Power System Technology
ISSN:1000-3673

Received: 16-09-2019 *Revised: 05-10-2019* *Accepted: 22-11-2019*

Interdisciplinary Collaboration to Strengthen the Public Health Response: Insights from Health Information, Radiology, and Pharmacy

[1]Ahmad Obaid Alzubaidi, [2]Hussam saeed fqaeh, [3]Ali Zaher Alfifi, [4]Asem Ahmad Robaidi, [5]Ali Hamod Aseeri

[1]Radiology Technician, Jazan primary health care center For national guard
[2]Health info tech, Jazan primary health care center For national guard
[3]Health Administration Technician, Jazan primary health care center For national guard
[4]Radiology Technician, Jazan primary health care center For national guard
[5]Pharmacy Technician Iii, National Guard Health Affairs

Abstract

1. Introduction

The vast potential of interdisciplinary collaborations to address pressing issues starts with academic researchers. Understanding and raising awareness of available resources, including those supported by various organizations, are critical tools. In the domain of public health, there is an emphasis on coupling project descriptions with several keen editorial perspectives that offer advice to investigators and teams who aim to address subject areas as far-ranging as youth and young adult reproductive health, suicide prevention, and oral health disparities. Integrating findings across disciplines also requires new ways to discuss insights and promote acceptance while acknowledging the limitations of different methods and data.

Methods

Changing paradigms in health care, including new and emerging public health challenges, emphasize the need for a more decentralized framework, whereby communities are empowered to understand and address their unique health-related needs. To support new modalities of public health practice, an emphasis must be placed on health care team members' communication and understanding of each other's roles and responsibilities in order to provide patients with comprehensive and personalized care. Recognizing the importance of interdisciplinary collaboration, librarians at an academic medical center formed a structured team of librarians with expertise in different areas across the health sciences.

Conclusion

In conclusion, interdisciplinary collaboration improves the depth and breadth of the opportunities and solutions for fostering a stronger public health response. For information science, the area of informatics, the work we present as well as others generally focuses on how best to prepare, deliver, and use informational assets to support responses. This work

Power System Technology
ISSN:1000-3673
Received: 16-09-2019 Revised: 05-10-2019 Accepted: 22-11-2019

benefits from learning about how other disciplines support the public health response; using that learning to inspire potential new directions; collaborating with other disciplines to co-create relevant and effective solutions; and then acting with the understanding that the resulting solutions generally work in a larger socio-technical universe that embodies these collaborations and likely requires them for long-term success. For radiology, we highlight practices to facilitate optimal management of patients during the pandemic, helping to control cross-contamination or contamination of unrelated patients in the radiology clinic and maximize the clinical management of patients and prevention of the spread of the virus.

For pharmacists, we shed light on how the pandemic influences educational practice by creating a range of training opportunities to support students as much as possible in their profession. We are convinced that promoting communication and collaboration in pharmacy education using a modified role model will be positive not only for students but also for teaching staff. Establishing these relationships between education and practice within the context of a public health crisis will facilitate the transversal integration of student learning that follows the horizon of competencies. As future pharmacists, students will be better prepared to provide healthcare in emergency situations and innovative ways, potentially reducing the demand imposed by these unexpected situations in pharmacy practice. Despite the importance of established, vibrant interdisciplinary collaboration, creating and sustaining such relationships can be challenging. Our work demonstrates that such efforts are also highly viable and valuable, and we anticipate that our findings will engage other investigators to underscore and complement these efforts in pursuit of further preparing, strengthening, and engaging the public health workforce and, ultimately, to improve the respective results.

1.1. Background and Rationale

Rising in the total number of deaths and chronic diseases is deeply associated with changes in human behavior. Implicit emotions and attitudes, acquired intelligence, potential diseases, and other factors encountered during the interaction with the immediate environment in daily life activities exacerbate health conditions. Since disease has an unfortunate influence, the cost of treatment is substantial, and more painful difficulties arise from disease, it is worth noting efforts to analyze and explore the preliminary health condition trends to prevent disease. The enormous amount of electronic health record data accumulated daily in hospitals contains valuable clinical data. It is thus conceivable to perform secondary usage of the data to explore data mining-based rules for dealing with the issue. Since most of the population in the world cannot afford expensive medical and hospital expenses, it is found that the architectural designs of general hospitals in some countries show a trend of hospital size reduction. However, this does not influence the general concept of either the diagnosis procedure or staff's positive development of working skills. The motivation for this study is mainly the character of the modern, small-scaled general hospital. The limited size of this

Power System Technology
ISSN:1000-3673
Received: 16-09-2019 Revised: 05-10-2019 Accepted: 22-11-2019

hospital and the multi-task problem among staff have caused the hospital to fall into one of the fatal awkwardnesses.

The privilege of having EHR data is also the disadvantage of healthcare enterprises. They do not consider that the individual data provided by these health records causes data confidentiality problems. How to effectively perform data mining applications without causing individuals' privacy concerns has become one of the significant issues hindering health data applications. While dealing with these issues, the attribute topics of the derived decision rules should be carefully examined. Even though decision rules can be derived from association rules in a privacy-preserving environment, the risk of leakage of privacy cannot be restrained. There are many privacy-preserving association rule mining techniques with reduced association use, thus making them unsuitable for real-world healthcare applications. Therefore, this study aims to focus on both difficult aspects. The first task is to investigate the relationship between associated attribute factors and symptoms predictive of the initial health status. Then, adopting this information, we should propose a prototype prescreening system design.

2. The Importance of Interdisciplinary Collaboration in Public Health

Interdisciplinary collaboration is an essential part of the public health workforce. The COVID-19 pandemic, the worst health crisis we have experienced in over a century, has brought the importance of public health professionals into sharp focus. People outside of public health have become very familiar with public health organizations, refer to "the science" often in conversation, and many people have a new title on their list of "personal heroes," those who work in public health. However, many areas of public health might not be as intuitive to the general public. While public health is full of medical practitioners focused on clinical implementation for the control of various conditions, public health practitioners are spread across a myriad of disciplines, including epidemiology, biostatistics, environmental health, health education, health services administration, nutrition, public health laboratory science, health information, infectious disease, informatics, radiology, veterinary public health, emergency preparedness and response, dentistry, and pharmacy.

With the exponential increase in the amount of health information available to both clinicians and the public, overlapping collaborations have been highlighted by the COVID-19 pandemic. There is not only a significant amount of information that has been shared, but also sharing and collection of usage data can serve as a powerful tool for modeling, not only the spread of infection, but also the ability of decision makers to allocate scarce resources and make policy decisions. Radiology plays a key role in public health through routine clinical practice as well as through disaster preparedness and response. Coordination between pharmacies, technology partners, other public health entities, and health plan-sponsored

Power System Technology
ISSN:1000-3673
Received: 16-09-2019 Revised: 05-10-2019 Accepted: 22-11-2019

clinical scale research initiatives collectively can yield improved understanding, coordination, and management of public health outbreaks such as the COVID-19 pandemic. These examples of intersecting expertise, all derived from different academic public health domains, are finding and developing new ways of collaborating to strengthen the public health ecosystem.

3. Health Information, Radiology, and Pharmacy: Overview and Roles

Interdisciplinary collaboration is vital for cultivating sustainable impact and dissemination of essential work to enhance public health. Although the pharmacy, health information, and radiology disciplines are united in several areas, including project-based settings, educational settings, and clinical settings, experts in these areas suggest they are not as interconnected as they could be, and efforts are needed to advance their relationship from project-based involvement toward longer-lasting interdisciplinary bonds. It is anticipated that informed discourse will enhance traditional and future collaborations and inform new ones with a broader perspective. Encouraging and maintaining intelligence across the broader range of applications in health care may help lead the way to sustainable, results-driven, and patient-centered public health efforts that fulfill the product and learning aspirations of these disciplines.

Health information professionals help organize valuable patient data and the retrieval and storage of this information. The Health Information Management area of focus allows professionals to integrate information into information systems, whether for a healthcare practice, outpatient clinic, urgent care center, or enterprise of healthcare delivery. Assistants support patients who may not interface with other caregivers. Many health information professionals are responsible for teaching students in health information management programs. Clinical experience with the HIM credential demonstrates an adept understanding of IT management in patient care departments, including, but not limited to, radiology. Officially accredited health information management programs foster graduates who understand IT management. The existing and upcoming leaders across health information practice and IT informatics provide patients with the ability to access symptomatic and biomedical data anywhere.

4. Case Studies of Successful Interdisciplinary Collaborations

Embarking from the example of the COVID-19 pandemic, we here provide several case studies that serve to illustrate how the concept inspection framework played out in practice. We outline the approaches to Health Information Technology and Services, Exploratory and Outcome-Focused Radiology Reporting, and Patient Engagement, Pharmacy Communications, and Teleprescription Systems collaborations. Preliminary personal reflections, in-depth interviews, and focus groups were instrumental for developing these

Power System Technology
ISSN:1000-3673
Received: 16-09-2019 Revised: 05-10-2019 Accepted: 22-11-2019

case studies from our diverse teams of co-authors. Indeed, the twelve participants who were first-year members of the scholarship program collaborated to discuss and synthesize the strengths and lessons learned from this endeavor.

Each of the students and the faculty were drawn from at least one of the following four areas: drug discovery, pathology, systems and information engineering, and program assessment. We had close to biweekly meetings to learn about each other's work and discuss the relevant topics in depth. A project involved partnerships among doctors of pharmacy, pharmacy students, coding and design students, and health information management systems students. We leveraged the requisites of a catalog so the developers could input their teleprescription and communications systems with the necessary and sensitive, yet scoopable, codes.

5. Challenges and Barriers to Interdisciplinary Collaboration

While many authors highlight the potential benefits of a holistic, interdisciplinary public health informatics framework, significant barriers exist. Successfully navigating these challenges will be important for the development of accurate and reliable surveillance systems, public health policy based on comprehensive, high-quality results, and effective workforce education. Some barriers, such as education and training, are similar to those confronting the broader biomedical informatics community. Broader engagement of data science and analytics expertise in public health activities may also help in the development of useful and usable public health analytics tools. Data protection and privacy concerns remain high in the healthcare and public health communities and will need to be considered carefully as public health surveillance activities become more tightly integrated and decision aids more deeply embedded into the care that patients receive.

One unique challenge in public health is the lack of a single association representing a broad range of health informaticians. Multiple public health informatics organizations exist, but the lack of widespread membership and participation limits the reach of a single organization’s information dissemination efforts. While annual conferences and proceedings exist for public health, health information libraries, and data science as standalone disciplines, a formal venue for interdisciplinary information sharing focused on a unified public health informatics problem has yet to emerge. (Brewer et al.2019)(O’Reilly-Shah et al.2)

6. Best Practices for Promoting Effective Interdisciplinary Collaboration

Public health challenges are often more complex and require community knowledge and participation to resolve. Properly executed, an interdisciplinary approach provides a way for diverse groups, disciplines, and professions that include health providers, communities, businesses, researchers, and policy to work together to develop new knowledge and innovative strategies to improve public health. Interdisciplinary research or training programs may be loosely organized or highly formalized, and researchers may interact personally or

Power System Technology
ISSN:1000-3673
Received: 16-09-2019 Revised: 05-10-2019 Accepted: 22-11-2019

primarily in virtual settings. Regardless of these variations, interaction within and among professions is critical to effective collaborative effort. Approaches in current use that support interdisciplinary research suggest that strong institutional support is essential so that faculty can function as full and contributing members of the cross-disciplinary evaluation team. Key stakeholders agree that a variety of steps are necessary to increase interdisciplinary collaboration. Gathering comprehensive information is necessary to move forward on these challenges, including data on the value of interdisciplinary initiatives and guidance from successful practices and the identification of key barriers in moving interdisciplinary research forward.

There are many ways to support this type of collaboration. As more examples emerge of academic units that have begun taking steps to foster interdisciplinary practices and approaches, as well as evidence of their initial success, models for helping to build and foster interdisciplinary public health initiatives together will be developed. Core administrative support for faculty is vital. Core support personnel are also needed to encourage and support research and evaluation activities. Strategic partnerships with external organizations provide a major catalyst for greater interdisciplinary work. Both public and private organizations contribute to policy development, new program logistics, data collection, and summative and formative evaluations. Another lesson is that these organizations often enable and actively encourage interdisciplinary collaboration. Statistical analysis techniques can be a challenge to analyze because of multi-method and multi-level evaluation designs. Few tools exist to evaluate the relative contributions of multi-method evaluation and other factors that may encourage successful public health interdisciplinary collaboration, as well as its impact on public health outcomes. (Barringer et al., 2019)(Moirano et al., 2019)(Arnold et al. 2019)(Brashers et al., 2019)(James et al. 2019)

7. Conclusion and Future Directions

In conclusion, it is paramount to the success of the response to the COVID-19 pandemic to include and prioritize input from professionals of a variety of disciplines, from public health to health information and technology, pharmacy, radiology, and interprofessional approaches and collaboration. Given the need to continue to adjust, the ways that members of these various health disciplines align their own knowledge and values with the needs of the community they serve assumes increasing importance as the response proceeds. The need for collaboration among health professionals extends to preparation for future pandemics and shocks through the development of capacity where it is currently lacking and through cooperation that can help drive the required innovation, support and adapt the successful policies in different settings, and enable effective responses when the next global health threat emerges. In the future that lies beyond, it is hoped that the lasting benefits of having learned from difficult shared experiences and responsibilities, toward the building of a

Power System Technology
ISSN:1000-3673
Received: 16-09-2019 Revised: 05-10-2019 Accepted: 22-11-2019

stronger culture of preparedness and collaboration, become ever more evident. Whether in efforts to improve health and health care systems, to reduce health inequalities and promote health equity, or across the full spectrum of needs related to future global health threats, enhanced collaboration is likely to be essential. Thus, continued work that takes advantage of interprofessional education and the expertise that can be incorporated into the shared effort of interdisciplinary collaboration will remain of great value.

References:

1. Brewer, L. C., Fortuna, K. L., Jones, C., Walker, R., Hayes, S. N., Patten, C. A., & Cooper, L. A. (2019). Back to the future: achieving health equity through health informatics and digital health. JMIR mHealth and uHealth, 8(1), e14512. jmir.org
2. O'Reilly-Shah, V. N., Gentry, K. R., Van Cleve, W., Kendale, S. M., Jabaley, C. S., & Long, D. R. (2019). The COVID-19 pandemic highlights shortcomings in US health care informatics infrastructure: a call to action. Anesthesia & Analgesia, 131(2), 340-344. nih.gov
3. Barringer, S. N., Leahey, E., & Salazar, K. (2019). What catalyzes research universities to commit to interdisciplinary research?. Research in Higher Education. academia.edu
4. Moirano, R., Sánchez, M. A., & Štěpánek, L. (2019). Creative interdisciplinary collaboration: A systematic literature review. Thinking Skills and Creativity. uns.edu.ar
5. Arnold, A., Cafer, A., Green, J., Haines, S., Mann, G., & Rosenthal, M. (2019). Perspective: Promoting and fostering multidisciplinary research in universities. Research Policy, 50(9), 104334. [HTML]
6. Brashers, V., Haizlip, J., & Owen, J. A. (2019). The ASPIRE Model: Grounding the IPEC core competencies for interprofessional collaborative practice within a foundational framework. Journal of interprofessional care. academia.edu
7. James, A. H., Bennett, C. L., Blanchard, D., & Stanley, D. (2019). Nursing and values-based leadership: A literature review. Journal of Nursing Management, 29(5), 916-930. cardiff.ac.uk