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Enhancing Public Health Outcomes through Interdisciplinary Collaboration: A Literature Review of Epidemiology Technicians, Nursing, Dental Care, Radiology, Health Informatics, and Health Assistant

Ibrahim Mohammed Namis[1], Ali Mohammed Muqri[2], Mahmoud Mohamed Mogri[3], Abdu Hassan Jaffery[4], Ali Abduo Kafat[5], Mousa Yahia Alfaifi[6], Turki Mohammed Darweesh[2], Ali Saeed Alahmari[7], Fatima Gassim Ali Ahmadi[8], Washela Gassim Ali Ahmadi[8], Laila Mohammed Abiri[9], Nasser Mohammed Gahtani[10]

1. Senior Nurse Specialist, Jazan Specialist Hospital
2. Epidemiology Technician, Public Health Ministry of Health Branch in Jazan
3. Epidemiology Technician, Jizan General Hospital
4. Radiologist, Jazan Health Cluster
5. Health Informatics Technician, Jazan - Sabya, Jazan Health Cluster
6. Male Nurse, Jazan Health Cluster
7. Dentist, Jazan Health Cluster
8. Nursing Technician, Jazan - Sabya, Jazan Health Cluster
9. Health Assistant, Central Primary Care Sector, Jazan Health Cluster
10. Nurse Specialist, Mobile Clinics, Jazan Cluster

ABSTRACT

Introduction: The Public Health Outcomes Framework (PHOF) aims to enhance and safeguard the nation's health, particularly for the poorest. It focuses on two high-level outcomes: increased healthy life expectancy and reduced differences in life expectancy and healthy life expectancy between communities, aiming to improve health outcomes across the public health system.

Aim of work: To provide a comprehensive assessment of the interdisciplinary collaboration of the epidemiology technicians, nursing, dental care, radiology, health informatics, and health assistant in enhancing public health outcomes.

Methods: We conducted a comprehensive search in the MEDLINE database's electronic literature using the following search terms: Enhancing, Public, Health, Outcomes, Interdisciplinary, Collaboration Epidemiology Technicians, Nursing, Dental Care, Radiology, Health Informatics, and Health Assistant. The search was restricted to publications from 2016 to 2024 in order to locate relevant content. I performed a search on Google Scholar to locate and examine academic papers that pertain to my subject matter. The selection of articles was impacted by certain criteria for inclusion.

Results: The publications analyzed in this study encompassed from 2016 to 2024. The study was structured into various sections with specific headings in the discussion section.

Conclusion: Epidemiology technicians are vital in public health, enabling understanding of health-related events and outcomes. They collect data, identify outbreaks, and implement control measures. Nurses help people navigate healthcare systems, providing culturally respectful care. Radiologists and public health professionals collaborate to develop screening and prevention programs. Radiology is a vital tool in public health, providing information for disease screening and prevention. Dental care addresses structural inequities and promotes public health by incorporating cultural humility. Collaboration between epidemiology technicians, nursing, dental care, radiology, health informatics, and health assistant maximize its potential in promoting public health and reducing disease burden.

KEYWORDS: Enhancing, Public, Health, Outcomes, Interdisciplinary, Collaboration Epidemiology Technicians, Nursing, Dental Care, Radiology, Health Informatics, and Health Assistant.

1. Introduction

There is increased healthcare demand for interdisciplinary professionals to collaborate, design, and advance the work processes and work results' quality and productivity due to the downsizing of healthcare costs and increasing quality. Morley and Cashell (2017) have defined interprofessional collaborative practice in terms of collaboration, coordination, and shared decision-making mechanisms involving patients, clinicians, and their families (Morley & Cashell, 2017).

To make patients, relatives, and other consumers of health care services involved in health care delivery, the multifunctional teams make copious functional capacities available in the work situation. These teams can be more effective, efficient, innovative, and good in risk management than purely functional teams by allowing many ideas, considerations, and compromises, all of which can result in costly errors. Hence, there is a need to solve them early before much time is wasted (Javaid et al., 2024).

Coordination means cooperation, the joint action, and knowledge of two bodies; therefore, the proper division of power is pertinent. A helpful breakdown of the behaviors and attitudes that make up collaborative practice in healthcare can be found in Sullivan's four essential elements: Partnership, which means open, long-term, equal, and fair collaboration; cooperation, which refers to contribution, recognition, and appreciation of other team members; shared decision making which entails negotiation, communication, respect, trust, and balanced power; and coordinate which mean working to achieve set goals (Tatus, 2016).

Multiple sources show that integrated teams make better decisions, increase creativity, and improve communication of knowledge and practices across disciplines (Pelone et al., 2017). In terms of measures, cooperative cooperation could lead to an improved number of days the patients have to stay in the hospital,

improved compliance with prescribers' orders on medication, improved audits, and improved symptom and psychosocial outcomes. Besides improving patient care, a collaborative staff will be more attentive, responsible, and efficient in patient, family, and community responsibilities (Peduzzi & Agreli, 2018).

2. AIM OF WORK

To provide a comprehensive assessment of the interdisciplinary collaboration of the epidemiology technicians, nursing, dental care, radiology, health informatics, and health assistant in enhancing public health outcomes.

3. METHODS

A comprehensive search was conducted on recognized scientific platforms, including Google Scholar and Pubmed, using specific keywords such as Enhancing, Public, Health, Outcomes, Interdisciplinary, Collaboration Epidemiology Technicians, Nursing, Dental Care, Radiology, Health Informatics, and Health Assistant. The aim was to gather all relevant research papers. The articles were chosen according to certain criteria. Upon conducting a comprehensive analysis of the abstracts and notable titles of each publication, we eliminated case reports, duplicate articles, and publications without full information. The reviews included in this research were published from 2016 to 2024.

4. RESULTS

The current investigation concentrated on the interdisciplinary collaboration of the epidemiology technicians, nursing, dental care, radiology, health informatics, and health assistant in enhancing public health outcomes between 2016 and 2024. As a result, the review was published under many headlines in the discussion area, including: Health informatics and improving public health outcomes, Epidemiology technicians and public health outcomes, Nursing role in enhancing public health outcomes, Importance of Radiology in Public Health and Impact of dental care on public health outcomes.

5. DISCUSSION

Health informatics and improving public health outcomes

The multidisciplinary discipline of public health informatics uses computer technology and information to improve public health practice, research, and education. The application of technology in healthcare is included in the subfield of biomedical or health informatics. By defining the science, how, and why of health IT, health informatics empowers experts to address network connection infrastructure issues. Public health informaticians may assist public health choices by facilitating the availability of timely, relevant, and high-quality information. They

must suggest using computer science, information science, or technology to accomplish public health objectives more quickly, effectively, or affordably (Williams et al., 2019).

In the United States, the Health Information Technology for Economic and Clinical Health (HITECH) Act provides incentives for Electronic Health Records (EHR) and Health Information Technology (HIE) systems. The legislation allows financing for the Office of the National Coordinator for Health Information Technology (ONC) and Medicaid and Medicare financial incentives for providers to embrace and utilize EHRs. By 2014, the objective is to increase and encourage the use of health information technology to modernize the health system (Yuan & Wu 2021).

Electronic laboratory reporting may increase the effect of public health informatics on public health surveillance by improving the speed and completeness of reporting while influencing the workload and workflow of surveillance (Dixon & Grannis, 2020). Data entering into case management software may be eliminated by interoperability across computer programs and systems, increasing productivity and lowering mistakes and resource needs. Bidirectional communication about instances or clusters of diseases may become more possible when public health professionals and doctors use interoperable data in more electronic settings (Yogesh & Karthikeyan, 2022).

Participants must deploy approved technology and show that they are using it meaningfully to be eligible for incentive payments for using EHR technology. For surveillance systems, EHRs must capture demographic information and other pertinent data. By 2015, financial penalties are expected to be implemented. By cutting costs, breaking down silos, and enhancing access to timely, high-quality information, public health informaticians are invaluable assets for strengthening public health monitoring and health outcomes (Dixon, 2022).

Epidemiology technicians and public health outcomes

This notion is made possible by the specialty of epidemiology, which is deemed to be an essential tool in public health. Data capture, epidemic identification, resource utilization decisions, and control actions are all contingent on field epidemiological processes. An Epi team may be enlisted to achieve epidemiological and public health goals and objectives when staff constraints or resources are lacking (Carneiro, 2018).

Epi teams consist of several specific subspecialties, which give an agency support and aid when needed. They may implement an enhanced epidemic response system that will contain the parsers: Surveillance of the epidemic data, Investigation activities, Control measures after identification of an epidemic, Surveillance after identification of an epidemic, and Initial Surveillance. Besides, they can help start daily check-ups and review existing information about illnesses (Akram, H. 2017).

The head of an Epi team is an epidemiologist or another professional knowing the principles of epidemic studying and public health epidemiology. This team comprises a public information officer, planners in epidemiology, environmental health or sanitation professionals, clinical/nursing persons, health educators, preparation workers, and epidemiology-qualified personnel. This entails conducting training and meetings often, as well as making necessary alliances with stakeholders

to monitor epidemiological activities in the country, which are some of the roles undertaken by the team in question. As such, for the Epi team members to effectively manage and learn about the fundamental protocols on privacy and health information security, they ought to have been trained in the Incident Command System (ICS) as well as HIPAA. The formation of Epi teams may yield early, rapid, and appropriate reactions to numerous public health concerns (Balajee et al., 2016).

Nursing role in enhancing public health outcomes

For services to be equal and of high quality, healthcare quality is essential. By assisting patients in navigating the healthcare system, closely monitoring and following up, concentrating on the whole person, and delivering culturally sensitive treatment, nurses significantly contribute to improving this quality. Through care management, person-centered care, and cultural humility, they can overcome obstacles to high-quality care, such as unconscious prejudice and structural injustices (Flaubert et al., 2021).

Patients may need to comprehend the workings of the existing healthcare system, and treatment is often fragmented. As members of a healthcare team, nurses provide transitional care, care management, and care coordination to enhance communication, reduce fragmentation, and improve the quality and safety of treatment. People with complicated health and social requirements may need care from many providers, medication management, medical follow-up, and assistance in meeting their social needs, particularly need care management (Allen et al., 2020).

Incorporating social care into healthcare delivery models has given nurses vital roles in coordinating care across settings and providers, working with other professionals and community resources to enhance the health of people with complex social and health needs (Salmond & Echevarria, 2017).

Person-centered care is a paradigm that prioritizes the autonomy and choice of the individual, concentrating on their needs, preferences, and talents. Nurses work with patients, families, and caregivers to provide individualized, high-quality care that meets patients' physical, emotional, and social requirements. This method strongly emphasizes fostering antidiscriminatory care, honoring views and values, and codesigning interventions, services, and policies. Additionally, it emphasizes addressing factors including socioeconomic position, age, gender, sexual orientation, religion, color, ethnicity, and varying ability status (Moss & Phillips, 2020).

Studies have shown the effectiveness of person-centered care in lowering sadness, agitation, and neuropsychiatric symptoms while also enhancing the quality of life for dementia patients. It is person-directed, improving patient involvement in care and giving them enough knowledge to choose treatment. According to Bombard et al. (2018), nurses who include patients in their care are less likely to make errors and provide higher-quality care, increasing patient satisfaction, treatment adherence, and care outcomes (Bombard et al. 2018).

Nurses must possess cultural humility to confront systemic injustices and provide high-quality, equitable treatment. All patients, regardless of their cultural or linguistic background, may get high-quality care from nurses if cultural humility is

included in nursing education and culturally and linguistically relevant treatments are offered. Nurses can lessen the impact of systemic injustices created by the healthcare system by being trained and equipped to respond on many levels (Catalan, R. E. 2024).

Importance of Radiology in Public Health

Because it provides essential information for disease screening and prevention, radiology is a vital tool for public health. It uses imaging methods such as MRIs, CT scans, and X-rays to help with early detection, precise diagnosis, and efficient treatment planning to improve health outcomes. Healthcare providers can identify people at risk for several illnesses, including cancer, heart disease, and musculoskeletal disorders, with the use of radiological screenings. For breast cancer, lung cancer, cardiovascular disease, and prostate cancer, mammograms, CT scans, and MRI are necessary; for prostate cancer, brain tumors, and musculoskeletal conditions, MRI is helpful (Alanzan et al., 2020). Additionally, radiology is crucial in stopping the spread of infectious diseases like HIV and tuberculosis. Cost, restricted access to radiological services, and cautious radiation exposure management are some obstacles to its implementation. Practical cooperation between radiologists and public health specialists is essential to fully utilize radiology's potential in advancing public health and lowering disease burden. Radiological imaging can identify illnesses early, treatments can be started on time, and general health results can be enhanced (Porembka et al., 2022).

Public health experts and radiologists work together to create efficient screening and prevention initiatives. With their proficiency in image interpretation, reporting, and quality control, radiologists guarantee precise diagnosis and suitable treatment. To provide fair access, education, and follow-up care for everyone, public health experts participate in the planning, executing, and assessing of these initiatives (Bárdyová et al., 2021).

The role of radiologists is crucial in image interpretation, providing detailed information about findings to facilitate appropriate management and treatment plans. Quality assurance measures are implemented to maintain high standards in radiological screening. Public health professionals focus on creating strategies that guarantee equitable access to radiological screenings for all individuals, regardless of their background or socioeconomic status (Sharma et al., 2024).

Collaborative efforts contribute to the overall effectiveness of radiological screening in reducing the burden of diseases and promoting public health. Future directions in radiology and public health include harnessing the power of Artificial Intelligence (AI) to improve diagnosis speed and accuracy and integrating radiological imaging with electronic health records and registries to unlock powerful data-driven approaches for screening and prevention (Al Faraj et al., 2023).

Impact of dental care on public health outcomes

Common chronic conditions like oral disorders may have a significant influence on society and the healthcare system, as well as cause a lot of morbidity. According to Peres et al. (2019), untreated dental issues may result in hospital emergency rooms, lost productivity, and poor academic and professional performance. Unplanned

dental care costs the United States 92 million work or school hours annually, whereas it costs 40 million in Canada. Children with lower dental health are more likely to skip school and do poorly academically, with an annual cost effect of more than $1 billion. In 2010, major dental problems caused yearly indirect expenditures of about 144 billion dollars worldwide. Due to heavily privatized dental care systems, income-related disparities still exist, and the COVID-19 epidemic has made them more pronounced. There is little empirical data to show how expanding access to dental care might affect healthcare and societal outcomes, even though providing dental care via different programs may assist in preventing these expensive effects (Jin et al., 2016).

There is interest in how dental care programs affect social results, especially when considering healthcare and societal health. Studies that looked at the effects of dental care programs from social and medical viewpoints were found using a search method. The number of treatments avoided, spending and cost savings, and service usage were the discovered healthcare outcomes. The number and caliber of studies examining how dental programs affect future expenditure and cost savings produced weaker and less conclusive results despite some evidence that they can lower medical and dental healthcare utilization and prevent more invasive treatments (Zare et al., 2024).

Very little data has been found about the effects of dentistry programs on homelessness and employment in terms of social outcomes. Veterans who received dental care through the national veteran rehabilitation program had a higher chance of finding permanent housing and becoming more financially stable than those who did not, according to a study on homeless veterans (adults and elders) (Leonardo, 2023).

Because they are less expensive and financially sustainable, diagnostic and preventative dentistry programs are the most popular. However, the ambiguity around the services offered continues to be a significant reporting issue. Furthermore, research evaluated the effects of "comprehensive dental programs," which makes it difficult to determine how interventional dental treatment affected the outcomes under investigation. More attention needs to be paid to analyzing how dental programs affect other societal outcomes, like school attendance, academic performance, economic productivity, quality of life, and social interactions, even though these programs have been successful in lowering the societal and financial burden of dental diseases (Ghoneim et al., 2022).

6. CONCLUSION

Epidemiology technicians are essential in public health because they make it possible to comprehend the distribution and contributing factors of health-related occurrences and results. For prompt data collection, epidemic detection, resource allocation, and control measure execution, field epidemiological operations are crucial. Epi teams comprise various interdisciplinary specialists who help and strengthen agencies in times of crisis. They need training in the incident command system (ICS) and HIPAA to understand fundamental privacy concepts and security measures for

protecting health information.

Nurses play a critical role in improving public health outcomes through careful monitoring and follow-up, culturally sensitive treatment, concentrating on the complete person, and assisting individuals in navigating the healthcare system. Through person-centered care, care management, and cultural humility, they can overcome obstacles to high-quality care, such as unconscious prejudice and structural injustices.

Together, radiologists and public health experts create successful screening and preventive initiatives. Public health specialists guarantee that everyone has fair access to education, follow-up treatment, image interpretation, reporting, and quality assurance. Working together helps promote public health and reduce sickness. Using AI to diagnose patients more quickly and combining radiological imaging with electronic health information are examples of prospects.

Dental care is essential for combating systemic injustices and advancing public health. Nurses can give all patients high-quality, equitable care by integrating cultural humility into nursing education and offering treatments suitable for each patient's culture and language. With its ability to provide critical information for disease screening and prevention, radiology is an essential public health tool. It assists in identifying those who may be at risk for chronic conditions, including cancer, heart disease, and musculoskeletal issues. Maximizing radiology's ability to advance public health and lessen the burden of illness requires cooperation between radiologists and public health specialists.

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