

## Barriers and Facilitators of Acceptance of Modern Technology among Healthcare Professionals at King Salman Armed Forces Hospital, Tabuk, Ksa.

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### ABSTRACT

**Introduction:** The adoption of modern technology in healthcare settings is pivotal for enhancing patient care and health outcomes.

**Objective:** This study aimed to explore the prevailing attitudes, perceptions, barriers, and facilitators influencing the acceptance and utilization of modern technology among healthcare professionals at the King Salman Armed Forces Hospital (KSAFH) in Tabuk, Saudi Arabia.

**Subjects and Methods:** Employing a quantitative research design, a cross-sectional survey was administered to 308 healthcare professionals, comprising doctors and nurses, at KSAFH.

**Results:** The findings unveiled generally positive attitudes towards technology adoption among healthcare professionals at KSAFH. They recognized its potential to enhance productivity, efficiency, and effectiveness in their work. Key facilitators identified included the presence of clear organizational policies and guidelines, as well as the perceived usefulness and ease of use of technology. However, several barriers were also revealed, including inadequate training and education, lack of organizational support, and cultural factors specific to the Saudi Arabian context.

**Conclusion:** This study underscores the importance of understanding the dynamics surrounding technology acceptance among healthcare professionals. It provides valuable insights that can inform the development of targeted strategies and interventions to optimize technology integration and improve patient care delivery within the healthcare system.

**Keywords:** Technology Adoption, Healthcare Professionals, Barriers, Facilitators, Saudi Arabia

### INTRODUCTION

The rapid advancements in modern technology have significantly transformed the healthcare landscape, offering new opportunities to enhance patient care, improve clinical outcomes, and streamline healthcare operations. The integration of technology, such as electronic health records, telemedicine, wearable devices and other technologies, have the potential to revolutionize the way healthcare services are delivered, leading to increased efficiency, better-informed decision-making, and improved patient experiences <sup>1</sup>.

However, the successful adoption and utilization of modern technology in healthcare settings often face various challenges, including resistance from healthcare professionals, organizational barriers, and cultural factors<sup>2</sup>. Understanding the factors that influence the acceptance and integration of technology among healthcare providers is crucial for healthcare organizations to effectively leverage the benefits of technological innovations and improve patient care <sup>3</sup>.

The existing literature on technology adoption in healthcare settings has identified a range of factors that can either facilitate or impede the successful integration of modern technology. These factors can be broadly categorized into individual, organizational, and environmental domains <sup>4</sup>.

At the individual level, healthcare professionals' attitudes, perceptions, and computer literacy have been found to significantly influence their acceptance and utilization of technology <sup>5</sup>. Factors such as perceived usefulness, ease of use, and the alignment of

technology with professional roles and responsibilities can either promote or hinder technology adoption <sup>5</sup>.

Organizational factors, such as the availability of clear policies and guidelines, the provision of adequate training and support, and the allocation of necessary resources, have also been identified as critical determinants of technology acceptance among healthcare professionals <sup>6</sup>. The organizational culture and leadership support can either foster or inhibit the successful integration of technology within the healthcare system <sup>7</sup>.

Environmental factors, including cultural norms, societal attitudes, and regulatory frameworks, can also shape the acceptance and utilization of technology in healthcare settings. Contextual factors specific to the Saudi Arabian healthcare system, such as cultural beliefs, gender dynamics, and the influence of religious and traditional practices, may also play a significant role in technology adoption <sup>7</sup>.

This study aimed to explore the prevailing attitudes, perceptions, barriers, and facilitators influencing the acceptance and utilization of modern technology among healthcare professionals at the King Salman Armed Forces Hospital (KSAFH) in Tabuk, Saudi Arabia. By addressing this research objective, the study provides valuable insights that can inform the development of targeted strategies and interventions to optimize technology integration and enhance patient care delivery within the healthcare system.

## SUBJECTS AND METHODS

This study employed a quantitative research design, utilizing a cross-sectional survey to investigate the factors influencing the acceptance and utilization of modern technology among healthcare professionals at the King Salman Armed Forces Hospital (KSAFH) in Tabuk, Saudi Arabia.

### Participants and Sampling

The study population consisted of all doctors and nurses currently working at KSAFH. Using Yamane's formula to calculate the sample size, the researchers aimed to survey 305 respondents to ensure an adequately sized sample that would be representative of the healthcare professionals at the hospital.

### Research Instrument

A carefully designed Likert-scale questionnaire was developed as the research instrument for this study. The questionnaire was based on four conceptual areas: perceived usefulness, ease of use, organizational support, and individual factors. Prior to the main data collection, a pilot study was conducted with 20 healthcare professionals (10 nurses and 10 physicians) from KSAFH to assess the clarity, relevance, and reliability of the questionnaire.

### Data Collection and Analysis

The finalized questionnaire was distributed to the healthcare professionals at KSAFH through an online platform (Google Forms).

The data collected from the survey were analyzed using SPSS software for descriptive and inferential statistics. Descriptive statistics, including means, standard deviation (SD), frequencies, and percentages, were used to summarize the survey responses and provide an overview of the participants' characteristics and perceptions.

### Ethical Considerations

The study obtained the necessary approval from the King Salman Armed Forces Hospital's Research Ethics Committee prior to data collection. Participants were informed about the voluntary nature of their participation and the confidentiality of their responses. Appropriate measures were taken to ensure the protection of participants' privacy and the ethical conduct of the research. This work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

## RESULTS

### Participant Characteristics

A total of 308 healthcare professionals took part in the study, with 256 of them being expatriates and 52 being Saudi nationals. Among the participants, 47 were doctors and 261 were nurses. The majority of the participants (53.2%) reported a "good" level of computer literacy, while 19.8% and 25.6% were classified as having "very good" and "medium" levels

of computer literacy, respectively. Only a small percentage (1.3%) indicated a "weak" level of computer literacy.

### Facilitators of Technology Adoption

The study identified several key facilitators that contributed to the successful adoption and integration of modern technology among healthcare professionals at KSAFH. These facilitators included: The availability of clear organizational policies and guidelines regarding the use of technology in healthcare (mean = 4.02, SD = 0.96). The perception that technology would enable healthcare professionals to accomplish tasks more quickly and efficiently (mean = 4.14, SD = 0.93). The belief that technology would increase productivity (mean = 4.15, SD = 0.90) and effectiveness (mean = 4.19, SD = 0.90) in their job. The perception that technology is useful in their job (mean = 4.25, SD = 0.90). The belief that having access to technology would enhance the quality of healthcare services (mean = 4.22, SD = 0.92).

### Barriers to Technology Adoption

The study also revealed several barriers that impeded the acceptance and utilization of modern technology among healthcare professionals at KSAFH. These barriers included: Inadequate training and education on the use of technology (mean = 3.98, SD = 1.01). Lack of organizational support and resources for technology integration (mean = 3.92, SD = 1.00). Concerns about the reliability and security of technology (mean = 3.87, SD = 1.03). Resistance to change and reluctance to adopt new technologies (mean = 3.84, SD = 1.04). Cultural factors, such as gender dynamics and traditional practices, that influenced technology acceptance (mean = 3.79, SD = 1.08) (Figure 1).

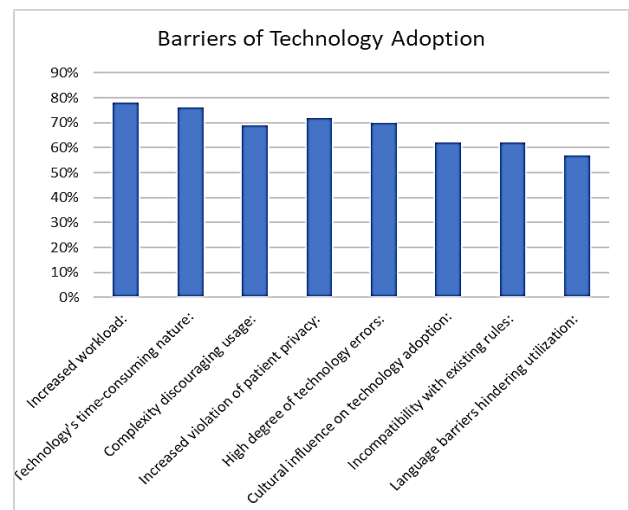


Figure 1

## DISCUSSION

The findings of this study provide valuable insights into the factors that influence the acceptance and utilization of modern technology among healthcare professionals at the King Salman Armed Forces Hospital in Tabuk, Saudi Arabia. The results

highlight the importance of addressing both facilitators and barriers to optimize technology integration and enhance patient care delivery within the healthcare system.

The positive attitudes and perceptions of healthcare professionals towards technology adoption, as evidenced by the high ratings on perceived usefulness, ease of use, and productivity enhancement, suggest a general openness and willingness to embrace technological innovations. This aligns with the existing literature, which emphasizes the critical role of individual factors in shaping technology acceptance<sup>6</sup>.

However, the study also identified several barriers that impede the successful integration of technology, including inadequate training and education, lack of organizational support, concerns about reliability and security, resistance to change, and cultural factors specific to the Saudi Arabian context. These findings are consistent with the existing literature, which highlights the multifaceted nature of technology adoption in healthcare settings<sup>6</sup>.

The identification of clear organizational policies and guidelines as a key facilitator underscores the importance of establishing a supportive and enabling environment for technology integration. This aligns with the literature emphasizing the crucial role of organizational factors in promoting technology acceptance among healthcare professionals

The study's findings have several implications for healthcare organizations and policymakers. Firstly, the results suggest the need for comprehensive training and education programs to equip healthcare professionals with the necessary skills and knowledge to effectively utilize modern technologies. Secondly, the findings highlight the importance of developing clear organizational policies and guidelines that provide a framework for the integration of technology, addressing concerns about reliability, security, and cultural factors.

Furthermore, the study emphasizes the need for healthcare organizations to allocate adequate resources and provide strong organizational support for technology integration. This includes investing in infrastructure, Information Technology (IT) support, and change management initiatives to facilitate the seamless adoption of modern technologies.

## CONCLUSION

This study provides valuable insights into the factors influencing the acceptance and utilization of modern technology among healthcare professionals at the King Salman Armed Forces Hospital in Tabuk, Saudi Arabia. The findings reveal a generally positive attitude towards technology adoption, with healthcare professionals recognizing the potential benefits in terms of improved productivity, efficiency, and effectiveness. However, the study also identified several barriers, including inadequate training and

education, lack of organizational support, and cultural factors, that impede the successful integration of technology.

To optimize technology adoption and enhance patient care delivery, healthcare organizations should focus on addressing these barriers through comprehensive training programs, the development of clear organizational policies and guidelines, and the provision of strong organizational support and resources. By fostering a culture of innovation and addressing the multifaceted factors that influence technology acceptance, healthcare organizations can leverage the power of modern technology to improve patient outcomes and drive positive change within the healthcare system.

The findings of this study contribute to the broader body of knowledge on technology acceptance in the healthcare sector, informing future research and policy initiatives in this domain. Further research, including longitudinal studies, comparative analyses, and intervention studies, can provide additional insights and strategies to support the successful integration of modern technology in healthcare settings.

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