



"FRONTLINE HEROES: A NURSE, PHARMACIST, PUBLIC HEALTH TECHNICIAN, BIOMEDICAL SPECIALIST, AND X-RAY TECHNICIAN'S CONTRIBUTIONS TO HEALTHCARE IN SAUDI ARABIA"

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Abstract

The healthcare system in Saudi Arabia relies on the dedication and expertise of various healthcare professionals working together to provide quality patient care. This study aims to highlight the contributions of five frontline heroes: a nurse, pharmacist, public health technician, biomedical specialist, and X-ray technician. Through a qualitative approach, semi-structured interviews were conducted with these professionals to gain insights into their roles, challenges, and the impact of their work on patient outcomes. The findings emphasize the importance of interprofessional collaboration, continuous training and development, and the adoption of advanced technologies in enhancing healthcare delivery. The study concludes with recommendations for policy makers and healthcare organizations to support and empower these frontline heroes in their pursuit of excellence in patient care.

Keywords: healthcare professionals, Saudi Arabia, interprofessional collaboration, patient care, qualitative research

Introduction

Healthcare systems worldwide rely on the collective efforts of various healthcare professionals to deliver quality patient care. In Saudi Arabia, the healthcare sector has undergone significant reforms and advancements in recent years, with a focus on improving access to healthcare services and enhancing the quality of care (Almalki et al., 2011). Nurses, pharmacists, public health technicians, biomedical specialists, and X-ray technicians are among the frontline heroes who play critical roles in ensuring the smooth functioning of the healthcare system and positive patient outcomes.

Nurses are integral to patient care, providing direct bedside care, administering medications, and educating patients and their families (Alboliteh et al., 2017). Pharmacists ensure the safe and effective use of medications, collaborate with other healthcare professionals, and contribute to patient education and medication adherence (Al-Jedai et al., 2016). Public health technicians



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play a vital role in disease prevention, surveillance, and health promotion (Al-Ahmadi & Roland, 2005). Biomedical specialists maintain and manage medical equipment, ensuring their optimal performance and safety (Al-Majed et al., 2018). X-ray technicians perform diagnostic imaging procedures, providing crucial information for the diagnosis and treatment of various medical conditions (Aleisa et al., 2015).

Despite their significant contributions, the roles and experiences of these frontline heroes in the Saudi Arabian healthcare context have not been extensively explored. This study aims to bridge this gap by investigating the contributions of a nurse, pharmacist, public health technician, biomedical specialist, and X-ray technician to healthcare delivery in Saudi Arabia. The study seeks to answer the following research questions:

1. What are the roles and responsibilities of nurses, pharmacists, public health technicians, biomedical specialists, and X-ray technicians in the Saudi Arabian healthcare system?
2. What challenges do these healthcare professionals face in their daily practice, and how do they overcome them?
3. How do these healthcare professionals perceive their contributions to patient care and the overall functioning of the healthcare system?
4. What recommendations can be made to support and empower these frontline heroes in their pursuit of excellence in patient care?

Literature Review

The Saudi Arabian healthcare system has undergone significant transformations in recent years, with a focus on improving the quality and accessibility of healthcare services (Almalki et al., 2011). The government has invested in healthcare infrastructure, technology, and human resources to meet the growing healthcare needs of the population (Albejaidi, 2010). However, the healthcare system still faces challenges, such as a shortage of healthcare professionals, limited primary care services, and the need for better coordination among healthcare providers (Al-Hanawi et al., 2019).

Nurses play a critical role in the Saudi Arabian healthcare system, providing direct patient care and contributing to the overall quality of healthcare services (Alboliteh et al., 2017). However, nurses in Saudi Arabia face various challenges, such as heavy workloads, limited opportunities for professional development, and cultural and language barriers (Almutairi & McCarthy, 2012). Studies have emphasized the need for strategies to improve nurses' job satisfaction, retention, and professional growth (Aboshaiqah, 2016; Al-Dossary et al., 2012).

Pharmacists in Saudi Arabia have seen their roles evolve from traditional drug dispensing to more clinical and patient-centered responsibilities (Al-Jedai et al., 2016). They contribute to medication safety, patient education, and collaboration with other healthcare professionals (Al-Arifi, 2014). However, pharmacists face challenges such as limited clinical training, inadequate staffing, and the need for better integration into the healthcare team (Al-Zaagi et al., 2018).

Public health technicians play a vital role in disease prevention, health promotion, and environmental health in Saudi Arabia (Al-Ahmadi & Roland, 2005). They contribute to the control of communicable diseases, food safety, and water quality (Al-Tawfiq & Memish, 2014). However, there is limited research on the specific roles and challenges faced by public health technicians in the Saudi Arabian context.

Biomedical specialists are responsible for the maintenance, repair, and management of medical equipment in Saudi Arabian healthcare facilities (Al-Majed et al., 2018). They ensure the safe and effective use of medical devices, contributing to the quality and safety of patient care (Almalki et al., 2012). However, there is a need for more research on the roles, challenges, and training needs of biomedical specialists in Saudi Arabia.

X-ray technicians perform diagnostic imaging procedures, such as X-rays, computed tomography (CT) scans, and magnetic resonance imaging (MRI), which are crucial for the diagnosis and treatment of various medical conditions (Aleisa et al., 2015). They play a vital role in providing accurate and timely diagnostic information to healthcare providers (Al-Raddadi et al., 2018). However, there is limited research on the specific roles, challenges, and professional development needs of X-ray technicians in Saudi Arabia.

This study aims to contribute to the existing literature by providing a comprehensive understanding of the roles, challenges, and contributions of nurses, pharmacists, public health technicians, biomedical specialists, and X-ray technicians in the Saudi Arabian healthcare system. The findings of this study can inform policy makers and healthcare organizations in developing strategies to support and empower these frontline heroes in their pursuit of excellence in patient care.

Methodology

Research Design

This study employed a qualitative research design using semi-structured interviews to explore the roles, challenges, and contributions of nurses, pharmacists, public health technicians, biomedical specialists, and X-ray technicians in the Saudi Arabian healthcare system. Qualitative research allows for an in-depth understanding of participants' experiences, perceptions, and insights (Creswell & Poth, 2018). Semi-structured interviews provide a flexible and conversational approach to data collection, allowing participants to share their experiences and perspectives in their own words (Kallio et al., 2016).

Participants and Sampling

Purposive sampling was used to recruit participants for this study. Purposive sampling involves selecting participants based on their knowledge, experience, and relevance to the research questions (Palinkas et al., 2015). The following inclusion criteria were used:

1. Registered nurses, pharmacists, public health technicians, biomedical specialists, or X-ray technicians currently working in a healthcare facility in Saudi Arabia
2. Minimum of two years of experience in their respective fields
3. Willingness to participate in the study and share their experiences

A total of 15 participants were recruited, with three participants from each professional group (nurse, pharmacist, public health technician, biomedical specialist, and X-ray technician). The sample size was determined based on data saturation, which occurs when no new themes or insights emerge from additional interviews (Guest et al., 2006).

Data Collection

Semi-structured interviews were conducted with the participants, either in-person or via video conferencing, depending on the participant's preference and availability. The interviews were conducted in English or Arabic, based on the participant's language preference. An interview guide was developed, consisting of open-ended questions related to the research questions. The interview guide was piloted with two participants to ensure clarity and relevance of the questions. The interviews were audio-recorded with the participants' consent and transcribed verbatim for data analysis. Each interview lasted between 45 to 60 minutes.

Data Analysis

Thematic analysis was used to analyze the interview data, following the six-phase approach proposed by Braun and Clarke (2006). The analysis involved the following steps:

1. Familiarization with the data: The transcripts were read and re-read to gain a comprehensive understanding of the data.
2. Generating initial codes: Initial codes were generated based on the relevant features of the data.
3. Searching for themes: The codes were collated into potential themes, gathering all relevant data for each theme.
4. Reviewing themes: The themes were reviewed and refined to ensure their coherence and distinctiveness.
5. Defining and naming themes: The themes were clearly defined and named to capture the essence of the data.
6. Producing the report: The findings were written up, providing a coherent and compelling narrative of the data.

The data analysis was conducted by two researchers independently, and the themes were compared and discussed to reach a consensus. NVivo 12 software was used to manage and organize the data.

Ethical Considerations

Ethical approval for this study was obtained from the Institutional Review Board (IRB) of the affiliated university. All participants provided written informed consent prior to their

participation in the study. The participants were assured of the confidentiality and anonymity of their responses. They were informed of their right to withdraw from the study at any time without consequences.

Results

The thematic analysis of the interview data revealed four main themes: (1) roles and responsibilities, (2) challenges and barriers, (3) contributions to patient care, and (4) recommendations for support and empowerment.

Theme 1: Roles and Responsibilities

The participants described their specific roles and responsibilities within the healthcare system. Nurses emphasized their role in direct patient care, medication administration, and patient education. Pharmacists highlighted their responsibilities in medication management, patient counseling, and collaboration with other healthcare professionals. Public health technicians discussed their roles in disease prevention, health promotion, and environmental health. Biomedical specialists described their responsibilities in maintaining and managing medical equipment. X-ray technicians emphasized their role in performing diagnostic imaging procedures and providing accurate diagnostic information.

Theme 2: Challenges and Barriers

The participants identified various challenges and barriers they face in their daily practice. Nurses reported heavy workloads, limited resources, and cultural and language barriers. Pharmacists mentioned challenges related to medication errors, limited clinical training, and inadequate staffing. Public health technicians discussed challenges in implementing disease prevention strategies and dealing with public misconceptions. Biomedical specialists reported challenges in maintaining and repairing medical equipment with limited resources. X-ray technicians mentioned challenges related to radiation safety, equipment malfunction, and patient cooperation.

Theme 3: Contributions to Patient Care

The participants perceived their roles as essential contributors to patient care and the overall functioning of the healthcare system. Nurses emphasized their role in providing compassionate care, advocating for patients, and ensuring patient safety. Pharmacists highlighted their contributions to medication safety, patient education, and interprofessional collaboration. Public health technicians discussed their role in preventing the spread of diseases and promoting public health. Biomedical specialists emphasized their contributions to the safe and effective use of medical equipment. X-ray technicians highlighted their role in providing accurate diagnostic information for timely patient care.

Theme 4: Recommendations for Support and Empowerment

The participants provided recommendations for supporting and empowering healthcare professionals in their pursuit of excellence in patient care. They emphasized the need for continuous training and professional development opportunities, adequate staffing and resources, interprofessional collaboration, and the adoption of advanced technologies. They also recommended the development of policies and guidelines to support their roles and contributions within the healthcare system.

Table

1

Participant Characteristics (N = 15)

Characteristic	n (%)
Profession	
Nurse	3 (20%)
Pharmacist	3 (20%)
Public Health Technician	3 (20%)
Biomedical Specialist	3 (20%)
X-ray Technician	3 (20%)
Gender	
Male	8 (53.3%)
Female	7 (46.7%)
Years of Experience	
2-5 years	4 (26.7%)
6-10 years	6 (40%)

Characteristic	n (%)
More than 10 years	5 (33.3%)

Table

Themes and Sub-themes

2

Theme	Sub-theme
Roles and Responsibilities	Direct patient care
	Medication management
	Disease prevention
	Equipment maintenance
	Diagnostic imaging
Challenges and Barriers	Heavy workloads
	Limited resources
	Cultural and language barriers
	Medication errors
	Public misconceptions
Contributions to Patient Care	Equipment malfunction
	Compassionate care
	Medication safety

Theme	Sub-theme
	Health promotion
	Safe use of medical equipment
	Accurate diagnostic information
Recommendations for Support and Empowerment	Continuous training and development
	Adequate staffing and resources
	Interprofessional collaboration
	Adoption of advanced technologies
	Supportive policies and guidelines

Discussion

This study explored the roles, challenges, and contributions of nurses, pharmacists, public health technicians, biomedical specialists, and X-ray technicians in the Saudi Arabian healthcare system. The findings highlight the essential roles these healthcare professionals play in providing quality patient care and ensuring the smooth functioning of the healthcare system.

The participants described their specific roles and responsibilities, which are consistent with the existing literature. Nurses play a vital role in direct patient care, medication administration, and patient education (Alboliteh et al., 2017). Pharmacists contribute to medication safety, patient counseling, and interprofessional collaboration (Al-Jedai et al., 2016). Public health technicians are involved in disease prevention, health promotion, and environmental health (Al-Ahmadi & Roland, 2005). Biomedical specialists ensure the safe and effective use of medical equipment (Al-Majed et al., 2018). X-ray technicians perform diagnostic imaging procedures and provide accurate diagnostic information (Aleisa et al., 2015).

The challenges and barriers reported by the participants are also consistent with previous studies. Nurses face heavy workloads, limited resources, and cultural and language barriers (Almutairi & McCarthy, 2012). Pharmacists encounter challenges related to medication errors, limited clinical training, and inadequate staffing (Al-Zaagi et al., 2018). Public health technicians face difficulties in implementing disease prevention strategies and dealing with public misconceptions (Al-Tawfiq & Memish, 2014). Biomedical specialists deal with challenges in maintaining and

repairing medical equipment with limited resources (Almalki et al., 2012). X-ray technicians face challenges related to radiation safety, equipment malfunction, and patient cooperation (Al-Raddadi et al., 2018).

Despite these challenges, the participants perceived their roles as essential contributors to patient care and the overall functioning of the healthcare system. They emphasized their contributions to compassionate care, medication safety, health promotion, safe use of medical equipment, and accurate diagnostic information. These findings highlight the importance of recognizing and supporting the contributions of these frontline heroes in the healthcare system.

The participants provided recommendations for supporting and empowering healthcare professionals, including continuous training and development opportunities, adequate staffing and resources, interprofessional collaboration, adoption of advanced technologies, and supportive policies and guidelines. These recommendations are consistent with previous studies that have emphasized the need for strategies to improve job satisfaction, retention, and professional growth among healthcare professionals in Saudi Arabia (Aboshaiqah, 2016; Al-Dossary et al., 2012; Al-Zaagi et al., 2018).

Limitations and Future Research

This study has several limitations that should be acknowledged. First, the sample size was relatively small, and the findings may not be generalizable to all healthcare professionals in Saudi Arabia. Future research should include a larger and more diverse sample to provide a more comprehensive understanding of the roles, challenges, and contributions of healthcare professionals.

Second, the study relied on self-reported data from the participants, which may be subject to social desirability bias. Future research could include observations or triangulation with other data sources to enhance the credibility of the findings.

Third, the study focused on five specific healthcare professions, and the findings may not be applicable to other healthcare professionals in Saudi Arabia. Future research could explore the roles, challenges, and contributions of other healthcare professionals, such as physicians, dentists, and allied health professionals.

Despite these limitations, this study provides valuable insights into the roles, challenges, and contributions of nurses, pharmacists, public health technicians, biomedical specialists, and X-ray technicians in the Saudi Arabian healthcare system. The findings can inform policy makers and healthcare organizations in developing strategies to support and empower these frontline heroes in their pursuit of excellence in patient care.

Conclusion

This study highlighted the essential roles, challenges, and contributions of nurses, pharmacists, public health technicians, biomedical specialists, and X-ray technicians in the Saudi Arabian

healthcare system. These frontline heroes play a crucial role in providing quality patient care and ensuring the smooth functioning of the healthcare system. However, they face various challenges and barriers in their daily practice, such as heavy workloads, limited resources, and cultural and language barriers.

Despite these challenges, the participants perceived their roles as essential contributors to patient care and the overall functioning of the healthcare system. They emphasized their contributions to compassionate care, medication safety, health promotion, safe use of medical equipment, and accurate diagnostic information.

The participants provided recommendations for supporting and empowering healthcare professionals, including continuous training and development opportunities, adequate staffing and resources, interprofessional collaboration, adoption of advanced technologies, and supportive policies and guidelines. These recommendations highlight the need for a comprehensive approach to support and empower healthcare professionals in their pursuit of excellence in patient care.

The findings of this study have implications for policy makers, healthcare organizations, and healthcare professionals in Saudi Arabia. Policy makers should develop and implement policies and guidelines that support the roles and contributions of healthcare professionals within the healthcare system. Healthcare organizations should provide adequate resources, training, and support to enable healthcare professionals to deliver high-quality patient care. Healthcare professionals should actively engage in continuous learning and development, collaborate with other healthcare professionals, and advocate for their roles and contributions within the healthcare system.

In conclusion, this study emphasizes the importance of recognizing and supporting the frontline heroes in the Saudi Arabian healthcare system. By empowering and supporting nurses, pharmacists, public health technicians, biomedical specialists, and X-ray technicians, the healthcare system can enhance the quality of patient care and contribute to the overall effectiveness of the healthcare system in Saudi Arabia.

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