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Bridging the Digital Gap: A Qualitative Case Study on Technology Access and Job Efficiency among Female Healthcare Providers in Afghanistan

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ABSTRACT

This study aimed to explore the experience of female healthcare providers in accessing and using digital technology, the key factors that contribute to their adoption of technology, and its impacts on their job efficiency and professional growth of female healthcare providers in Kabul, Afghanistan. To fulfill the objectives of this study, the author employed a qualitative method, including a thematic analysis of semi-structured interviews with 10 participants from both public and private hospitals in Kabul. A case study approach was used to explore the opportunities and obstacles female employees face while using digital and non-digital medical technology. The respondents included nurses, midwives, and physicians with different levels of experience. The result showed that several main factors interact with employee's digital literacy, including educational background, experience, income, infrastructure and gender-based restrictions that eventually impact job efficiency and professional development. While the study does not try to generalize the experience of all Afghan female healthcare providers, it identifies the important areas for support and assistance. This study provides helpful information for policymakers, healthcare institutions, and international organizations who aim to enhance digital literacy among women in fragile and low-income settings.

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Introduction

According to the World Health Organization (WHO), women contribute to almost 70% of health and social care, which makes them essential to the global health system. Their contribution is significant in providing health care services, especially in fields such as midwifery, nursing, and primary care (WHO, 2020). Empowering women with sufficient resources, including digital health literacy, enables them to perform more efficiently. Digital technology is changing the global healthcare sector and indicating how healthcare professionals perform their responsibilities and provide services. Electronic healthcare records, telemedicine, and mobile health applications are a few examples of how technology is increasing productivity and job efficiency and improving patient care results. For health workers, specifically in environments with limited resources, these technologies improve productivity by enhancing clinical decision-making and facilitating remote consultation and documentation (Agarwal et al., 2016; WHO, 2021). Access to and sufficient use of technology are associated with job satisfaction and patient outcomes, which emphasizes the necessity of broad digital sources in the healthcare system. However, employees, especially women, do not benefit equally from digital tools across all regions. In low- and middle-income countries, problems such as insufficient facilities, lack of proper training, and gender inequality often restrict healthcare employees from fully using digital devices. Afghanistan is one of these countries where employees face numerous problems and challenges (Nazari and Musilek, 2023). In many regions, girls and women continue to encounter many challenges in accessing and engaging with digital technology. As UNICEF noted:

> "Girls and young women are less likely across the region to choose careers in technology, including STEM (science, technology, engineering and mathematics), because they are deemed as a 'men's job' or 'too hard'." (UNICEF, 2023)

This attitude not only restricts their access to digital tools but also affects their career choices, which are necessary for both professional and personal growth. In Afghanistan, where cultural and structural issues have already restricted women from participation, bridging the digital gap has become even more critical. Female healthcare professionals play an essential role in providing medical services, especially regarding women and children in Afghanistan. However, their efficiency is often constrained by limited access to insufficient resources, such as inadequate training, lack of digital literacy, and social and

gender-based challenges (Tahera, 2023; Yar, F. G. M. 2024). This study aims to explore the experience and how access and the use of technology impact the job efficiency of female healthcare providers in Afghanistan. Examining the advantages and barriers that female healthcare providers experienced at their work. By examining this dynamic through a qualitative case study based on interviews, this study tends to clarify practical implications for healthcare services, employment growth, and gender equality in the use of technology and digital health.

Statement of the Problem

In Afghanistan, Female healthcare providers play a significant role in delivering healthcare services under difficult situations. However, their job efficiency and professional growth are still affected by limited access to digital technology and proper training and support. Even though accessing and adopting different kinds of technologies have become more essential worldwide, there is a lack of context-specific studies to discover how these women experience and adopt technology in their workplace. The lack of study on this problem limits efforts to develop supportive policies that increase job satisfaction and digital access among Afghan female healthcare providers. Without understanding these problems and needs, it is difficult to provide practical solutions that empower them to level up their digital literacy and improve patient care.

Objective of the Study

- To explore the experience of female healthcare providers in accessing and using digital technology.
- To identify what factors contribute to their adoption of digital technology.
- To explore how the use of digital technology impacts their job efficiency and professional growth.

Literature Review

According to recent research, healthcare professionals have high levels of digital health literacy, with specific abilities in information-seeking, privacy protection, and navigational skills (Alipour and Payandeh, 2022). While results in areas like content creation and information reliability evaluation presented slightly lower scores, the overall proficiency remained important. Also, it was discovered that employee roles and educational backgrounds have a significant impact on these competencies, showing the importance of demographic and contextual factors in learning digital skills. Digital literacy among

healthcare providers shows significant differences across different nations. Another study shows that only 51.8% of healthcare employees had adequate digital literacy, influenced by elements such as higher education, positive attitude, and technological accessibility. The authors suggest enhancing computer accessibility, training programs, and promoting positive perception could improve health information systems (Tegegne et al., 2023). Therefore, to fully discover how technologies impact female healthcare providers' job efficiency Rajeswari et al., (2021) found how female healthcare professionals engage with digital tools at the workplace and showed that they frequently used a range of ICT tools. Most of them demonstrated a high level of digital proficiency. Significantly, 90 % of them agreed that ICT significantly improved their overall job performance and the efficiency and speed of their medical tasks. Alharoon and Aldhmour (2025) examined how digital health technology and its adoption influence the work-life balance of female physicians. The result showed that while digital technologies help early-career female doctors maintain their work-life balance, those who are in the mid to late career stages may face challenges, maybe because of greater administrative duties and changing career responsibilities. It shows that both career stage and access to support system are valuable for evaluating how technology impacts the job efficiency of female healthcare providers. Therefore, Shiferaw et al., (2020) described digital competency among healthcare providers in low-income countries, and the result of their study showed that healthcare providers had low digital skills and often encountered challenges in communication and problem-solving, which are important for doing their tasks efficiently. It also described gender disparities as a significant factor that impacted digital skills. Other factors such as income, educational background, and work experience contribute to how confident employees are in using technology. As Eugenio Santoro stated, some important factors contribute to digital literacy:

> Digital literacy is important for reducing gander disparities in healthcare system, particularly for female doctors. Digital tool proficiency improves professional development, improve access to medical information, and enhances patient care. Digital literacy enables women specially in limited resource settings to overcome obstacles and deliver high quality care (Santoro 2025).

In the current scenario, technology helps women to be more productive in their work environment and digital literacy and the adoption of new technology increase various opportunities for them. In general,

studies in Afghanistan showed that despite challenges, information and communication technology (ICT) offers an essential opportunity for women to improve status rights, gain jobs, and participate more fully in society (Hakimi et al., 2024). Nabizada and her colleagues surveyed 150 women to explore the perception of Afghan women regarding technology access and empowerment. Their study revealed that social and cultural restrictions make it hard for Afghan women to use technology. Despite some progress, limited access to digital literacy and infrastructure resources prevents women from getting job opportunities and education (Nabizada et al., 2024). The integration of digital tools has been critical in improving maternal care in resource-limited environments like Afghanistan. The United Nations Fund for Population Activities (UNFPA) has established a midwifery helpline in Afghanistan. This helpline supports midwives who are working in remote areas and provides them with timely medical advice on controlling and managing obstetric emergencies. This program is essential to enhance the standard of care, gives midwives access to real-time professional advice and improves their capacity to handle urgent situations (UNFPA, 2024).

Research Methodology

A qualitative case study design was adapted to find out the experience of female healthcare providers in Kabul, Afghanistan, related to their access to technology and how it impacts their job efficiency. This study involves ten individual case studies of healthcare providers, such as physicians, nurses and midwives, who were more exposed to technology and working in private and public hospitals across Kabul province. This study aims to explore the real-life challenges and advantages of digital technology use in the workplace from their point of view. The case study approach allows a comprehensive and contextual analysis of participants' life experiences. Researchers can analyze similarities and differences across multiple case studies, which helps them to have a deeper understanding of common themes and distinctive patterns (Baxter and Jack 2008).

Convenience sampling was used to select participants who had relevant experience regarding the use of technology and its influence on their jobs. The participants were selected based on their willingness to participate in the interview. The researcher conducted an in-depth semi-structured interview through online platforms. Before interviews, participants received consent information about the purpose of the research, ethical protection and their rights as participants. A fixable outline was used for each interview, which allowed participants to express their opinions while ensuring that the main subjects of the interview were covered. Each interview lasted between 25 to 45 minutes, and permission was

obtained to record their voices, which were then transcribed for analysis. All 10 interviews were conducted according to the participants' preferred leisure time. They were asked a list of open-ended questions to understand and discover their opinion about how technology affects their tasks. The participants shared their demographic information, their experiences with access and adoption of types of technology and the challenges they faced. After the interview, the researcher processed the information, and the data was resent to the participant for clarification to ensure accuracy. For the analysis of collected data, the researcher used thematic analysis, which follows the six-step approach by (Braun and Clarke, 2006), to identify common patterns and unique individual insights into how technology influences job efficiency. The questions of the interviews were developed based on the objective of the study, literature reviews and professional judgment. This method is commonly used in qualitative research because it helps the authors formulate questions that are relevant to the context and objectives of the study (Creswell and Poth, 2016).

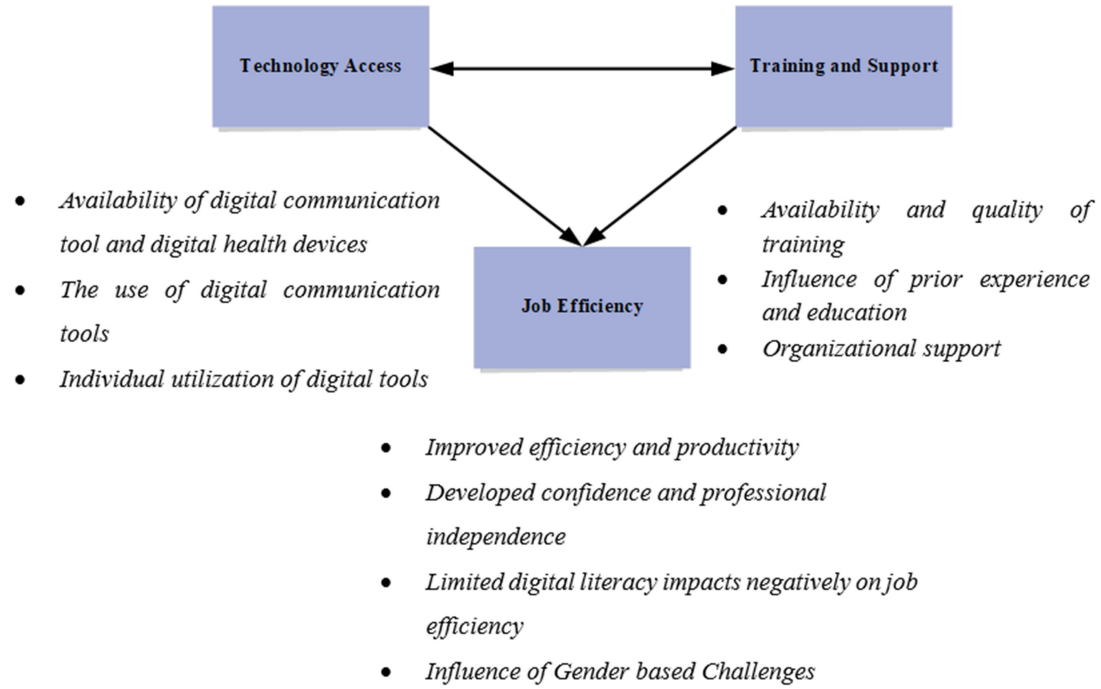
Analysis of Data

Demographic information

A total of 10 interviews were conducted for this study, all of which focused on the theme of technology access and job efficiency among female healthcare providers in Kabul province, Afghanistan. All the participants were women aged between 25 to 34 years. In terms of profession, there were midwives, nurses, and physicians. The work experience of participants ranged between 1 to 10 years in the healthcare sector. With respect to their workplace setting, participants were employed in public and private hospitals. All participants had at least one bachelor's degree education and regular contact with technology in their workplace.

Three main themes were explored throughout the analysis of interviews conducted among 10 participants. The following figure displays a visual summary of these themes and their corresponding subthemes. These emerged through a thematic analysis of participant responses and show the key patterns and insights related to their experience.

Figure 1. The main themes and subthemes



Source: *compiled by author*

Theme 1. Technology Access

Three subthemes were developed for the interviews regarding access to technology and their purpose: Availability of digital communication tools and digital health devices, the use of digital communication tools, and individual utilization of digital tools. Technology was viewed as an important part of their daily operations, providing care delivery and acquisition of knowledge.

Availability of digital communication tools and digital health devices

Participants stated that they have access to digital communication tools and digital health devices across both public and private health settings. These devices included online platforms and IT tools, including computers and mobile phones, that were used for patient care, data entry and communication, and diagnostic and therapeutic devices, including electronic health records, digital monitors and simple clinical equipment with digital capabilities. In public hospitals, most of these devices were supplied by international organizations such as the World Health Organization (WHO) and reported to be regularly maintained. Some respondents who were employed in private hospitals mentioned that they also have access to more updated and advanced technology, which the hospital provides.

> *"In the hospital where I work, there are digital health devices and other useful IT tools for monitoring, recording, care delivery, and recording patient data. Organizations such as WHO and other agencies, which ensures their proper maintenance." (Participants- 1, 10)*

Therefore, respondents expressed that using computers and digital data entry has improved their work compared to traditional paper-based methods. According to them, data entry is faster and reduces errors such as illegible handwriting and missing documentation.

The use of digital communication tools

According to some respondents, digital communication tools are used particularly for consultation and follow-ups. With the use of video calls and mobile phones, these services help healthcare providers to provide consultations with patients in remote areas without having to meet them in person. These services reduce patient overload in the hospital.

> *"Sometimes I use a mobile phone to have a conversation with the patient through video call or phone. But still problems are there, not all patients have access to smartphones or stable internet, so most of them prefer to come in person. (Participants- 8, 5, 7)*

Respondents reported that sufficient infrastructure boosts their confidence in doing their job effectively. Since connectivity and power shortages are a big issue in Afghanistan, respondents mentioned that when both doctors and patients have proper access to the internet, they can communicate smoothly with each other. It reduces patient flow in the hospital and allows employees in the hospital to pay more attention to essential tasks.

Individual utilization of digital tools

Every respondent has their own experience of using technology for clinical practice, online communication and consultation with their colleagues and patients. They mentioned they use technologies frequently, and the efficient use of health technologies is heavily dependent on individual knowledge and experience. They considered themselves semi-skilled in using the Internet and IT office applications.

Theme 2. Training Related to Digital Technology

This theme explored the level and nature of training and support provided to healthcare providers in both private and public health facilities. There are three subthemes identified regarding this theme: availability and quality of training, the impact of prior education, and organizational support.

Availability and quality of training

Respondents' views related to availability and training showed differences in public and private health settings. Respondents who were employed in private hospitals reported that they received training regularly about how to use technology, especially digital health devices, from the bio-medical engineering team. This qualified training helped them to be more prepared to use technologies in their workplace.

> *"I had training on every device when I started working at this hospital, and our seniors help us to use them until we feel confident". (Participant-8)*

However, some employees from public hospitals shared that they did not receive regular and formal training when they first joined. One of them mentioned that she had to independently seek opportunities to learn digital machines in private clinics to gain hands-on experience in using digital devices and online-based platforms to learn more. This self-initiated learning often comes at a personal financial cost.

> *"I was rejected so many times when I applied for a job in several hospitals because of a lack of work experience. Eventually when I got a job in a hospital, I realized that I did not have enough knowledge about using digital health device, for example, a cardiography machine, and I used to refer to my seniors for help frequently, so it made me feel less confident somehow. Finally, I left that job and paid to join a private hospital to learn more about digital health machines. In the current hospital where I work, they provided training when I joined, but I felt like it was not enough. Thankfully that time I spent time to enhance my education. Now I feel confident about how to use these devices, and thanks in part to Chat GPT, which provides me more information." (Participant- 3)*

Influence of prior experience and education

Many respondents mentioned that their university education was mostly theoretical and did not provide them with enough practical education regarding how to manage and use digital devices. This gap often required them to learn the machines by paying. Some claimed that if there were proper practical training in technology, even artificial intelligence, during university, they would not face many challenges.

> *"The institute I graduated from did not have enough proper updated technology, especially digital health technologies. Some devices were there but they were outdated. Also, when I went for my piratical sessions in other hospitals, I did not do enough practical work because employees were often too busy to teach me, and since I was a new learner and inexperienced, I was not confident to use diagnostic machines to treat a patient." (Participant-4)*

Organizational support

Respondents acknowledged different degrees of organizational support. Some of them described stronger organizational support, while others claimed that these supports were limited or inconsistent. Access to monitorship, supervision, and follow-up training was described as minimal. They stated that healthcare institutions should provide better and more reliable help. They argued while there is some support existing in hospitals, regular and consistent training and monitoring on the use of digital technology is lacking. Participants emphasized that to perform more accurately, healthcare institutions should provide online digital communications tools that are more reliable and part of their job. Some participants often use their mobile data to use online platforms such as AI tools and medical websites, which adds to their financial burden.

They suggested that the hospitals should provide free or subsidized Wi-Fi. Additionally, they mentioned that their motivation and satisfaction rise when their effort is recognized, particularly when it comes to learning about digital technologies, which are somehow difficult for females to learn.

Theme 4. Impact of Technology Utilization on Job Efficiency

For understanding the impact of technology on job efficiency and performance of employees, three main subthemes were explored: Improved efficiency and productivity, developed confidence and professional independence, limited digital literacy has a negative impact on job efficiency, and the influence of gender-based challenges.

Improved job efficiency and productivity

Respondents reported that the use of technology, digital tools and online platforms significantly improved their job efficiency and productivity. It was also found that digital literacy is very important and helps healthcare providers to complete their tasks quickly.

> *"I use AI a lot and it helped to progress in my job. Earlier I was struggling to find information from other resources which was time consuming for me. Now I feel like I get*

> *more information about every aspect of my job especially about operating a digital health machine, and I feel more creative. I presented many presentations regarding how to use digital health devices, and I got good feedback from seniors.". (Participant- 5,8)*

Developed confidence and professional independence

According to those respondents who had regular training, technology has boosted their confidence as they get more familiar with digital technologies. It makes them make decisions independently, provide timely care for patients, and rely less on others.

> *"I feel more confident teaching others when it comes to digital health devices. Before I used to ask young people especially men to help me how operate a machine. After getting more experience and knowledge I rarely rely on others." (Participant- 1,8)*

Limited digital literacy has a negative impact on job efficiency

It was found that limited digital literacy is a significant barrier to job performance among female healthcare workers. Despite having access to sufficient digital tools, many respondents reported that the lack of proper education and practical experience hindered their ability to use these devices efficiently.

> ***"****Access to technology alone is not enough. Sometimes I feel like even I have 10 years of work experience I still do not know how to fully use some technology. Because I am afraid of making mistakes or damaging them****.*** *I lacked confidence, and it somehow demotivated me." (Participant- 7)*

It shows that access alone is not enough. Ongoing support is essential for professional growth and job efficiency.

The influence of gender-based challenges

Several respondents agreed that social restrictions prevent them from advancing in their field. Some of them mentioned that because of certain restrictions from the government have increased stress and limited collaboration with other male doctors. It can negatively affect job efficiency.

> *"There is a restriction from government in regard to treating male and female patients. We are not allowed to treat male patients using physiotherapy machines. And male doctors are not allowed to treat female patients either. Sometimes we are unable to provide proper care, particularly when female employees lack experience. It creates challenges that impact overall patient outcomes.*" *(Participants- 3, 2 ,9 ,4).*

However, Respondents expressed the need for attitude change among healthcare workers and leadership. They emphasized developing a culture of flexibility to learn and removing the fear of making mistakes will boost their confidence and motivation, particularly among less experienced employees. Encouraging and collaborative work among colleagues makes the process of learning easier. Therefore, they mentioned that female healthcare workers should not undervalue themselves. Instead, they should constantly learn more about digital tools and use them online for professional growth.

Discussion

Key Findings

Technology: This study reveals the availability of technology, ranging from online platforms and communication tools to digital health technologies and its effect on job efficiency and career development among female healthcare employees in Afghanistan. It is revealed that having access to these tools improved employees' capacity to deliver better patient care, make informed decisions, and carry out obligations more independently (Begum f., 2022; Bhaskar et al., 2020). However, these advantages are highly correlated to factors such as digital literacy, income, experience, and support of healthcare settings. This result is consistent with broader studies revealing that while technology can fill healthcare gaps, its advantages depend on resources and a supported system (Bello et al., 2004; MacLure and Stewart, 2018; Tegegne et al., 2023).

Training: Digital literacy enables female healthcare providers by enhancing professional growth, optimizing healthcare delivery, and reducing gender disparities. However, these positive influences are highly dependent on educational background and the quality and frequency of training that employees receive (Parlakkilic and Saribas, 2021). Those with regular training and an encouraging environment were better at implementing technology. In contrast, employees with less practical work and insufficient training expressed misusing it, which led them to rely more on colleagues and lose confidence. These results are aligned with literature that shows the effective use of technology has been impacted by training, capacity building and organizational support. Effective training on digital literacy enhances employees' work autonomy and quality of care (Do Nascimento et al., 2023; Yar, F. G. M. 2024). When employees learn digital technology, especially digital health technologies, informally at work, their performance and skills are unlikely to develop.

Technology and job efficiency: it has been shown that the use of technology in healthcare settings influences the job efficiency of female healthcare providers in several ways. While employees expressed themselves as semi-skilled at using digital technologies, it is found that being experienced and having proper access to IT tools, online platforms and digital health machines improve productivity and enable them to make clinical decisions and complete their tasks more efficiently, and evidence shows that digital literacy has a positive impact on health workers task performance (Barakah et al., 2015; WHO, 2023). However, employees with limited digital literacy or little prior training struggled with a lack of confidence in using technologies, which resulted in less productivity. Gender-based challenges, limited infrastructure, and cultural restrictions also impact female healthcare providers to gain experience and technological competence in Afghanistan (Najafizada et al., 2019; Parray et al., 2021; Zaidi et al., 2020).

Challenges and limitations

The study emphasized a context-specific issue: the experience of Afghan female healthcare workers using technology in their work environment. By employing qualitative interviews, this study gathered detailed and in-depth perspectives regarding the impact of technology on the job efficiency of employees. The inclusion of participants from both private and public health settings reflects the obstacles and opportunities these workers face. The research also provides insight into how financial, cultural and gander-based challenges interact with access to technology and digital literacy, which deepens the overall analysis. However, this research has some limitations. The sample size was relatively small, and the participants were selected through convenience sampling, which may limit the generalizability of the findings. Interviews have relied on self-reported experience, which may have a bias or selective remembering. Therefore, the study was limited to a single geographic area and did not include the male viewpoints, which could have provided a broader institutional context. In contrast, this research gives useful information for comprehending how female healthcare providers interact with technology in restricted environments and what structural changes can promote their development and effectiveness (Creswell, 2014).

Relevance to national and global healthcare supporter practice

The result of this research provides information to national and international healthcare supporters, such as hospital administration, the Ministry of Public Health, WHO, UNICEF, and other health policymakers, regarding requirements and issues faced by female healthcare workers in Afghanistan. Despite challenges, female healthcare providers continued to serve their communities in limited

resources and restricted environments. As WHO noted, Afghan women in healthcare have shown incredible resilience to carry out their responsibilities effectively, yet they need access to education and support to fulfill their jobs (WHO, 2023). The availability of supported infrastructure and policy is closely related to a significant increase in job efficiency and professional growth. Policy and funding mechanisms must be developed to bridge digital and gender barriers, ensuring that Afghan healthcare employees are not left behind in the evolving landscape of healthcare delivery.

Conclusion

According to this research, access to technology is important in improving self-reliance, confidence and job satisfaction among female healthcare providers. However, obstacles such as low digital literacy, inadequate infrastructure, and social and cultural restrictions prevent them from being confident in using technology. Resolving these problems is important in enhancing the quality of care, job efficiency and development of the work environment.

Further Research

Further studies should focus on the long-term impact of digital literacy and mentorship on professional advancement in healthcare settings. Comparative studies involving different regions could bring broader insights into this issue. Moreover, quantitative research could measure the effect of technology on health institutions' outcomes and job satisfaction of female healthcare providers.

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