

Can cope effectively to unexpected stresses	11.51% (45)	37.85% (148)	30.18% (118)	16.37% (64)	4.09% (16)	391
Aware of UE's mental health services and know how to seek care	28.94% (112)	41.09% (159)	16.8% (65)	10.08% (39)	3.1% (12)	387

Finally (*see table 6*), when asked about the likeliness to seek support from the university's mental health services, 27% of the respondents stated that they were unlikely to seek assistance from the university, while 42% were either likely or highly likely to do the same. Furthermore, in term of gender comparison, the data gathered for the same question show that 37% of men were either likely or highly likely to seek care, while 44.7% of females were likely or highly likely to do the same. Even more pronounced was the fact that 12% of females were highly likely versus 5% of males.

Table 6

Likeliness to seek support from campus services	**Frequency (n=391)**	**Percentage (100%)**
Not at all	35	9
Unlikely	104	27
Neutral	87	22
Likely	126	32
Highly Likely	39	10

In the next sections, an in-depth analysis of certain findings will be performed. We will also explore some of the open-ended responses; and lastly, if possible, we will verify whether our hypothesis was correct and will try to give some recommendations.

DISCUSSION

While all students received the survey, the majority of participants were female. Men accounted for only 25% of the participant population, creating gender bias in the study results. The unequal participation between genders may be explained by the fact that females make up the majority of the student population at the University of Evansville. However, this could be used to support the alternative hypothesis, which states females are more likely to seek mental healthcare than males. The discrepancy in gender could be explained by the fact that females are more open to discussing mental health and mental health care. The study sample is also disproportionally White/Caucasian, with only 11% of participants identifying with other races. The lack of diversity among study participants affects the generalizability of study results. Further research must be conducted to determine whether or not the college experience is significantly different between races, as well as whether mental health services are viewed differently between races/cultures.

Information obtained in this study reveal a serious mental health problem among students at the University of Evansville. When provided the opportunity to state their health concerns, 151 students cited stress as a serious health concern and 132 admitted to struggling with depression/low mood. While students anticipate stress as a part of the college experience, they do not expect to struggle with low moods and depression. Alarmingly, some students admitted to considering self-harm and suicide as a result of their depression and stress. Based on the responses in the open-ended section, students struggle with more than a bad day or two. A portion of students struggle to get out of bed, while others struggle to fight their urge to self-harm as a result of depressive thoughts and moods.

Further, when questioned about the services on campus, students cited negative experiences, inaccessibility, and a lack of awareness as reasons for not utilizing on-campus mental health services. For example, students admitted to feeling unimportant and ignored when using the counseling services, going as far as to say they felt as though the department did not care about their struggles. Students also felt as though a lack of an online scheduling option and a full schedule make it difficult to make appointments for counseling sessions. Therefore, if the campus wishes to improve their counseling services, students recommend an online scheduling option and more counselors to meet the demand of the students. Furthermore, the campus must advertise the mental health services. Students cannot use the services if they do not know they exist.

CONCLUSION

Overall, the results of this study support the previous literature regarding mental health and student populations. Students struggle on a daily basis with mental health due to depression, anxiety, and stress to the point of suicidal thoughts and actions. When mental health services are available to students, female students are more likely to seek care than males, although both genders raise concerns about the accessibility and helpfulness of on-campus services. Regardless of their likelihood to seek care, both genders feel knowledgeable about mental health. Therefore, it is not a lack of knowledge that prevents students from seeking care, it is a distrust in the services, stigma against seeking care, and difficulty accessing available services. Universities can benefit from further research on how to improve the mental health of university students, as well as how to improve the mental health services available to students. The information presented in this study shows that students are hurting and are in desperate need of help. Whether or not the majority of students struggle with depression is irrelevant. Any number of students fighting for their life is unacceptable. Hopefully positive actions and results occur as a result of this study.

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SAFE INJECTION SITES ECONOMIC IMPACT

Steven Havrilla, University of Scranton
Katherine Loughlin, University of Scranton
Lea Scopelliti, University of Scranton
William Miller, University of Scranton

ABSTRACT

According to the CDC, nearly 494,000 people in the United States reported using heroin in 2017. Heroin is a semi-synthetic, highly addictive opioid that is made from morphine, a substance taken from opium poppy plants and can produce intense feelings of euphoria. In 2015, 81,326 emergency department visits occurred for unintentional, heroin-related poisonings in America. (Centers for Disease Control and Prevention [CDC], 2015) The cost of heroin use disorder was estimated to be $51.2 billion in 2015 US dollars ($50,799 per heroin user).

The high cost of heroin-related emergency department visits, Hepatitis C virus treatments, and incarcerations emphasizes the need for sustained investment in healthcare strategies that reduce the likelihood of abuse. (Jiang, 2017) Supervised injection sites (SIS), also called safer injection facilities or safer consumption services, are one such sustained investment. SIS are legally sanctioned facilities where people who use drugs can safely inject previously obtained drugs in the presence of medical staff. (Larson, 2017)

Studies have shown that SIS reduce infection, prevent overdose deaths, and increase treatment uptake, yet there are currently no sanctioned SIS in the United States. A recent study in Southern California found that each dollar spent on a SIS would generate US$2.33 in savings, for total annual net savings of US$3.5 million. (Irwin, 2016) Through meta-analysis of results from multiple studies, we hope to show that SIS would not only be a cost-effective intervention but also a significant improvement to public health.

BARRIERS TO POST-ACUTE CARE DENTAL SERVICES

Manwa Hegde, University of Scranton
Daniel J. West, University of Scranton

ABSTRACT

Oral Dental care is an essential service in post-acute care facilities such as, long term care, inpatient rehabilitation, home health agencies and skilled nursing facilities. Addressing oral hygiene of residents in such facilities becomes important for prevention of oral diseases and related systemic health conditions. The research suggests that improper dental care can result in serious health conditions like diabetes, cardiovascular diseases, chronic kidney diseases and cancer .The presenters review existing literature and examine the barriers faced by dental professionals and caregivers in providing dental services to post-acute care residents. Strategies and practices giving emphasis on staff education and implementation of policies and procedures that support oral care maintenance are discussed. Giving higher priority to dental care leads to better quality of care and increased patient satisfaction.

A PUBLIC HEALTH APPROACH: THE EFFECT OF POST-TRAMATIC STRESS DISSORDER ON ADOLECENTS

Blake Johnson, University of Evansville
Nicolette Wickes, University of Evansville
Janson Garman, University of Evansville
Shiva Rodrigues, University of Evansville
Mariam Alhajji, University of Evansville

ABSTRACT

PTSD (Post Traumatic Stress Disorder) is a condition of persistent mental and emotional stress occurring as a result of injury or severe psychological shock. Historically, PTSD has been more widely associated with military and other types of trauma; however, adolescents are also a major population that suffer from this disorder. Children as young as six years old can start to develop symptoms of PTSD. Adolescents can experience this specific disease differently and may express uncommon symptoms that may lead to worse cases or further psychological harm.

The goal is to explore the problem, causes and effects, treatment, and implementation for awareness of PTSD among teens. PTSD is a tricky disease as there is no set event or biological indicator that someone will be afflicted with this treacherous disorder, meaning that the trigger varies from patient to patient. Childhood PTSD can be worse than that of an adult. Children's minds are not fully matured until the age of twenty-five and the initiating trauma could cause cognitive developmental issues further into their life.

A public health approach to this ever-growing issue can be addressed in many different ways, through creating awareness of the situation, providing care for those in need, and by promoting safe households. Early action, with this type of impacting disease, is the best type of action. Post-Traumatic Stress Disorder can be managed and there is hope for those kids who suffer. If we work together as a concerned society, we can tackle this disorder. This is a Public Health problem, not an individual problem.

REDUCTION OF PHYSICAL AND CHEMICAL RESTRAINTS IN HEALTHCARE

Alexandra N. Latoria University of Evansville
William B. Stroube, University of Evansville

ABSTRACT

One of the significant changes in healthcare is the shift from fee-for-service to value-based care. There is a focus towards ensuring quality for patients. In order to ensure that quality, it is important to examine the impact physical and chemical restraints have on patients. This paper examines the effects of physical and chemical restraints and addresses alternative solutions to the use of restraints. A cumulative literature review of research has been conducted on physical and chemical restraints from 2000 to present. The use of alternative methods to restraints can have a largely positive impact on the patient's quality care.

HOW LEADERSHIP COLLABORATION CAN BEST ADDRESS THE HOMELESS CRISIS

Sarah Novak, University of Scranton
Hillary Grove, University of Scranton
Robert Spinelli, University of Scranton

ABSTRACT

This research focuses on the role of leadership collaboration to best address the current homeless crisis. Homelessness is permeating the streets of the United States and this population lacks the resources needed to maintain a healthy lifestyle. With little to no support, homeless individuals often end up using hospital-based care, specifically the Emergency Department, as a revolving door between shelters and the streets. The result of this healthcare use is the loss of time, resources, and money for the organization providing care. The impact of healthcare and governmental leadership collaboration will be analyzed to understand their role in reducing hospital-use among the homeless population. Techniques and strategies will be proposed for healthcare leaders to effectively improve homeless individuals' health and wellbeing, especially to create a shift from the use of the Emergency Department to program-specific care.

FOOD FARMACIES: A PRESCRIPTION FOR PROMOTING IMPROVED NUTRITION IN MICHIGAN

Michael F. Peters, Baker College

ABSTRACT

Food insecurity, the household-level economic and social condition of limited or uncertain access to adequate food, continues to grow in the United States. The USDA defines food insecurity as "the state of being without reliable access to a sufficient quantity of affordable, nutritious food." An average food insecure family of four may forgo up to one hundred meals a month. The Food FARMacy's mission is to increase access to healthy foods for patients who have insufficient, regular access to nutritious food and to provide specific community resources to assist these patients long-term. For example, according to a recent community health needs assessment, 82 percent of county residents report they do not consume an adequate amount of fruits and vegetables.

The Food FARMacy opened in August 2017 and has served 550 referred patients and 1,956 household members. Patients complete a short survey to determine their immediate nutritional needs. Doctors print off a referral for their patients to the Food FARMacy. The referral provides them with two days of healthy food for themselves and their household. It can be used twice a month for three months. The referral is given after patients answer "yes," or "sometimes," to two questions about experiencing food insecurity within the past 12 months. Nutritional guidance is provided, based on such factors as a history of diabetes, high blood pressure, obesity, etc.

They are also provided with information about obtaining long-term food suitability and other community resources. Patients have an active voice in the foods they choose. All of the food supplied at the Food FARMacy is purchased from the Food Bank of Eastern Michigan. A 5,200-pound shipment of USDA food is delivered once a month. We must introduce solutions to the problems of food insecurity. We are challenged with researching the possibility of ending hunger and malnutrition, by providing access to nutritious food and other community services.

This presentation will address the social impact of the food insecurity crisis and the growing need for solutions for a healthier lifestyle. Included in the presentation will be facts regarding the social and political impact of the crisis, why it has gotten worse in recent years, who benefits from the Food FARMacy, and alternative solutions to alleviate food insecurity for those in need.

AN EXAMINATION OF THE SUCCESS OF THE UNIVERSITY OF EVANSVILLE'S TOBACCO-FREE POLICY

Aisha Tijjani, University of Evansville
Phillip Smith, University of Evansville
MicKayla Schulte, University of Evansville
Sarah Joest, University of Evansville
Payal Patel-Dovlatabadi, University of Evansville

ABSTRACT

The purpose of this study is to assess the level of compliance of students to the University of Evansville's tobacco policy. A total of 250 respondents participated in the study and a survey of 19 questions was used to assess the process of implementation and the outcome of the university's tobacco policy. The results of the survey showed that most respondents are familiar with or understand UE's tobacco policy. However, most respondents report that violations of the policy are not met with adequate penalties. The university should consider co-implementing the tobacco policy with adequate penalties in order to increase compliance.

TRACK

HEALTHCARE QUALITY

REDUCING READMISSIONS FOR SURGICAL SITE INFECTIONS BY UTILIZING A VARIETY OF INTERVENTIONS

Dennis Emmett, Marshall University

ABSTRACT

This paper examines what hospitals can do to reduce readmissions for surgical site infections. Realizing that CMS does not pay the hospital for readmissions due to surgical site infections, strategies must be put into place to reduce the number of readmissions. The analysis will examine what has been done in the hospital, then ways to assess each patients risk for SSI upon leaving the hospital. Finally, providing some interventions for reducing SSIs. Introducing the concept of "visiting practitioner".

INTRODUCTION

In today's world, hospitals are being asked to take more responsibility for the care of the patient once they leave the hospital. In an overhaul of Medicare rules primarily intended to deter fraud and abuse, one of the major focuses is to improve follow-up care for patients after they leave the hospital. Increasingly, Medicare is holding hospitals accountable for the aftercare that patients have (Alonz-Zaldivar, 2019).

It is possible that one can save money by spending money. In a report released by the Bipartisan Policy Center, it was found that by providing non-medical benefits; such as, home delivered meals could save money. In an analysis performed by Ananya Health Innovation, it was found that for every dollar spent on home delivered meals, Medicare saved $1.57 per patient (Donnellan, 2019).

The purpose of this paper is to apply this concept to the area of surgical site infections (SSI) in order to achieve cost savings. Medicare has stopped paying hospitals for readmission for SSIs for numerous procedures, including orthopedic procedures (Kwong, 2017). If one can find ways to reduce readmission due to SSIs, the hospital can save money.

Data from Agency for Healthcare Research and Quality (AHRQ) states that more than 10 million patients undergo in-patient surgical procedures each year. This accounts for over one-fourth of all hospital stays (PSNet, 2019). A surgical site infection (SSI) is defined as infection related to an operative procedure that incurs at or near the surgical incision within 30 days of the procedure or 90 days if prosthetic material is implanted (CDC, 2010). It is the most common preventable complication. SSIs occur in 2 to 4% of all patients undergoing in-patient surgical procedures. If there are 10 million in-patient surgeries performed annually, a conservative estimate of the number of SSIs would be 3% of the 10 million or 300,000. SSIs are the leading cause of readmissions to the hospital following surgery. In addition, approximately 3% of patients who get an SSI will die (PSNet, 2019). Conservatively, the number of deaths would be 3% of the number of SSIs (300,000) or 9000 deaths. This is a significant problem in terms of human suffering; illness and death.

The monetary cost of SSI varies from case to case, due to the degree of infection and the site of the infection (Eloquest, 2018). Hospitals should be concerned with not only the human cost, but also the monetary cost. An estimated average cost of an SSI can be more than $25,000 to $90,000 for a prosthetic implant. SSIs cost the U.S. healthcare system between $3.5 and $10 billion annually (Eloquest, 2018). In addition, it has been found that

60% of SSIs are preventable (Eloquest, 2018). Since 2008, Centers for Medicare and Medicaid Services is no long reimbursing hospitals for readmissions due to SSIs (Eloquest, 2018).

Shepard et al. (2013) performed a study to identify the change in a hospital profit due to SSIs. The study was performed at Johns Hopkins Health System over a three year period. The cost for each SSI was between $4174 and $22,239. This is a significant monetary cost.

The formula used by the CMS fails to account for sociodemographic factors, depriving neediest hospitals of necessary resources (American Hospital Association, 2016). Further research showed that the hospitals that could least afford it were penalized the most.

This paper will explore what are some of the protocols put in place to reduce SSIs. Next, the paper will explore other possible solutions to reduce the number of SSIs. Hopefully, this will lead to savings for each healthcare center and the healthcare system as a whole.

Systems in place

There are numerous protocols that hospitals utilized to decrease the number of SSIs. The majority of SSIs are considered preventable. Accurate measurement of the number of SSIs is difficult, but can be done. The CDC's National Healthcare Safety Network has developed a system of accounting for SSIs over time and comparing various health facilities (PSNet, 2019). In addition, the CDC has put together guidelines summarizing the possible prevention protocols (PSNet, 2019). Implementing these programs in healthcare organizations has been problematic.

Some of the programs are the comprehensive-unit-based-program (CUSP). CUSP emphasizes improving the safety culture through continuous improvement. This is done by learning from past errors, improving teamwork, and making safety a goal for everyone in the organization (PSNet, 2019). Another tool is the surgical safety checklist. This include specific steps to reduce SSI risk. The checklist is to make sure that the proper steps are taken before, during, and after surgery (PSNet, 2019). This is similar to the checklists used by airplane crews before, during, and after each flight. In addition, the AHRQ Safety Program for Improving Surgical Care and Recovery is collaborative program to aid in the recovery of surgical patients (PSNet, 2019).

All of this suggests that a lot has been done to help reduce the incidence of SSIs while the patient is in the healthcare facility. All of these programs go into great detail on what needs to be done. This is an important part of a solution. The Joint Commission has included the use of safety programs to prevent SSI as one of its National Patient Safety Goals. The rate of SSIs are publicly disseminated by CMS (PSNet, 2019).

Discharge information

A large proportion of the SSIs occur post-discharge. This has created a problems for healthcare organizations. How to control the environment once the patient leaves the hospital. In addition, risk factors for SSIs include age, tobacco use, diabetes, and malnutrition (PSNet, 2019). These factors are outside the control once the patient leaves the healthcare facility. Many ambulatory surgical patients are discharged within hours of admission and may not have been given appropriate discharge education.

All facilities are concerned with discharge information. Most of the time this is done very quickly and may not be understood completely by the patient. Healthcare facilities have at their disposal numerous instruments to determine the patient's readiness for discharge. Two of these are Quality of Discharge Teaching Scale (QDTS) and Readiness for Hospital Discharge Scale (RHDS). Both of these assess the patient's understanding of what needs to

be done post-discharge (McCabe et al., 2018). Knier et al. (2015) did a study that found that 20% of all patients had adverse event and that 6% could have been prevented with better quality of discharge information.

Possible factors leading to surgical sight infection

Once a patient is discharged, the hospital loses control of the care of the patient. There are numerous things that might be required; such as, cleaning the surgical incision, changing bandages, applying topical medication, taking oral medication, etc. If these are not done or done properly, the probability of infection will increase. There are numerous factors that may influence the probability of incurring a surgical sight infection.

There are many factors. The following is a list of factors that may be important. The order does not reflect the relative importance.

1. Is there a caregiver? Does the patient have someone living with them that is able to perform the various activities? For example, the caregiver can change the bandage, make sure that the patient takes any medication. In the case of elderly patients, the caregiver may be a spouse. Is that spouse able to perform the duties?

2. Does the patient have any other medical conditions that may increase the probability of an SSI? Some of these conditions would be diabetes, alcohol or drug abuse, smoking, etc. One would want to assess this prior to the patient leaving the facility.

3. What are the living conditions? Is there clean water? Is the home relatively clean? If not, then these conditions will increase the probability of SSI.

4. What is the educational level of the individual? Some individuals are not able to understand why the procedures required are necessary. Thus, they may not perform them.

5. What is the economic condition of the patient? Can the individuals pay for the necessary bandages and medications? If not, then the person will not buy them. This increases the probability of SSI.

There are probably other factors that could be listed. What is needed is an assessment tool that will aid healthcare providers in determining the risk prior to discharge. If the risk is low, then nothing needs to be done. If the risk is high, then follow-up needs to occur. The two discharge scales mentioned above (QDTS and RHDS) may be a start. Further information is probably needed, if there is a surgical site.

Possible interventions

There are several possible interventions that might lessen the probability of having a surgical site infection. These strategies would be utilized in cases where the individual scored high on the assessment scale.

1. Telephone call – A simple telephone has been found to be effective in reducing readmission rates (Costantito et al., 2013). It also provided an opportunity to address other issues that weren't covered on discharge. One can ask whether the individual has filled prescriptions, scheduled a follow-up visit, etc. This has very low cost, but may not be able to obtain all information.

2. Pharmacists - Expanding the scope of pharmacists could help patients. Ni et al. (2017) showed that pharmacists can reduce the likelihood of high-risk patients being readmitted to the hospital. The question is who is going to pay for this service and will it require some additional training. In rural areas, is there a pharmacy nearby and can the patient get transportation to the pharmacist?

3. Mobile health (mHealth) – Smartphones have high quality cameras. With internet connectivity, one should be able to transmit pictures of the surgical site along with other vital information to clinicians to examine (Sanger et al, 2014). Smartphones are owned by a large number of individuals. This technology may work for certain individuals. Individuals with high risk may not have smartphones or internet connectivity. This would invalidate the use of this intervention.

Another intervention

There is one additional intervention that might be viable. Most healthcare centers serve a geographic region. This region may be relatively small in large cities to relatively large in rural locations. Hospitals could employ "visiting practitioners" probably on per diem basis to visit individuals that are at risk for surgical site infections. These individuals could be RNs, LPNs, medical assistants, or other healthcare provider. RNs and LPNs may be looking for a way to supplement their income. These individuals would already have the necessary training to examine the surgical site, apply medication, and change bandages. Medical assistants and others may need some additional training.

This intervention would be affordable because it would be per diem. Suppose a patient lives in Westburg. The hospital would have a list of available healthcare personnel in that area. A call would be made to one of the healthcare personnel and the patient's information would be given to them. They would then make the necessary arrangements to provide the services. Most services would not be needed long-term. The cost would be minimal. The cost would include the materials, car mileage, and wages.

As stated previously, the cost to the healthcare facility for readmission of a SSI is between $25,000 and $90,000. If one uses the lower end of the cost ($25,000), then preventing one readmission may pay for the cost of the program. One may want to determine the cost per patient of providing the intervention times the number of individuals that would need monitoring. This would go a long way to determining if the cost-benefit is worth it. It appears on the surface that the program would worthwhile.

CONCLUSION

Surgical site infections occur quite often. Healthcare facilities have done a good job of reducing these while the patient is in the hospital. When the patient leaves hospital, the care of this individual is outside the control of the healthcare facility. If a patient is readmitted to the hospital, Medicare and Medicaid do not pay for the cost. The cost is borne by the hospital. Therefore, the hospital should attempt to find ways to reduce the number of readmissions.

Presented here are some ways that hospitals can reduced readmissions due to SSIs. First, one has to provide good quality discharge information. Explaining to the patient what needs to be done, along with what happens if the procedures are not followed. Second, an assessment needs to make of the risk for SSI for each patient. The assessment needs to include living conditions, age, other medical problems, etc. This will identify possible candidates for follow-up. Third, an intervention strategy must be determined. There were several mentioned in this paper. Need to match-up the candidate to the appropriate strategy.

One strategy provided in this paper is that on "visiting practitioner". The hospital would send an individual to a patient's home to provide appropriate care. This could be done on a per diem basis reducing the cost. Again, if this prevents one readmission due to SSI, the program would probably more than pay for itself.

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DO GREATER BUDGETARY ALLOCATIONS TO PHARMACY AND MEDICAL LABORATORIES LEAD TO LOWER HOSPITAL-ACQUIRED INFECTIONS IN CRITICAL ACCESS HOSPITALS?

Kelly Haugen, North Dakota State University
Daniel Friesner, North Dakota State University
Matthew McPherson, Gonzaga University

ABSTRACT

Over the past 25 years, one of the most important and fundamental changes that have occurred in the U.S. health care system is the emphasis on quality assurance. All providers must regularly assess the quality of services provided to patients and demonstrate that the quality of care provided meets acceptable standards. Quality of service is usually set by regulatory agencies, accreditors, and/or third-party payers, and standardized through the establishment of quality indicators. Benchmarks for each indicator are also established, such that meeting or exceeding the benchmark demonstrates that the provider has met or exceeded the acceptable standard. Failure to meet these standards leads to a loss of revenue (i.e., lower reimbursement from insurers for services provided and/or other financial penalties), a loss of accreditation, or a host of other factors.

Most hospitals and health systems in the U.S. have established a variety of quality assurance programs to address these issues. Among the most common programs are those designed to minimize the occurrence of hospital acquired infections, particularly because the infection was acquired within the hospital or health system concurrent to the provision of other care (usually an invasive procedure such as a surgery). Thus, the hospital or health system bears the direct and primary responsibility for these infections (and any costs associated with patient care to resolve these infections), and also bears primary responsibility for minimizing future occurrences of such infections. Perhaps more importantly, implementing an antimicrobial stewardship programs require collaboration from multiple groups of clinicians, including (but not limited to) physicians (and other prescribers), nurses, pharmacists, and medical laboratory staff. The first two groups are important because they provide care during and immediately following the provision of care that facilitated the infection. It is important for these groups of clinicians to develop policies, protocols, and best practices to prevent hospital-acquired infections. Pharmacists and medical laboratory personnel, especially those trained in infectious disease and microbiology, are crucial in identifying and ameliorating an infection, once it occurs. These clinicians also play a role in assisting physicians, nurses, and other clinicians as they develop the aforementioned policies, procedures, and best practices to minimize future infections. But in both cases, the roles of pharmacists and medical laboratory personnel are to support and inform the efforts of other clinicians. This manuscript focuses specifically on the role of pharmacists and medical laboratory personnel in supporting these efforts.

Developing and implementing antimicrobial stewardship programs are particularly challenging for critical access hospitals, which have 25 or fewer beds and are located in medically underserved (and usually rural) areas. Due to their size and geographic constraints, these facilities have fewer financial resources at their disposal, experience difficulties recruiting and retaining staff, and cannot capture efficiency gains (such as economies of scale and scope) as well as larger, urban hospitals. Moreover, they usually do not hire staff – especially infectious disease pharmacists and medical laboratory microbiologists - with specific expertise in antimicrobial stewardship programs, but rather assign these programs to currently employed "generalist" clinicians, who must balance the demands of the program with their other job responsibilities. Perhaps more challenging is the fact that the microbiology laboratories in critical access hospitals may not be equipped with the necessary technology to monitor and test for the presence of specific pathogens. Thus, implementing an antimicrobial stewardship program may also require a considerable capital investment.

For critical access hospital administrators, the result is a financial conundrum. Should the hospital use its limited resources to augment the budgets of the pharmacy and medical laboratories to support antimicrobial stewardship initiatives, given alternative uses of its limited resources? To address this question, administrators must first determine whether a statistical link exists between the resources allocated to the pharmacy and medical laboratory departments and rates of hospital acquired infections. If additional budget allocations to these departments leads to substantially lower rates of infections, then investing the hospital's limited resources in these departments may be an efficient endeavor. Alternatively, if a small or insignificant relationship exists, the hospital is better served by making strategic investments in other units to reduce infection rates. To date, little evidence exists in the health services literature to quantify the magnitude of the relationship between resource allocations to these departments and overall infection control in the hospital.

This paper undertakes a retrospective, exploratory, empirical study (using multivariate regression analysis techniques) to quantify the impact of budgetary allocations to the pharmacy and medical laboratory departments on the rates of various hospital acquired infections, specifically Clostridioides difficile (or C-diff) and surgical site infections. Data are collected from critical access hospitals in Washington State from 2016 and 2017, the most recent data available at the time the study was conducted. The data are unique in that these hospitals are required to report a complete set of infection rates for each hospital in the state, as well as a complete set of hospital financial information, inclusive of departmental budgets. Thus, a full set of information is available to facilitate a thorough empirical analysis.

IS IT FINANCIALLY VIABLE TO MINIMIZE HOSPITAL-ACQUIRED INFECTIONS? EMPIRICAL EVIDENCE FROM RURAL HOSPITALS IN WASHINGTON STATE

Matthew McPherson, Gonzaga University
Kelly Haugen, North Dakota State University
Daniel Friesner, North Dakota State University

ABSTRACT

Most hospitals and health systems in the United States operate on thin financial margins. Changes in the financing of health care, most notably declining third party payer reimbursements and increasing quality assurance requirements to capture available reimbursements, have forced hospitals and health systems to increasingly seek ways to gain efficiencies and reduce operating costs. This is especially true for critical access hospitals, which are relatively small (i.e., have 25 or fewer beds) and located in rural or medically underserved areas. Compared to other hospitals and health systems, these facilities have fewer financial resources, cannot capitalize on economies of scale and scope, and experience difficulties in recruiting and retaining clinicians.

Quality assurance requirements – especially for specific requirements such as the implementation of antimicrobial stewardship programs – are particularly cumbersome for critical access hospitals. These facilities do not house clinical staff (especially physicians, pharmacists and medical laboratory personnel) with specific expertise in infectious diseases. Facilities may hire specialists to implement and manage these programs, which leads to increased labor expenses. More commonly, these initiatives are assigned to non-infectious disease personnel who must implement and manage the antimicrobial stewardship program in addition to their regular duties. These programs must also be supplemented with major capital investments. For example, monitoring the level of pathogens requires the addition of equipment within the medical laboratory to rapidly screen and identify the presence of certain types of infections, especially those that are resist to traditional antibiotics. This equipment often requires frequent maintenance, whose contracts are not insubstantial and are recurring expenses for the firm.

These requirements place critical access hospitals in a precarious position. They are required to report any hospital acquired infections, and reimbursement from third party payers is directly tied to the evidence provided by the hospital to show that it is minimizing the likelihood that hospital acquired infections occur. Failure to do so negatively impacts both the facility's profitability as well as certain dimensions of health care quality. Concomitantly, initiatives designed to minimize the likelihood of hospital acquired infections both reduces profitability (through increased variable - and possibly fixed - costs) and alters the capital structure of the firm (through the acquisition and possible financing of assets necessary to implement these programs). Each facility must strike a balance between each of these tradeoffs. Unfortunately, only a paucity of the health care finance literature has empirically investigated the nature of this tradeoff, especially among critical access hospitals.

The purpose of this paper is to conduct an exploratory study to empirically investigate the relationship between the rates of specific types of hospital acquired infections and the financial position of the firm. We focus specifically on the impact of two categories of hospital acquired infections – surgical site infections and Clostridioides difficile (or C-diff) infections. The financial viability of critical access hospitals is assessed holistically using a range of various financial accounting ratios to cover profitability, capital structure, asset turnover, and liquidity. The study is implemented using a panel of critical access hospitals in Washington State during the 2016 and 2017 calendar years.

TRACK

STUDENT PANEL

HEALTH ADMINISTRATION – STUDENTS' PERCEPTIONS, CONCERNS, EXPECTATIONS AND OUTCOMES

Crissy Flake, Northcentral University
Carlos Galindo, University of Houston – Clear Lake
Priyanka Tetali, University of Scranton
Solomon J. Yniguez, University of Houston – Clear Lake

ABSTRACT

The field of healthcare administration continues to demonstrate robust job growth. In response, schools and colleges are responding with new degree programs to meet the growing demand. Institutions of higher education are developing degree programs to distinguish themselves, attract students, and remain competitive. Program offerings vary from traditional models to remote learning. The degree foci vary from business degrees with a healthcare administration specialization to focused degrees in healthcare administration. While the collective student profile of those pursuing degrees in healthcare administration is diverse, there are common goals, perceptions, concerns, expectations, and desired outcomes expressed by students.

The primary objective of this presentation is to discuss student perceptions, concerns, expectations, and outcomes of graduate programs at the master and doctorate levels. The panelists will share their experiences with examples of superior program practices, which could serve as a model for other institutions. Other topics will include obstacles or barriers, and suggestions for program enhancements, which have the potential to advance healthcare administration education and improve the readiness of graduate students to join the field of healthcare administration professionals.

AUTHOR CONTACT INFORMATION

BUSINESS AND HEALTH ADMINISTRATION ASSOCIATION

MBAA INTERNATIONAL AUTHOR CONTACT INFORMATION

First Name	Last Name	Affiliation	E-Mail
Anila Vadakkekalam	Abraham	University of Evansville	aa550@evansville.edu
Ashraf	Affan	Angel Kids Pediatrics	aaffan@comcast.net
Luciano	Albanese	University of Evansville	la118@evansville.edu
Haleama	Al Sabbah	Zayed University	haleemah.alsabah@zu.ac.ae
Mariam	Alhajji	University of Evansville	ma331@evansville.edu
Mohammad Nabil	Almunawar	Universiti Brunnei Darussalam	nabil.almunawar@gmail.com
Anthony Paul	Andrews	Governors State University	AAndrews@govst.edu
Muhammad	Anshari	Universiti Brunnei Darussalam	anshari.ali@ubd.edu.bn
John Laurence	Arnfinsen	University of Oslo	laurence.arnfinsen@gmail.com
Elliot	Aronson	Emory Healthcare	Elliottaron30@att.net
Sydney	Bachman	University of Evansville	sb462@evansville.edu
Casey W.	Baker	Marshall University	bakerc@marshall.edu
Marcy	Binkley	Lipscomb University	mrbinkley@lipscomb.edu
Emma	Boebinger	University of Evansville	eb261@evansville.edu
Marcia	Butler	Clayton State University	marciabutler@clayton.edu
Ashish	Chandra	University of Houston – Clear Lake	chandra@uhcl.edu
Robert	Clegg	Northcentral University	RClegg@ncu.edu
Elicia	Collins	Clayton State University	eliciacollins@clayton.edu
Michael M.	Costello	University of Scranton	michael.costello@scranton.edu
Kathleen	Curtin	D'Youville College	curtink@dyc.edu
Jonathan	Daigle	Monmouth University	jdaigle@monmouth.edu
Elizabeth	Dennis	University of Scranton	elizabeth.dennis2@scranton.edu
Rita A.	DiLeo	University of Scranton	rita.dileo@scranton.edu
Michael	Duchaj	Northwestern University Advocate Medical Group	michael.duchaj@advocatehealth.com
Kelly	Duffy	Daytona State College	Kelly.Duffy@daytonastate.edu
Lisa	Eichelberger	Clayton State University	lisaeichelberger@clayton.edu
Dennis	Emmett	Marshall University	DEmmett@marshall.edu
Crissy	Flake	Northcentral University	C.Flake9680@o365.ncu.edu
Elmer B.	Fos	D'Youville College	fose@dyc.edu
Victoria	Foster	Clayton State University	Victoriafoster@clayton.edu
Dan	Friesner	North Dakota State University	Daniel.Friesner@ndsu.edu
Ronald	Fuqua	Clayton State University	RonaldFuqua@clayton.edu
Carlos	Galindo	University of Houston – Clear Lake	cegalindoc@gmail.com
Janson	Garman	University of Evansville	jg334@evansville.edu
Blair	Gifford	University of Colorado Denver	Blair.gifford@ucdenver.edu
Hannah	Gourley	University of Evansville	hg82@evansville.edu
Deborah	Gritzmacher	Clayton State University	DeborahGritzmacher@clayton.edu
Hillary	Grove	University of Scranton	Hillary.grove@scranton.edu
D. Rob	Haley	University of North Florida	rhaley@unf.edu
Hanadi	Hamadi	University of North Florida	h.hamadi@unf.edu
Fawzaan	Hashmi	Mankato West	fawzaanh@gmail.com
Kelly	Haugen	North Dakota State University	Kelly.Haugen@ndsu.edu
Steven	Havrilla	University of Scranton	steven.havrilla@scranton.edu
Manwa	Hegde	University of Scranton	manwa.hegde@scranton.edu
Joey	Helton	Clayton State University	JoeyHelton@clayton.edu
Cassandra	Henson	Townson University	chenson@townson.edu
Claudia	Höhenberger	Vienna University of Technology	claudia.hoehenberger@tuwien.ac.at
Angela	Hollis	Clayton State University	angelahollis@clayton.edu
Hengameh	Hosseini	University of Scranton	Hengameh.hosseini@scranton.edu
Bandar	Idris	University of Houston – Clear Lake	IdrisB0017@UHCL.edu

Su Jin	Jeong	University of Evansville	sj117@evansvville.edu
Sarah	Joest	University of Evansville	sj90@evansville.edu
Blake	Johnson	University of Evansville	bj109@evansville.edu
Adnan	Kisa	Kristiania University College	Adnan.Kisa@kristiania.no
Alexandra N.	Latoria	University of Evansville	
Rodeen	Lechleitner		rodeenlechleitner@gmail.com
Marissa	Lembo	University of Scranton	marissa.lembo@scranton.edu
Bart	Liddle	Lipscomb University	bart.liddle@lipscomb.edu
Katherine	Loughlin	University of Scranton	Katherine.loughlin@scranton.edu
Lucia	Ludvigh Cintulova	St. Elisabeth University of Health and Social Work	luciacin83@gmail.com
Crystal	Marchant	Clayton State University	crystalmarchant@clayton.edu
Matthew	McPherson	Gonzaga University	mcpherson@jepson.gonzaga.edu
Carrie	Mehringer	University of Evansville	cm314@evansville.edu
Michaelangelo	Messina	University of Scranton	michaelangelo.messina@scranton.edu
Linda	Miles	Daytona State College	Linda.Miles@daytonastate.edu
William F.	Miller	University of Scranton	william.miller2@scranton.edu
Monroe J.	Molesky	Alma College	molesky2mj@alma.edu
Cynthia	Naughton	North Dakota State University	Cynthia.Naughton@ndsu.edu
Jami	Nobbe	University of Evansville	jn159@evansville.edu
Sarah	Novak	University of Scranton	sarah.novak@scranton.edu
Comfort	Obi	Clayton State University	cobi2@student.clayton.edu
Robert	Palumbo	Northwestern University Advocate Medical Group	robert.palumbo@fsm.northwestern.edu
Sinyoung	Park	University of North Florida	sinyoung.park@unf.edu
Jai	Parkash	Keiser University	jaiparkash@hotmail.com
Rangarajan	Parthasarathy	University of Illinois at Urbana-Champaign	rparth2@illinois.edu
Payal	Patel-Dovlatabadi	University of Evansville	pp42@evansville.edu
Michael F.	Peters	Baker College	michael.peters@baker.edu
Jamie	Pierce	University of Scranton	Jamie.peirce@scranton.edu
Libusa	Radkova	St. Elisabeth University of Health and Social Work	libusa.radkova@gmail.com
Ateequr	Rahman	Rosilind Franklin University	ateequr.rahman@rosalindfranklin.edu
Bernardo	Ramirez	University of Central Florida	bernardo.ramirez@UCF.edu
Cherie Lynn	Ramirez	Simmons University	Cherie.ramirez@simmons.edu
Alexander	Redlein	Vienna University of Technology	alexander.redlein@tuwien.ac.at
Shiva	Rodrigues	University of Evansville	sr264@evansville.edu
Jane	Rosati	Daytona State College	JaneLillian.Rosati@daytonastate.edu
Heather	Ruggiero	Clayton State University	Heatherruggrieo@clayton.edu
Yelena	Sahakian	Rosilind Franklin University	yelena.sahakian@my.rfums.org
MicKayla	Schulte	University of Evansville	ms604@evansville.edu
Lea	Scopelliti	University of Scranton	lea.scopelliti@scranton.edu
Maitri	Shah	University of Scranton	maitri.shah@scranton.edu
Kanza	Shamim	University of Evansville	ks502@evansville.edu
Michaeline	Skiba	Monmouth University	mskiba@monmouth.edu
Lisa	Smiley	Clayton State University	lisasmiley@clayton.edu
Phillip	Smith	University of Evansville	ps107@evansville.edu
Neena	Smith-Bankhead	Clayton State University	Neena Smith-Bankhead@clayton.edu
Aaron	Spaulding	Mayo Clinic Jacksonville	spaulding.aaron@mayo.edu
Robert	Spinelli	University of Scranton	Robert.spinelli@scranton.edu
Charles	Stivason	Marshall University	stivason@marshall.edu
William	Stroube	University of Evansville	bs52@evansville.edu
Steven	Szydlowski	University of Scranton	steven.szydlowski@scranton.edu
Aurora	Tafili	University of North Florida	aurora.tafili@unf.edu
Priyanka	Tetali	University of Scranton	priyatetali@gmail.com
Aisha	Tijjani	University of Evansville	at166@evansville.edu
Betty	Toth	St. Elisabeth University of Health and Social Work	betty.toth.foto@gmail.com

Abraham D.	Traore	University of Evansville	at199@evansville.edu
Daniel J.	West, Jr.	University of Scranton	daniel.west@scranton.edu
Cynthia	White-Williams	University of North Florida	cynthia.white-williams@unf.edu
Nicolette	Wickes	University of Evansville	nw123@evansville.edu
John	Wiercinski	University of Scranton	john.wiercinski@scranton.edu
William K.	Willis	Marshall University	Willis23@marshall.edu
Brianna	Windsor	University of Scranton	brianna.windsor@scranton.edu
Gene	Wunder	Washburn University (Emeritus)	dr1drphd@gmail.com
Judy K.	Wunder	Wunder Consulting Group	dr1drphd@gmail.com
Jing	Xu	University of North Florida	jasper.xu@unf.edu
Solomon J.	Yniguez	University of Houston – Clear Lake	solomon.yniguez@gmail.com
Mustafa Z.	Younis	Jackson State University	Mustafa.younis@jsums.edu
Mei	Zhao	University of North Florida	mzhao@unf.edu