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Title in English

**The Impact of E-learning on Health Sector Worker Skills Development: Applied
study in Taif, Saudi Arabia**

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Abstract

This study investigates the impact of e-learning on healthcare worker skills development in Taif, Saudi Arabia. With the growing adoption of digital learning methods in the healthcare sector, understanding their effectiveness in skill enhancement is essential, especially in regions where traditional learning methods have predominated. The research focused on healthcare professionals working in Taif, utilizing a quantitative survey and qualitative open-ended questions to gather insights into their experiences with e-learning. The study aimed to evaluate the extent to which e-learning contributes to professional development, identify the benefits and challenges faced by healthcare workers, and explore variations in perceptions based on demographic factors such as gender, age, and work specialty.

A total of 300 valid responses were collected, representing a response rate that aligns closely with the initially determined sample size. The sample consisted of 55% males and 45% females, with a diverse age distribution and a majority representation of clinical health practitioners. The statistical analysis revealed several key findings: e-learning was widely perceived as beneficial, with the majority of respondents agreeing that it enhances learning, improves job effectiveness, and supports skill development. Specifically, 83% of participants found that e-learning contributed positively to their learning process, while over 74% indicated that it improved their job performance and productivity.

The qualitative analysis of open-ended responses highlighted several recurring themes related to the benefits and challenges of e-learning. Key advantages included the flexibility of scheduling, the ability to learn at one's own pace, and the convenience of accessing learning resources without the need for physical relocation. On the other hand, challenges such as language barriers, inadequate digital infrastructure, and the lack of

interactive elements were frequently mentioned. Many respondents expressed concerns about the limited opportunities for practical training and real-time interaction, which they believe are crucial for healthcare education. The study also found that perceptions of e-learning varied across different demographic groups, with male participants reporting a slightly higher positive impact on productivity compared to their female counterparts. Additionally, significant differences were observed between clinical and non-clinical practitioners regarding the perceived impact of e-learning on learning outcomes and attitudes.

Overall, the study concludes that while e-learning is a valuable tool for healthcare worker development in Taif, certain areas require improvement to maximize its effectiveness. Recommendations include enhancing digital infrastructure, offering bilingual content, incorporating interactive and practical components, and providing more personalized learning options. By addressing these factors, e-learning can be further optimized to support the continuous professional development of healthcare workers, ultimately leading to improved healthcare services in the region.

Keywords: E-learning, Healthcare professionals, Professional development, Skills enhancement, Taif, Saudi Arabia.

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Chapter 1

Introduction

Introduction:

In recent years, technological advancements have dramatically reshaped the landscape of healthcare education. Among these innovations, e-learning has emerged as a pivotal tool, transforming the traditional approaches to continuous professional development and skills enhancement. The integration of digital learning platforms offers flexibility and accessibility, making it possible for healthcare professionals to pursue specialized training without the constraints of time and location (Ardestani et al., 2023). This is particularly relevant in regions where access to traditional educational resources is limited, as is the case in Taif, Saudi Arabia. Despite its significance as a regional hub, Taif lacks the comprehensive healthcare education programs found in major cities like Riyadh or Jeddah. This geographical limitation poses challenges for healthcare professionals in the region, who must seek alternative avenues to advance their expertise and keep pace with rapidly evolving medical knowledge.

E-learning presents a viable solution to this challenge, offering healthcare workers in Taif the opportunity to engage in continuous education while maintaining their professional responsibilities. The flexibility of e-learning allows for personalized learning experiences, catering to individual schedules and learning preferences. Additionally, it enables healthcare professionals to access a broader range of specialized content, which might otherwise be unavailable locally. As healthcare systems increasingly prioritize the continuous development of their workforce, understanding the effectiveness of e-learning in enhancing job-related skills becomes crucial, particularly in contexts where traditional educational opportunities are constrained.

The significance of this study lies in its focus on Taif, a city that exemplifies the educational disparities faced by healthcare workers in many non-metropolitan areas. By examining the role of e-learning in this specific context, this research addresses a gap in the

literature regarding how digital learning platforms impact skill development in under-resourced regions. The investigation centers on three primary dimensions: awareness of job-related information, job effectiveness, and productivity. These dimensions are critical indicators of professional competence and have direct implications for the quality of healthcare services delivered in the region.

To structure the analysis, this study employs the IS-Impact Measurement Model, which has been widely recognized for its robustness in evaluating information systems' effectiveness (Alkhalaf et al., 2012). The model's focus on the impacts of e-learning aligns well with the research objectives, allowing for a comprehensive assessment of how digital learning platforms contribute to healthcare workers' professional growth. The insights derived from this analysis are expected to inform educational strategies that address the unique needs of healthcare professionals in Taif, where access to traditional education is limited.

Previous studies have explored the benefits and challenges of e-learning in various contexts, but limited research has specifically focused on its application within healthcare settings in Taif. This research aims to bridge that gap by providing empirical evidence on how e-learning influences the skills development of healthcare workers in such regions. Furthermore, by examining both the positive impacts and the challenges associated with e-learning, this study offers a balanced perspective that can guide future policy and decision-making in healthcare education.

In addition to evaluating the direct outcomes of e-learning, this research also considers the broader implications of digital education on the healthcare workforce in Taif. As the demand for specialized healthcare services grows, there is an increasing need for professionals who can adapt to new technologies and practices. E-learning not only

facilitates this adaptability but also supports a culture of lifelong learning, which is essential for maintaining high standards of care. By equipping healthcare workers with the skills they need to excel in their roles, e-learning has the potential to enhance overall healthcare delivery in the region.

Ultimately, this research seeks to contribute to a deeper understanding of how e-learning can be optimized as a tool for professional development in healthcare. The findings aim to support the development of targeted educational initiatives that are both accessible and effective, particularly for healthcare workers in regions with limited traditional educational resources. As digital learning continues to evolve, the insights gained from this study could have far-reaching implications for healthcare education in similar contexts globally.

Study Problem:

Healthcare professionals in Taif, Saudi Arabia, face unique challenges in accessing continuous professional development due to the city's geographical location and the concentration of major universities with comprehensive health specializations in the main cities like Riyadh, Jeddah, and Dammam. Consequently, healthcare workers in Taif have limited opportunities to pursue further education and training without traveling to these major cities. E-learning presents a potential solution by offering flexible and accessible training options. However, it is crucial to investigate the effectiveness of e-learning from the perspective of healthcare professionals in Taif.

This research aims to assess how well e-learning meets their needs and improves their skills, considering the specific context of Taif where traditional in-person educational opportunities are scarce. By focusing on the perceptions and experiences of healthcare workers in Taif, this study seeks to provide insights into the viability and impact of e-learning as a tool for professional development in this region.

The importance of the study:

The importance of this study lies in its focus on the effectiveness of e-learning for healthcare professionals in Taif, Saudi Arabia, a region where traditional educational opportunities are limited due to geographical constraints. Unlike the major cities of Riyadh, Jeddah, and Dammam, Taif lacks access to universities offering comprehensive health specializations, compelling healthcare workers to travel for professional development. This study addresses a significant gap in the literature by evaluating how e-learning can serve as a viable alternative for continuous professional development in such contexts.

Previous studies have highlighted the general benefits of e-learning in healthcare, noting improvements in knowledge, skills, and performance among healthcare professionals. However, there is a need for localized research that considers the unique challenges faced by healthcare workers in specific regions. By focusing on Taif, this study aims to provide valuable insights into the applicability and effectiveness of e-learning in enhancing the skills of healthcare professionals in areas with limited educational infrastructure. Furthermore, understanding the perceptions and experiences of healthcare workers in Taif regarding e-learning can inform strategies to optimize these educational technologies, ultimately contributing to the broader goal of improving healthcare delivery and outcomes in similar settings.

Objectives of the study:**The objectives of this study are:**

- To assess the impact of e-learning on enhancing awareness and recall of job-related information among healthcare workers in Taif, Saudi Arabia.
- To examine the effectiveness of e-learning in improving the job performance of healthcare workers in Taif.
- To investigate the influence of e-learning on increasing productivity among healthcare workers in Taif.
- To identify the challenges associated with the implementation of e-learning in healthcare settings in Taif.
- To explore the factors influencing the satisfaction levels of healthcare workers with e-learning in Taif.

These objectives will guide the research in systematically evaluating the various dimensions of e-learning's impact on skills development among healthcare workers in Taif, aligning with the overarching goal of enhancing professional development in this sector.

Study questions:**Main Research Question:**

How does e-learning impact the skills development of healthcare workers in Taif, Saudi Arabia?

Subsidiary Questions:

- How does e-learning enhance awareness and recall of job-related information among healthcare workers in Taif?
- To what extent does e-learning improve the effectiveness of healthcare workers in their job roles in Taif?
- How does e-learning contribute to increased productivity among healthcare workers in Taif?
- What are the perceived challenges of implementing e-learning in healthcare settings in Taif?
- What are the factors influencing the satisfaction levels of healthcare workers with e-learning in Taif?

Study Hypothesis:**Null Hypothesis (H0):**

There is no significant impact of e-learning on the skills development of healthcare professionals in Taif, Saudi Arabia, as measured by awareness enhancement, job effectiveness, and productivity improvement.

Alternative Hypothesis (H1):

E-learning significantly enhances awareness and recall of job-related information, improves job effectiveness, and increases productivity among healthcare professionals in Taif, Saudi Arabia.

These hypotheses will be tested through statistical analysis of data collected via the IS-Impact Measurement Model questionnaire, aiming to provide empirical evidence of the effectiveness of e-learning in healthcare professional development in Taif.

Chapter 2:

Literature Review

Introduction:

Healthcare professionals, especially those in rural and remote areas, can utilize technology to advance their professional development. These practitioners are required to complete a specified number of training hours annually to sustain their proficiency and competency. However, accessing continuing professional development remains challenging, particularly for those who face geographical constraints or lack formal enrollment in educational programs. These issues present significant obstacles to traditional teaching methods, making e-learning an essential solution to overcome these barriers (Ardestani et al., 2023).

Rural healthcare professionals can particularly benefit from the flexibility and accessibility offered by online and hybrid continuing education programs. Nonetheless, they often encounter technological challenges, such as inadequate internet access, which can impact their satisfaction and the overall effectiveness of these learning formats (Chaker et al., 2024).

In Saudi Arabia, e-learning adoption in higher education has been growing since 2006, with medical colleges gradually shifting towards computer-based systems (Algahtani et al., 2020). During the COVID-19 pandemic, e-learning became an alternative to conventional education for healthcare students in Saudi Arabia. However, its effectiveness was influenced by psychological stress, technical issues, and lack of experience (Alavudeen et al., 2021).

The impact of e-learning systems on university students in Saudi Arabia, using the IS Success/Impact Measurement framework finding that the implementation of e-learning systems positively influences students' awareness of educational processes, productivity, and overall satisfaction. The majority of students hold a favorable perspective on the functionality and effectiveness of these e-learning systems (Alkhalaf et al., 2012).

E-learning has revolutionized healthcare education by offering training and development opportunities to healthcare professionals, irrespective of their geographical location (Ardestani et al., 2023). Online and hybrid continuing education programs for healthcare professionals result in substantial enhancements in their knowledge, skills, performance, confidence, self-efficacy, satisfaction, and attitudes, and provides more accessibility compared to traditional in-person settings (Chaker et al., 2024).

Key factors affecting e-learning success in healthcare include satisfaction, availability, effectiveness, readability, and engagement (Ardestani et al., 2023). Despite challenges, e-learning offers benefits such as increased accessibility, interactivity, flexibility, and cost efficiency for healthcare professionals' development.

Previous studies and theoretical framework:

E-learning:

The traditional model of education, characterized by face-to-face interaction between teachers and students in a physical classroom, has been the norm for centuries. However, with the advent of technology, this conventional setup is progressively being replaced by e-learning, a mode of education where participants are separated by time, place, or both, and communication is mediated through technological means, most notably the internet. According to Stockley (2003), e-learning refers to the delivery of educational programs by electronic means, involving the use of computers or electronic devices, such as mobile phones, to provide training or educational content. This broad definition encompasses both online and offline methods, including the use of CD-ROMs and DVDs, although the internet remains a primary medium for e-learning delivery.

E-learning is typically categorized into two main types: synchronous and asynchronous. Synchronous e-learning involves real-time interaction between instructors and students, facilitated through instant messaging, video conferencing, or other real-time communication tools. Conversely, asynchronous e-learning allows learners to access course materials and communicate with instructors at their own pace, using tools like email. Both types use various teaching methods, whether from non-interactive tools such as lessons and lectures in document and video format, or interactive tools that include a platform for online chat and discussion. (Hrastinski, 2008; Vander Ploeg, 2012)

E-learning has been increasingly recognized as a powerful tool for enhancing education, especially in the context of rapid technological advancements. It enables users to exchange data remotely and access a wide array of online services and resources, thereby facilitating learning in a flexible and dynamic environment (Hrastinski, 2008). The implementation of e-learning through advanced communication and information technologies has significantly accelerated the development of personalized learning environments, making education more accessible and adaptable to individual needs. Researchers have noted that e-learning represents a fully virtualized model of distance learning, primarily facilitated through the internet, which has become a key medium for both teaching and learning (El-Ghareeb, 2009; Al-Qahtani & Higgins, 2013).

Moreover, e-learning is often seen as a suitable replacement for traditional classroom settings, providing a viable alternative for distance education (El-Ghareeb, 2009). The integration of e-learning into traditional educational models has led to the development of blended learning approaches, which combine face-to-face instruction with online learning activities. This hybrid model not only enhances the effectiveness of education by increasing collaboration between learners and educational programs but also expands access to learning materials and creates more collaborative environments. As such,

blended learning has emerged as a cost-effective and efficient approach, leveraging the strengths of both e-learning and traditional education to improve overall learning outcomes. (Al-Qahtani & Higgins, 2013)

E-learning and Healthcare Professionals:

E-learning has significantly reshaped the landscape of healthcare education by providing healthcare professionals with a flexible and accessible platform for continuous learning and skill development. Unlike traditional face-to-face training, e-learning offers opportunities to access educational resources from any location, enabling healthcare professionals in even the most remote areas to participate in professional development activities. However, despite these advantages, several challenges persist, particularly for those in rural and remote settings. Issues such as limited internet access, geographical isolation, and a shortage of specialized programs and qualified instructors impede the adoption of e-learning in these areas. These challenges necessitate tailored solutions to ensure that healthcare professionals can fully engage with and benefit from e-learning opportunities (Doorenbos et al., 2011).

To better understand the factors that determine the success of e-learning in healthcare, studies have applied methodologies like the Fuzzy Analytic Network Process (Fuzzy ANP) to prioritize critical variables. Key factors such as success, satisfaction, availability, effectiveness, readability, and engagement have been identified, with success emerging as the most influential component. The study's findings highlight that successful e-learning programs are those that are well-designed, accessible, and capable of maintaining high levels of learner satisfaction and engagement. These insights are crucial for the development of future e-learning initiatives that aim to address the specific needs and challenges faced by healthcare professionals in diverse environments (Ardestani et al., 2023).

In addition to accessibility, e-learning offers several other advantages for healthcare professionals, including flexibility in learning schedules and the ability to access up-to-date information in real-time. Studies have consistently shown that e-learning can lead to significant improvements in knowledge, skills, and performance. Healthcare professionals who participate in online continuing education programs often report positive outcomes such as enhanced knowledge retention, improved practical skills, and greater confidence in applying new techniques. These benefits are particularly relevant in the healthcare sector, where staying current with the latest developments and best practices is essential for delivering high-quality care (Chaker et al., 2024).

Despite these positive outcomes, the effectiveness of e-learning is not without limitations. Technological barriers, such as unstable internet connections and lack of access to suitable devices, can hinder the learning experience, particularly in under-resourced settings. Additionally, the absence of direct interaction with instructors and peers can lead to feelings of isolation and a reduction in learner motivation (Cook, 2007). These issues are especially problematic in fully online learning environments, where the lack of social presence can negatively impact learner satisfaction and engagement. To address these concerns, many institutions are adopting blended learning approaches, which combine the advantages of both online and face-to-face instruction (Chaker et al., 2024).

Blended learning has emerged as a particularly effective model for healthcare education, allowing for greater flexibility while still offering the interpersonal interactions that are often missing in fully online courses. In a blended learning environment, healthcare professionals can benefit from the convenience of online learning while still engaging in hands-on practice sessions and real-time discussions with peers and instructors. Research has shown that this approach not only enhances learning outcomes but also increases overall satisfaction by providing a balanced mix of autonomy and support. Blended

learning is especially beneficial for courses that require practical skills training, as it allows for the integration of virtual simulations with in-person clinical practice (Chaker et al., 2024).

While e-learning provides significant benefits, it is important to recognize its potential disadvantages, particularly regarding cost and equity. Developing comprehensive e-learning programs requires substantial investment in technology, infrastructure, and content creation. Moreover, not all healthcare professionals have equal access to the necessary resources, such as reliable internet connections and digital literacy skills (Vaona et al., 2018). This digital divide can lead to disparities in educational opportunities, particularly for those in low-income or rural areas (Doorenbos et al., 2011). Ensuring equitable access to e-learning resources is therefore a critical consideration for healthcare institutions and policymakers aiming to expand the reach of online education skills (Vaona et al., 2018).

The debate between e-learning and traditional face-to-face learning continues, with mixed findings on which approach is more effective. While e-learning offers advantages in terms of flexibility and scalability, studies comparing it with traditional methods indicate that there is little to no difference in learning outcomes, particularly when it comes to knowledge retention and skills application. Some research suggests that traditional methods may be more effective for certain skill-based competencies. This highlights the importance of context in determining the most appropriate learning method; for example, purely cognitive knowledge may be well-suited to e-learning, whereas hands-on skills might require more direct, face-to-face instruction (Vaona et al., 2018).

Another critical aspect of e-learning's impact on healthcare professionals is its influence on self-efficacy and confidence. While many studies report that e-learning

enhances confidence and self-efficacy, these results are not universal. Factors such as the complexity of the technology, the level of support provided, and the learner's initial comfort with digital tools can all affect the outcomes. For e-learning to be truly effective, healthcare professionals must be provided with user-friendly platforms and sufficient technical support. Additionally, fostering a sense of community and providing opportunities for social interaction are crucial for maintaining learner motivation and engagement in online settings (Chaker et al., 2024).

Overall, e-learning has proven to be a valuable tool for the professional development of healthcare workers, offering numerous advantages while also presenting challenges that must be addressed. The flexibility and accessibility of e-learning make it a particularly attractive option for healthcare professionals who need to balance work, education, and personal responsibilities. However, to maximize its effectiveness, it is important to consider the limitations and design programs that are adaptable to various learning contexts. Blended learning, in particular, offers a promising solution by combining the best aspects of both online and traditional education.

Future research should focus on optimizing e-learning environments for healthcare professionals by exploring the integration of emerging technologies such as artificial intelligence, virtual reality, and adaptive learning systems (Ardestani et al., 2023). Additionally, longitudinal studies are needed to assess the long-term effectiveness of e-learning in healthcare education, particularly in relation to sustained knowledge retention and behavioral change (Vaona et al., 2018). By addressing these areas, e-learning can continue to evolve as a critical component of healthcare education, providing professionals with the tools they need to deliver high-quality care in an increasingly digital world.

In this study, the primary focus is on the Individual Impact dimension, a key component of the IS-Impact Measurement Model, as it relates to healthcare workers in Taif, a non-major city in the Kingdom of Saudi Arabia. Taif is located approximately 180 kilometers from Jeddah, the nearest major city offering a comprehensive range of educational specializations in the healthcare field (MOT, 2024). Many healthcare professionals in Taif are required to travel to Jeddah to pursue further education, attend conferences, and participate in training workshops relevant to their field. This travel is often necessary to fulfill the continuous professional development hours mandated by the Saudi Commission for Health Specialties (SCFHS, 2024). Given these challenges, the study aims to evaluate how e-learning can serve as an alternative solution for healthcare workers in Taif, enabling them to access vital educational resources and skill development opportunities without the need for frequent travel.

Theoretical premises of study:

E-learning:

E-learning refers to the use of electronic technologies to deliver educational content and facilitate learning interactions. In this study, e-learning encompasses online and hybrid learning environments aimed at enhancing healthcare professionals' skills development.

IS-Impact Measurement Model:

The IS-Impact Measurement Model, proposed by Gable, Sedera, and Chan, provides a theoretical framework to assess the impact of Information Systems (IS) on various dimensions. This study applies the model's Individual Impact dimension to measure how e-learning influences healthcare professionals' awareness, job effectiveness, and productivity (Gable et al., 2008).

Professional Development:

Professional development refers to the continuous acquisition of skills, knowledge, and competencies that enhance job performance and career growth. In this context, e-learning serves as a tool for ongoing professional development among healthcare professionals in Taif, Saudi Arabia.

These theoretical premises underpin the conceptual framework of the study, guiding the exploration and analysis of e-learning's impact on healthcare worker skills development in the specified context.

Chapter 3:

Research Methodology

Introduction

This chapter provides a detailed account of the systematic approach adopted in this study to investigate the impact of e-learning on the skill development of healthcare workers in Taif, Saudi Arabia. The chapter is structured to present a comprehensive overview of the research design, the characteristics of the study population, and the procedures employed for data collection and analysis.

The chapter begins with a discussion of the Research Design, outlining the overall strategy used to integrate the various components of the study coherently and logically. This section explains the rationale behind the chosen design and how it effectively addresses the research questions. Following this, the Population of the Study is defined, specifying the target group of healthcare professionals in Taif, alongside the Sample Characteristics which provide insights into the demographic and professional profiles of the respondents.

The process of sample size determination is then elaborated, detailing the statistical justifications for the selected sample size and how it ensures the study's findings are representative. The chapter also covers the Data Collection Procedures, describing the tools and techniques used to gather the necessary information, including the administration of online surveys through platforms such as Google Forms.

Study Determinants are discussed to identify the key variables and factors considered in the research, which are critical to understanding the nuances of the study's findings. Finally, the Method of Analysis section outlines the quantitative and qualitative techniques employed to interpret the collected data, including the use of software tools like Excel and SPSS, and manual thematic analysis for open-ended responses. Together, these

sections form a rigorous methodological framework that underpins the reliability and validity of the study's outcomes.

Methodology and research methods:

This study employs a quantitative research approach to investigate the impact of e-learning on healthcare worker skills development in Taif, Saudi Arabia. The research design involves the distribution of a structured questionnaire, based on the IS-Impact Measurement Model (Gable et al., 2008), to healthcare professionals in Taif. The sampling technique will be random, ensuring representation across various healthcare settings in the city.

Data collection will primarily utilize online platforms such as email and social media channels to reach healthcare professionals. Participants will be selected randomly from databases of healthcare providers in Taif, ensuring a diverse and representative sample. The questionnaire will include demographic questions to contextualize responses and Likert-scale items aligned with the dimensions of the IS-Impact Model. This approach aims to gather quantitative data on healthcare professionals' perceptions of e-learning's effectiveness in enhancing their skills and job performance.

The quantitative nature of this research allows for statistical analysis of collected data to draw objective conclusions regarding the impact of e-learning on healthcare worker skills in Taif. This methodological approach ensures rigor and reliability in evaluating the effectiveness of e-learning as a professional development tool in the healthcare sector.

The research design of this study is structured as a descriptive cross-sectional approach, aimed at evaluating the impact of e-learning on the skill development of healthcare workers in Taif, Saudi Arabia. This design was selected due to its effectiveness in capturing the current state of phenomena across a specific population at a single point in time. By using a cross-sectional approach, the study is able to assess the attitudes, perceptions, and experiences of healthcare professionals with regard to e-learning within the context of their professional development.

The study employs a quantitative research method as its primary approach, leveraging a structured survey instrument to collect numerical data that can be analyzed statistically. This allows for the measurement of variables such as individual impacts of e-learning, which include learning outcomes, awareness, effectiveness in job performance, and productivity enhancements. The quantitative nature of the research facilitates the examination of relationships between these variables, providing insights into how e-learning contributes to skill development in the healthcare sector.

In addition to the quantitative method, the research also incorporates a qualitative component through open-ended questions included in the survey. This mixed-methods design enables a more comprehensive understanding of the subject matter by allowing participants to express their views and experiences in their own words, offering deeper insights into the challenges and benefits of e-learning that may not be captured through numerical data alone.

Overall, the research design is carefully crafted to ensure that the data collected is both robust and relevant, providing a solid foundation for analyzing the impact of e-learning on healthcare workers' skill development in Taif, Saudi Arabia. The integration of both quantitative and qualitative methods within this design enhances the study's ability to address the research questions comprehensively, offering a well-rounded perspective on the effectiveness of e-learning in this specific context.

Population of the study

Participants were randomly selected from databases of healthcare workers in Taif, ensuring a diverse and representative sample.

The sample size for this study was determined by referencing the most recent Statistical Yearbook published by the Saudi Ministry of Health in July 2024. This yearbook, which compiles data collected throughout 2023, includes comprehensive statistics on healthcare resources across the Kingdom. Specifically, the Part 2: Health Resources chapter provides detailed figures under the section titled "Health Manpower in MoH by Health Region, Category, Sex, and Nationality, 2023G." According to this source, the total number of healthcare professionals working in the city of Taif is 12,359, which was used as the population size for the sample calculation in this study (MOH, 2024).

To determine the appropriate sample size, a standard statistical formula was applied, taking into account a margin of error of 5% and a confidence level of 95%. Based on these parameters, the required sample size was calculated to be 373 respondents. This number would ideally provide a representative sample of the entire population of healthcare professionals in Taif, ensuring that the findings of the study are both accurate and reliable.

The study initially received 362 responses. After excluding 62 responses due to random or invalid entries, the remaining 300 responses were deemed valid for analysis. With this final sample size, the margin of error for the study's findings was calculated at 5.59%, which remains within an acceptable range for statistical accuracy. Although this margin of error is slightly higher than originally planned, the collected data still offers significant insights into the perspectives of healthcare professionals in Taif regarding e-learning and its impact on their skills development.

Several factors mitigate concerns about the adjusted sample size. First, a sample of 300 respondents represents a substantial portion of the healthcare workforce in Taif, allowing for robust analysis and reliable conclusions. Additionally, the diverse distribution methods used for the questionnaire—such as social media and official channels—ensured that the respondents likely represent a broad cross-section of healthcare professionals in the region, helping to enhance the generalizability of the study’s findings.

Data Collections procedures:

The choice of the IS-Impact Measurement Model (Gable et al., 2008) for data collection in this study is grounded in its established reliability and suitability for assessing the impact of e-learning on individual healthcare professionals. This model provides a structured approach to measure various dimensions of impact —information quality, system quality, individual impact, and organizational impact—within the context of IT systems, focusing specifically on Individual Impact within the context of healthcare education in Taif, Saudi Arabia.

The IS-Impact Measurement model has been widely recognized for its effectiveness in evaluating the outcomes of information systems, including learning effectiveness, awareness of job-related information, job effectiveness, and productivity enhancements (Alkhalaf et al., 2012). These dimensions align closely with the objectives of this research, which seeks to understand how e-learning influences the skills development of healthcare workers in Taif.

Drawing from previous studies that utilized similar methodologies (Alkhalaf et al., 2012), the questionnaire will include three structured questions related to demographic information (Gender, Age, Specialty of work), Likert-scale items content of Five questions based on the Individual-Impacts measure of the IS-Impact Model, and two open-ended questions that focuses on the benefits and challenges of utilizing e-learning in developing the health sector workers skills. Thus, employing the IS-Impact Measurement Model will facilitate a nuanced exploration of the impact of e-learning on healthcare professionals, contributing to both theoretical advancements and practical insights in healthcare education.

In this study, data collection was conducted through an online questionnaire designed using Google Forms, which was chosen for its accessibility and ease of use for

respondents. The survey was strategically distributed among healthcare professionals in Taif, Saudi Arabia, using a variety of communication channels to ensure a broad and representative sample. Specifically, the questionnaire link was shared within professional groups on popular social media platforms, including WhatsApp and Telegram, where healthcare workers in Taif actively participate. This approach allowed for efficient dissemination and encouraged participation from a diverse group of healthcare professionals across different institutions within the city.

In addition to social media distribution, the survey link was also sent via email to several healthcare organizations in Taif, targeting both their official communication channels and their public profiles on platforms like Twitter. This method was employed to reach a wider audience, including those who might not be active in social media groups but are connected through formal organizational channels. By utilizing these multiple avenues, the study aimed to maximize response rates and ensure the inclusion of varied perspectives from healthcare professionals across different sectors in Taif, thereby enhancing the reliability and validity of the collected data.

Study Limitation:

- **Sample Size and Representation:** The study's findings may be influenced by the sample size and the representativeness of healthcare professionals in Taif, Saudi Arabia, who participate in the survey. Limited access to a comprehensive database of all healthcare professionals in the region could affect the generalizability of the results.
- **Response Bias:** The accuracy and reliability of the data collected through the questionnaire may be impacted by response bias. Participants' willingness to provide honest and accurate responses, as well as their interpretation of the survey questions, could introduce bias into the findings.
- **Self-Reported Data:** The study relies on self-reported data from healthcare professionals regarding their experiences and perceptions of e-learning. This may introduce subjective interpretations and potential inaccuracies in reporting the impact of e-learning on their skills development.
- **Time Constraints:** The limited duration allocated for data collection and analysis could restrict the depth and breadth of the study's investigation into the various dimensions of e-learning impact on healthcare professionals in Taif.
- **External Factors:** External factors such as technological disruptions, changes in healthcare policies, and economic conditions may influence the implementation and outcomes of e-learning initiatives, thereby impacting the study results.

Method of Analysis

The data analysis in this study will involve both quantitative and qualitative approaches to ensure a comprehensive understanding of the impact of e-learning on healthcare workers' skill development in Taif, Saudi Arabia. The quantitative data, collected through Likert scale questions in Section B of the survey, will be analyzed using statistical software, primarily Excel and SPSS. These tools will allow for the effective management, organization, and statistical analysis of the data, facilitating the calculation of descriptive statistics such as means, standard deviations, and frequency distributions. Additionally, inferential statistics, such as correlation and regression analyses, may be employed to explore relationships between variables and to test hypotheses regarding the effectiveness of e-learning in enhancing individual performance.

A thematic analysis will be conducted for the qualitative data obtained from the open-ended questions in Section C of the survey. This approach involves manually reviewing the responses, identifying recurring themes or patterns, and categorizing the data accordingly. The manual method allows for a nuanced understanding of the participants' perspectives and experiences with e-learning, capturing insights that may not be evident through quantitative analysis alone. Key themes will be extracted, and representative quotes will be used to illustrate the main points raised by the respondents, providing a rich, contextual understanding of the challenges and benefits of e-learning as perceived by healthcare professionals.

By integrating these methods, the study will ensure a balanced and robust analysis, combining the strengths of both quantitative and qualitative data to draw meaningful conclusions about the impact of e-learning on healthcare worker skill development.

Chapter 4:

Practical Study

Results

The Results section provides a detailed analysis of the data collected through the survey and highlights key findings related to the impact of e-learning on the skills development of healthcare professionals in Taif, Saudi Arabia. The analysis includes both quantitative and qualitative responses, offering insights into how healthcare workers perceive the effectiveness of e-learning in enhancing job-related skills, productivity, and overall professional performance.

The statistical analysis focuses on demographic variables such as gender, age, and specialty of work to identify any significant differences in the perceptions of e-learning's impact. Additionally, open-ended responses are explored to uncover recurring themes related to the benefits and challenges faced by healthcare professionals in adopting e-learning. By integrating these findings, the results provide a comprehensive understanding of how e-learning is influencing healthcare professionals in the region and offer a basis for discussion in the subsequent sections.

Gender:

A total of 300 healthcare workers participated in this study. The sample comprised 165 males (55%) and 135 females (45%) as shown in figure 1.

1. Gender

300 responses

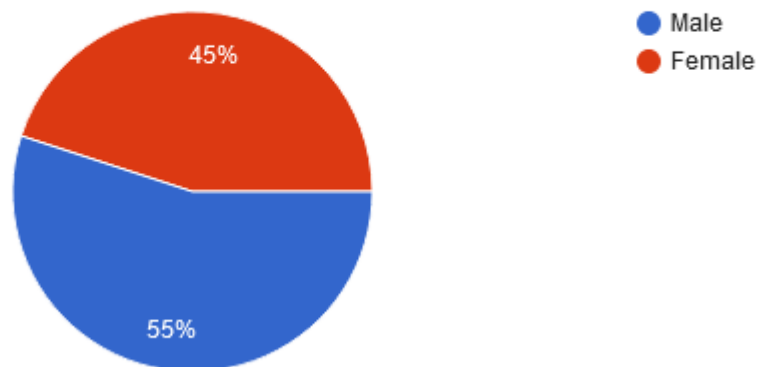


Figure 1: Frequency Distribution of Gender

Age:

Age was categorized into four ordinal groups: 20-30 years old, 31-39 years old, 40-49 years old, and 50 years old and over.

Age Group	Frequency	Percentage
20-30 years old	98	32.70%
31-39 years old	95	31.70%
40-49 years old	54	18.00%
50 years old and over	53	17.70%
Total	300	100%

Table 1: Frequency Distribution of Age

2. Age

300 responses

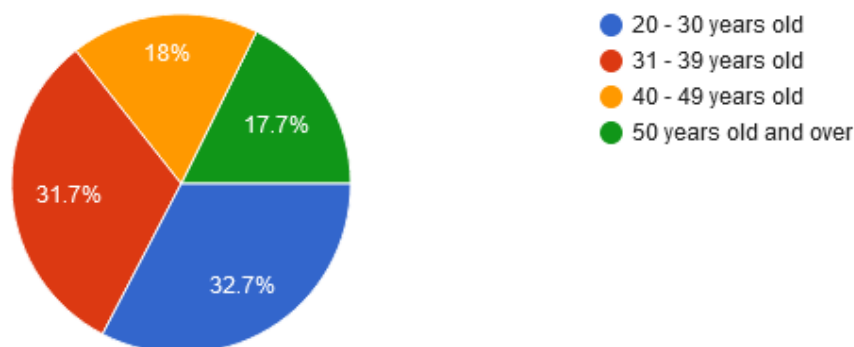


Figure 2: Frequency Distribution of Age

The majority of participants were in the 20-30 and 31-39 age groups, each comprising approximately one-third of the sample. The 40-49 and 50+ age groups represented a smaller proportion of the participants.

3. Specialty of work:

The specialty of work was categorized into two nominal categories: Clinical Health Practitioners and Non-Clinical Health Practitioners.

3. Speciality of work

300 responses

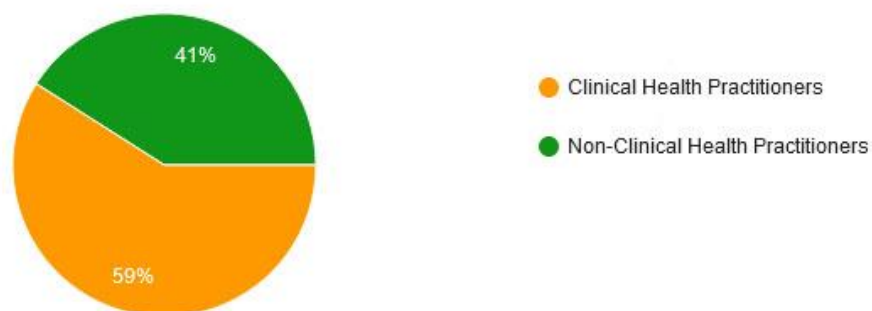


Figure 3: Frequency Distribution of Specialty of Work

The majority of participants were Clinical Health Practitioners, constituting 59% of the sample by 177. Non-Clinical Health Practitioners comprised the remaining 41% of the sample by 123.

Individual Impact:

1. Learning through the e-Learning system in learning process:

The provided tables show the descriptive statistics of the survey item "Learning through the e-Learning system in learning process".

Statistic	Description	Value
N	Number of valid responses	300
Mean	Average score	4.11
Median	Middle score	4
Mode	Most frequent score	4
Standard Deviation (Std. Deviation)	Variability around the mean	0.777
Variance	Square of the standard deviation	0.604

Table 2: Summary Statistics of Learning through the e-Learning system in learning process

The mean score (4.11) suggests that most respondents agreed with the statement "I have learned a lot through the presence of the e-Learning system in learning process". The median score (4.00) is also close to the mean, indicating that the distribution of responses is not heavily skewed. The mode (4) further confirms that the most common response was "Agree". The standard deviation (0.777) suggests a moderate variability in the responses.

1. I have learnt much through the presence of the e-Learning system in learning process.

300 responses

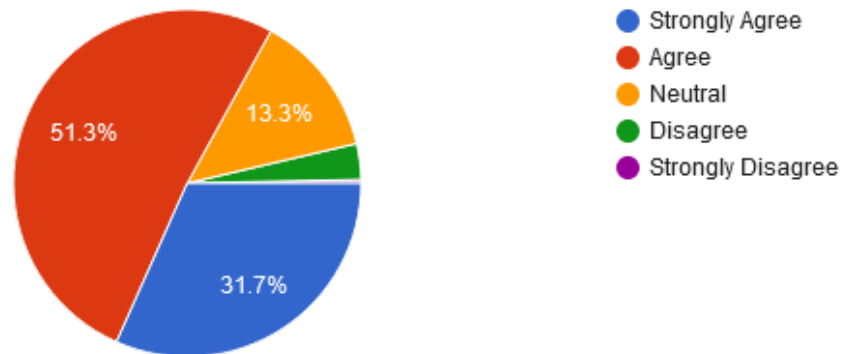


Figure 4: Frequency Distribution of Learning through the e-Learning system in learning process

Over half of the respondents (51.3%) agreed with the statement. An additional 31.7% strongly agreed. Together, these two categories indicate that a large majority of respondents (83%) found the e-Learning system helpful for learning. Only a small percentage of respondents disagreed (3.3%) or strongly disagreed (0.3%) with the statement. Overall, the results suggest that the e-Learning system was perceived positively by a large majority of the respondents.

2. E-Learning enhances awareness and recall of job related information or skills:

The provided tables show the descriptive statistics of the survey item " e-Learning enhances awareness and recall of job related information or skills".

Statistic	Description	Value
N	Number of valid responses	300
Mean	Average score	4.08
Median	Middle score	4
Mode	Most frequent score	4

Standard Deviation	Variability around the mean	0.948
Variance	Square of the standard deviation	0.899

Table 3: Summary Statistics of e-Learning enhances awareness and recall of job related information or skills

The mean score of 4.08 indicates a generally positive perception of e-learning's impact on enhancing awareness and recall of job-related information and skills. The median score of 4.00 further supports this positive perception, suggesting a central tendency towards agreement. The mode of 4 also aligns with the mean and median, indicating that the most frequent response was "Agree". The standard deviation of 0.948 suggests a moderate level of variability in responses, implying that opinions on this factor are somewhat spread out.

2. The e-Learning enhances my awareness and recall of job related information or skills.

300 responses

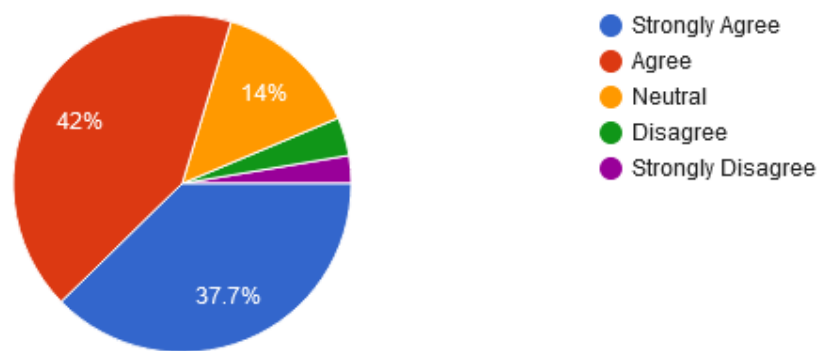


Figure 5: Frequency Distribution of e-Learning enhances job effectiveness

A majority of respondents (42.0%) agree that e-learning enhances their awareness and recall of job-related information and skills. Combined with those who strongly agree (37.7%), a total of 79.7% have a positive perception of e-learning's impact in this area. A smaller proportion of respondents (20.3%) are neutral or disagree with the statement.

Overall, the results indicate a generally positive perception of e-learning's effectiveness in enhancing awareness and recall of job-related information and skills.

3. E-Learning enhances job effectiveness

The provided tables show the descriptive statistics of the survey item " e-Learning enhances job effectiveness ".

Statistic	Description	Value
N	Number of valid responses	300
Mean	Average score	3.96
Median	Middle score	4
Mode	Most frequent score	4
Standard Deviation	Variability around the mean	0.904
Variance	Square of the standard deviation	0.818

Table 4: Summary Statistics of e-Learning enhances job effectiveness

The mean score of 3.96 indicates a generally positive perception of e-learning's impact on enhancing job effectiveness. The median score of 4.00 further supports this positive perception, suggesting a central tendency towards agreement. The mode of 4 also aligns with the mean and median, indicating that the most frequent response was "Agree". The standard deviation of 0.904 suggests a moderate level of variability in responses, implying that opinions on this factor are somewhat spread out.

3. Learning through the e-Learning enhances my effectiveness in the job.

300 responses

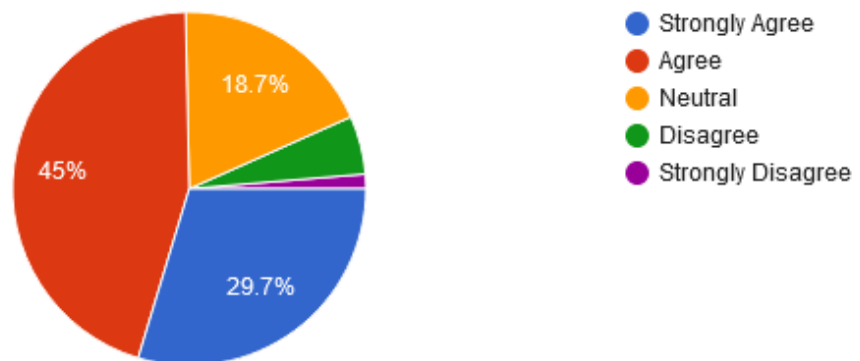


Figure 6: Frequency Distribution of e-Learning enhances job effectiveness

A majority of respondents (45.0%) agree that e-learning enhances their job effectiveness. Combined with those who strongly agree (29.7%), a total of 74.7% have a positive perception of e-learning's impact in this area. A smaller proportion of respondents (25.3%) are neutral or disagree with the statement. Overall, the results indicate a generally positive perception of e-learning's effectiveness in enhancing job performance.

4. E-Learning increases productivity

The provided tables show the descriptive statistics of the survey item " E-Learning increases productivity".

Statistic	Description	Value
N	Number of valid responses	300
Mean	Average score	3.88
Median	Middle score	4
Mode	Most frequent score	4
Standard Deviation	Variability around the mean	0.986
Variance	Square of the standard deviation	0.971

Table 5: Summary Statistics of E-Learning increases productivity

The mean score of 3.88 suggests a generally positive perception of e-learning's impact on increasing productivity. The median score of 4.00 further supports this positive perception, indicating a central tendency towards agreement. The mode of 4 also aligns with the mean and median, showing that the most frequent response was "Agree". The standard deviation of 0.986 suggests a moderate level of variability in responses, implying that opinions on this factor are somewhat spread out.

4. Learning through the e-Learning increases my productivity.

300 responses

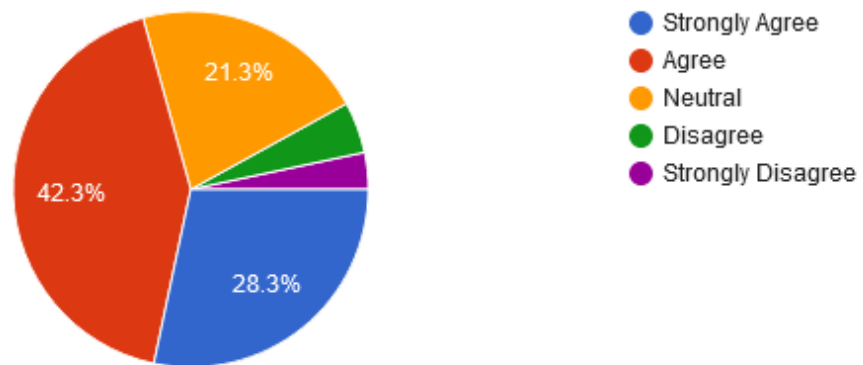


Figure 7: Frequency Distribution of E-Learning increases productivity

A majority of respondents (42.3%) agree that e-learning increases their productivity. Combined with those who strongly agree (28.3%), a total of 70.6% have a positive perception of e-learning's impact on productivity. A smaller proportion of respondents (29.3%) are neutral or disagree with the statement. Overall, the results indicate a generally positive perception of e-learning's effectiveness in increasing productivity.

5. Healthcare workers have a positive attitude towards the e-Learning

The provided tables show the descriptive statistics of the survey item "Healthcare workers have a positive attitude towards the e-Learning".

Statistic	Description	Value
N	Number of valid responses	300
Mean	Average score	3.96
Median	Middle score	4
Mode	Most frequent score	4
Standard Deviation	Variability around the mean	0.831
Variance	Square of the standard deviation	0.69

Table 6: Summary Statistics of Healthcare workers have a positive attitude towards the e-Learning

The mean score of 3.96 indicates a generally positive attitude towards the e-learning system among healthcare workers. The median score of 4.00 further supports this positive perception, suggesting a central tendency towards agreement. The mode of 4 also aligns with the mean and median, indicating that the most frequent response was "Agree". The standard deviation of 0.831 suggests a moderate level of variability in responses, implying that opinions on this factor are somewhat spread out.

5. Most healthcare workers have a positive attitude towards or evaluation of the e-Learning system in the learning process.

300 responses

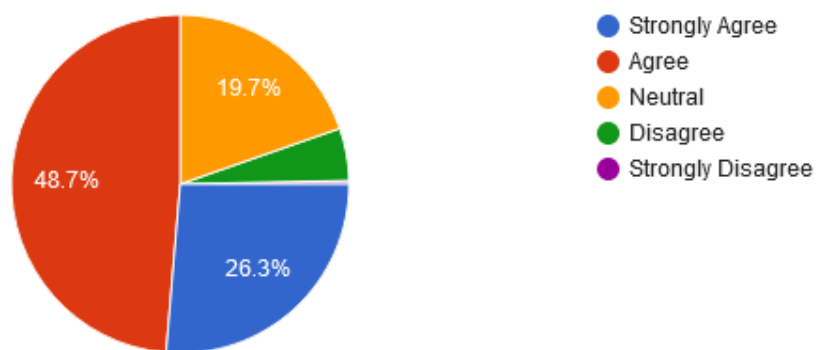


Figure 8: Frequency Distribution of Healthcare workers have a positive attitude towards the e-Learning

A majority of healthcare workers (48.7%) agree that most healthcare workers have a positive attitude towards the e-learning system. Combined with those who strongly agree (26.3%), a total of 75% have a positive perception of the general attitude towards e-learning. A smaller proportion of respondents (25.0%) are neutral or disagree with the statement. Overall, the results suggest a predominantly positive perception of the overall attitude of healthcare workers towards the e-learning system.

Statistical tests:

Individual impact factors according to Gender:

Conducting Mann-Whitney U test between variable Gender and Individual impact factors. As shown in Table 7, based on the provided data and a significance level of 0.05, there are no statistically significant differences between males and females in terms of Learning through e-learning (p-value = 0.658), Information awareness and recall (p-value = 0.339), Job effectiveness (p-value = 0.217), and Positive attitude towards e-learning (p-value = 0.907). There is a statistically significant difference between males and females in terms of Productivity (p-value = 0.082). Overall, there is evidence to suggest that male healthcare workers perceive a greater increase in productivity through e-learning compared to female healthcare workers. However, there are no significant gender differences in the other four factors.

	Gender	N	Mean Rank	Sum of Ranks
Learning through the e-Learning	Male	165	152.33	25134.00
	Female	135	148.27	20016.00
	Total	300		
Information awareness and recall	Male	165	154.54	25499.50
	Female	135	145.56	19650.50
	Total	300		
Job effectiveness	Male	165	155.74	25697.00
	Female	135	144.10	19453.00
	Total	300		
Productivity	Male	165	157.94	26060.00
	Female	135	141.41	19090.00
	Total	300		
Positive attitude towards the e-Learning	Male	165	150.99	24913.50
	Female	135	149.90	20236.50
	Total	300		

Test Statistics ^a					
	Learning through the e-Learning	Information awareness and recall	Job effectiveness	Productivity	Positive attitude towards the e-Learning
Mann-Whitney U	10836.000	10470.500	10273.000	9910.000	11056.500
Wilcoxon W	20016.000	19650.500	19453.000	19090.000	20236.500
Z	-.443-	-.957-	-1.236-	-1.739-	-.117-
Asymp. Sig. (2-tailed)	.658	.339	.217	.082	.907
a. Grouping Variable: Gender					

Table 7: Individual impact factors according to Gender

Individual impact factors according to age:

Conducting One-Way Anova between age variable and Individual impact factors.

As shown in Table 8 there are no statistically significant differences at the significance level (0.05) between the Individual-impact factors of (Learning through e-learning, Information awareness and recall, Job effectiveness, Productivity, and Positive attitude towards e-learning) according to the variable (age).

Oneway

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
Learning through the e-Learning	Between Groups	2.473	3	.824	1.370	.252
	Within Groups	178.113	296	.602		
	Total	180.587	299			
Information awareness and recall	Between Groups	5.854	3	1.951	2.196	.089
	Within Groups	263.062	296	.889		
	Total	268.917	299			
Job effectiveness	Between Groups	4.072	3	1.357	1.670	.173
	Within Groups	240.525	296	.813		
	Total	244.597	299			
Productivity	Between Groups	2.298	3	.766	.787	.502
	Within Groups	288.139	296	.973		
	Total	290.437	299			
Positive attitude towards the e-Learning	Between Groups	3.068	3	1.023	1.489	.218
	Within Groups	203.368	296	.687		
	Total	206.437	299			

Table 8: Individual impact factors according to age

Individual impact factors according to Specialty of work:

Conducting Mann-Whitney U test between variable Gender and Individual impact factors as shown in Table 9. Based on the provided data and a significance level of 0.05, there are statistically significant differences between Clinical Health Practitioners and Non-Clinical Health Practitioners in terms of Learning through e-learning (p-value = 0.023) and Positive attitude towards the e-Learning (p-value = 0.008), the p-values are less than 0.05. There are no statistically significant differences between the two groups in terms of Information awareness and recall, Job effectiveness, and, Productivity.

Overall, the results suggest that Clinical Health Practitioners and Non-Clinical Health Practitioners have significantly different perceptions regarding the impact of e-learning on learning and their overall attitude towards e-learning. However, there are no

significant differences between the two groups in terms of how e-learning affects information awareness and recall, job effectiveness, or productivity.

Ranks				
	Speciality of work	N	Mean Rank	Sum of Ranks
Learning through the e-Learning	Clinical Health Practitioners	177	141.85	25107.00
	Non-Clinical Health Practitioners	123	162.95	20043.00
	Total	300		
Information awareness and recall	Clinical Health Practitioners	177	147.66	26136.00
	Non-Clinical Health Practitioners	123	154.59	19014.00
	Total	300		
Job effectiveness	Clinical Health Practitioners	177	146.72	25969.50
	Non-Clinical Health Practitioners	123	155.94	19180.50
	Total	300		
Productivity	Clinical Health Practitioners	177	146.37	25908.00
	Non-Clinical Health Practitioners	123	156.44	19242.00
	Total	300		
Positive attitude towards the e-Learning	Clinical Health Practitioners	177	140.30	24833.00
	Non-Clinical Health Practitioners	123	165.18	20317.00
	Total	300		

Test Statistics^a

	Learning through the e-Learning	Information awareness and recall	Job effectiveness	Productivity	Positive attitude towards the e-Learning
Mann-Whitney U	9354.000	10383.000	10216.500	10155.000	9080.000
Wilcoxon W	25107.000	26136.000	25969.500	25908.000	24833.000
Z	-2.274-	-.729-	-.967-	-1.047-	-2.637-
Asymp. Sig. (2-tailed)	.023	.466	.333	.295	.008

a. Grouping Variable: Speciality of work

Table 9: Individual impact factors according to Specialty of work

Discussion:

This study aimed to evaluate the individual impact of e-learning on healthcare workers in Taif, a non-major city in Saudi Arabia, by examining both the benefits and challenges of this educational approach. The results provide a nuanced understanding of how healthcare professionals in this region perceive the effectiveness of e-learning in enhancing their skills and knowledge.

The statistical analysis of the survey responses shows a generally positive perception of e-learning. Most respondents reported favorable views regarding the influence of e-learning on their learning processes, job performance, and professional growth. The gender distribution among the respondents was nearly balanced, with males constituting 55% and females 45%. The age groups of 20-30 years and 31-39 years formed the majority of the sample, indicating that younger professionals are more likely to engage in e-learning. This trend aligns with other studies that have observed a higher adoption rate of digital learning technologies among younger age groups due to their greater familiarity with technology (Algahtani et al., 2020).

The data revealed that clinical health practitioners represent 59% of the sample, suggesting that those involved directly in patient care are more inclined to participate in e-learning programs. This is consistent with previous research that highlights the growing importance of continuing education in clinical settings to maintain competency and adapt to rapidly changing medical knowledge (Chaker et al., 2024). The remaining 41% were non-clinical health practitioners, indicating that e-learning also holds value for administrative and support staff within the healthcare system.

One of the key findings is that e-learning positively impacts individual learning outcomes. The mean score of 4.11 for the item “Learning through the e-Learning system in the learning process” demonstrates strong agreement among participants that e-learning is effective in promoting knowledge acquisition. Similarly, a majority of respondents (79.7%) agreed that e-learning enhances their awareness and recall of job-related information and skills, with a mean score of 4.08. These results suggest that e-learning platforms can be highly effective in delivering content that supports skill development, especially when compared to traditional in-person learning.

However, qualitative feedback from open-ended questions highlighted specific challenges that affect the effectiveness of e-learning in Taif. A recurring issue mentioned by respondents was the language barrier, with some healthcare workers struggling to understand content delivered in English. This challenge is particularly significant in non-major cities where English proficiency may be lower. Such language-related difficulties echo findings from (Alavudeen et al., 2021), who identified language as a critical barrier to the successful implementation of e-learning in non-metropolitan areas.

Internet connectivity issues were also frequently cited as a major challenge. Participants reported difficulties due to slow internet speeds, outdated computers, and technical glitches, which hindered their learning experience. These infrastructural problems are consistent with previous studies conducted in similar contexts, where reliable access to digital resources remains a barrier to effective e-learning (Alavudeen et al., 2021). The limited availability of stable internet connections in non-major cities like Taif exacerbates this issue, making it harder for healthcare workers to fully benefit from online educational platforms.

Economic and social disparities were also noted as obstacles to e-learning adoption. Respondents mentioned that the cost of specialized courses and the time required to adapt to new technologies are significant burdens. Additionally, the lack of sufficient time to engage in e-learning due to work commitments and the difficulty in balancing learning with other responsibilities were highlighted as challenges. These concerns are consistent with the findings of Vaona et al., (2018), who observed that healthcare professionals often face difficulties in prioritizing professional development when faced with demanding work schedules.

On the positive side, respondents emphasized several benefits of e-learning that make it a valuable tool for skill development in the healthcare sector. The ability to learn without relocating was frequently mentioned as a major advantage, particularly in a region like Taif, where healthcare workers often need to travel to larger cities like Jeddah for professional development. This flexibility is critical in allowing healthcare professionals to access high-quality education while staying in their current positions. Additionally, the convenience of being able to tailor learning schedules to individual needs was another advantage identified by respondents. This aligns with global trends that highlight flexibility as one of the main drivers behind the increasing popularity of e-learning (Alavudeen et al., 2021).

Another benefit identified is the capacity to review content multiple times, which is particularly valuable in a field as complex as healthcare. Respondents noted that the ability to revisit training materials at their own pace enables deeper understanding and retention of information. This self-directed learning approach is in line with the principles of adult learning theory, which emphasizes the importance of allowing learners to control their educational journey (Vaona et al., 2018).

The results also indicate that e-learning enhances job effectiveness and productivity, although to a slightly lesser extent compared to other factors. A mean score of 3.96 for job effectiveness and 3.88 for productivity suggests that while most respondents perceive a positive impact, there is some variability in how these benefits are experienced. Notably, the Mann-Whitney U test revealed that male healthcare workers are more likely to perceive a productivity increase through e-learning than their female counterparts, which could point to gender-based differences in how e-learning is utilized or perceived in professional settings.

A critical area where e-learning faces limitations is in promoting interactive communication and practical application, which are essential in healthcare education. Respondents noted that the lack of real-time interaction with instructors and peers and the inability to participate in hands-on demonstrations are significant drawbacks of e-learning. These challenges underscore the need for blended learning approaches that combine online education with face-to-face components to address the practical training needs of healthcare professionals (Chaker et al., 2024).

In summary, while the findings indicate that e-learning is generally well-received among healthcare workers in Taif, certain challenges must be addressed to optimize its effectiveness. Language barriers, technical limitations, and the lack of interactive elements are key areas that require attention. On the other hand, the flexibility, accessibility, and ability to customize learning experiences are clear advantages that make e-learning a valuable tool in healthcare education. Future research and interventions should focus on enhancing the infrastructure and support systems for e-learning in non-major cities like Taif to ensure that all healthcare workers can benefit from these opportunities.

Recommendation

Based on the findings of this study, several recommendations can be proposed to enhance the effectiveness of e-learning for healthcare workers in Taif. First, it is essential to address the infrastructural challenges identified by respondents, particularly regarding internet connectivity and access to updated technology. Healthcare organizations and educational providers should invest in improving digital infrastructure, especially in non-major cities like Taif, where reliable internet and advanced hardware are less accessible. Collaboration between government bodies, healthcare institutions, and internet service providers could lead to initiatives that make high-speed internet more widely available, thereby ensuring healthcare professionals can fully participate in e-learning programs.

Secondly, language barriers were highlighted as a significant challenge in this study, particularly for healthcare workers who may struggle with content delivered in English. It is recommended that e-learning platforms consider offering bilingual or fully Arabic-language content to better accommodate the needs of healthcare professionals in regions like Taif. Additionally, incorporating clear and concise language, along with visual aids and interactive elements, can enhance understanding and engagement. Educational institutions should also provide language support resources, such as workshops or supplementary materials, to help learners improve their comprehension of English medical terminology.

Another important recommendation involves the integration of more interactive and practical elements into e-learning programs. The lack of real-time interaction and hands-on practice was a recurring concern among respondents. To mitigate this, a blended learning approach that combines online education with face-to-face sessions should be considered. Hybrid models that allow for practical demonstrations, peer discussions, and interactive Q&A sessions can significantly improve the learning experience by bridging the gap between theoretical knowledge and practical skills. Healthcare institutions could also

explore virtual simulations and gamified learning as innovative methods to enhance engagement and provide practical training in a digital format.

Given the time constraints faced by healthcare professionals, it is also recommended that e-learning programs be designed with greater flexibility and personalization. Modular content delivery, where learners can access short, self-contained modules at their convenience, could help professionals balance their work and study schedules. Offering more options for self-paced learning and asynchronous participation would allow healthcare workers to engage with content according to their availability, making e-learning more manageable and appealing for busy professionals.

Finally, ongoing evaluation and feedback mechanisms should be integrated into e-learning programs to continuously improve their relevance and effectiveness. Institutions providing e-learning should regularly gather feedback from participants to assess areas for improvement and identify emerging needs. Engaging stakeholders, including healthcare workers, educators, and administrators, in the co-design of e-learning content can also ensure that these programs remain aligned with the real-world demands of the healthcare sector. By addressing these recommendations, e-learning can be optimized as a key tool for professional development, ultimately contributing to improved healthcare outcomes in Taif and similar regions.

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Appendix:

Appendix A: Survey for Healthcare Worker:

Dear Respondent,

I am a Master's candidate (Project Management) at the University of Midocean Currently, I am conducting a study titled " The Impact of E-learning on Health Sector Worker Skills Development: Applied study in Taif, Saudi. This is done by identifying the perspectives of health sector workers on the effectiveness of e-learning (online) in developing their skills in the field of work.

I would like to request your cooperation to answer this questionnaire. Any information obtained will be kept confidential and only used for academic purposes. Your cooperation is highly appreciated.

Thank you in advance for agreeing to participate in this study. If you have any questions, please do not hesitate to contact me Suha Abdulwahab (Master Candidate)
Suha20Mhmd@gmail.com.

Section A: Demographic Characteristics

Please tick (✓) the appropriate choice

1- Gender:

- ☐ Male
- ☐ Female

2- Age:

- ☐ 20 - 30 years old
- ☐ 31 - 39 years old
- ☐ 40 - 49 years old
- ☐ 50 years old and over

3- Specialty of work:

- ☐ Clinical Health Practitioners
- ☐ Non-Clinical Health Practitioners

Section B: Individual-Impacts

Individual Impacts are concerned with how eLearning has influenced your individual performance. This section seeks to assess whether eLearning has helped your (e.g.): ability to interpret information accurately, understanding of information and work related activities in your agency, decision making effectiveness, and overall productivity.

Please indicate your degree of agreement or disagreement with the following statements, so please sign (✓) for the choice that reflects your opinion by choosing one of the five alternatives.

Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. I have learnt much through the presence of the e-Learning system in learning process.					
2. The e-Learning enhances my awareness and recall of job related information or skills.					
3. Learning through the e-Learning enhances my effectiveness in the job.					
4. Learning through the e-Learning increases my productivity.					
5. Most healthcare workers have a positive attitude towards or evaluation of the e-Learning system in the learning process.					

Section C: Open-Ended Questions

1. In your opinion, what are the benefits of e-learning in developing your skills in your field of work compared to traditional learning?

.....
.....

2. In your opinion, what are the challenges you have faced from e-learning in developing your skills in your field of work?

.....
.....

Gratitude:

We appreciate you for sparing your time to fill out the survey. Your involvement means a lot to us and we highly value it.

المخلص

يهدف هذا البحث إلى دراسة أثر التعليم الإلكتروني على تنمية مهارات العاملين في القطاع الصحي في الطائف، المملكة العربية السعودية. مع ازدياد تبني الأساليب التعليمية الرقمية في قطاع الرعاية الصحية، تبرز الحاجة لفهم مدى فعاليتها في تعزيز المهارات، خاصة في المناطق التي تعتمد بشكل كبير على أساليب التعلم التقليدية. ركزت الدراسة على العاملين في القطاع الصحي في الطائف، من خلال استبيان كمي وأسئلة مفتوحة لجمع البيانات حول تجاربهم مع التعليم الإلكتروني. تهدف الدراسة إلى تقييم مدى مساهمة التعليم الإلكتروني في التطوير المهني، وتحديد الفوائد والتحديات التي يواجهها العاملون في القطاع الصحي، واستكشاف الاختلافات في التصورات بناءً على العوامل الديموغرافية مثل الجنس والعمر والتخصص الوظيفي.

تم جمع 300 استجابة صالحة، مما يمثل نسبة استجابة تتماشى بشكل كبير مع حجم العينة المحدد مسبقاً. تضمنت العينة 55% من الذكور و45% من الإناث، مع توزيع عمري متنوع وأغلبية تمثل الممارسين الصحيين الإكلينيكين. أظهرت التحليلات الإحصائية عدة نتائج رئيسية؛ حيث كان التعليم الإلكتروني مُعترفًا به بشكل واسع كأداة مفيدة، حيث أشار غالبية المشاركين إلى أنه يُعزز التعلم، ويُحسن الأداء الوظيفي، ويدعم تطوير المهارات. أظهر 83% من المشاركين أن التعليم الإلكتروني ساهم بشكل إيجابي في عملية التعلم، بينما أفاد أكثر من 74% أنه حسن أدائهم الوظيفي وزاد من إنتاجيتهم.

أبرزت التحليلات النوعية للإجابات المفتوحة عدة محاور متكررة تتعلق بفوائد وتحديات التعليم الإلكتروني. تضمنت الفوائد الرئيسية المرونة في تحديد الجداول الزمنية، وإمكانية التعلم وفقاً للوتيرة الشخصية، وسهولة الوصول إلى الموارد التعليمية دون الحاجة للتنقل. من جهة أخرى، تم التطرق إلى تحديات مثل حواجز اللغة، البنية التحتية الرقمية غير الملائمة، وغياب العناصر التفاعلية. أعرب العديد من المشاركين عن قلقهم من قلة الفرص للتدريب العملي والتفاعل المباشر، والتي يعتبرونها ضرورية لتعليم الرعاية الصحية. كما كشفت الدراسة عن اختلافات في التصورات بين الفئات الديموغرافية المختلفة؛ حيث أظهر الذكور تأثيراً إيجابياً أعلى قليلاً في تحسين الإنتاجية مقارنة بالإناث. بالإضافة إلى ذلك، لوحظت فروقات معنوية بين الممارسين الصحيين الإكلينيكين وغير الإكلينيكين فيما يتعلق بتأثير التعليم الإلكتروني على نتائج التعلم والمواقف تجاهه.

تخلص الدراسة إلى أن التعليم الإلكتروني يُعتبر أداة قيمة لتنمية مهارات العاملين في القطاع الصحي بالطائف، إلا أن هناك مجالات تحتاج إلى تحسين لتحقيق أقصى فاعلية ممكنة. تشمل التوصيات تحسين البنية التحتية الرقمية، وتوفير محتوى ثنائي اللغة، وإدراج عناصر تفاعلية وعملية، وتقديم خيارات تعلم أكثر تخصيصاً. من خلال معالجة هذه العوامل، يمكن تحسين التعليم الإلكتروني لدعم التطوير المهني المستمر للعاملين في القطاع الصحي، مما يساهم في تحسين خدمات الرعاية الصحية في المنطقة.

عنوان البحث باللغة العربية

أثر التعليم الإلكتروني على تنمية مهارات العاملين في القطاع الصحي: دراسة تطبيقية في الطائف،
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د. فايز علي جراد

العام الدراسي:

الفصل الدراسي الثاني من عام 2024