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ORIGINAL RESEARCH

Challenges of Healthcare Systems in Saudi Arabia to Delivering Vision 2030: An Empirical Study From Healthcare Workers Perspectives

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Background and Aim: This study explores the key challenges affecting the healthcare system in Saudi Arabia as it strives to achieve the objectives of Vision 2030. Unlike previous research, which has primarily focused on policy and structural reforms, this study provides empirical insights from healthcare workers, offering a frontline perspective on the barriers to effective healthcare transformation.

Methods: A cross-sectional survey was conducted among 383 healthcare professionals from public and private hospitals. The questionnaire covered challenges related to capacity and infrastructure, workforce shortages, digital transformation, preventive healthcare, coordination and integration, healthcare financing, public awareness, quality of care, and disease prevention. Data were analyzed using descriptive statistics, t-tests, and ANOVA to assess variations in perceptions based on professional roles, work experience, gender, and hospital type.

Results: The findings reveal workforce shortages, infrastructure limitations, and digital transformation gaps as the most pressing concerns. Notable differences in perceptions highlight the need for tailored interventions across different healthcare roles and settings. Addressing these challenges requires strategic workforce planning, investment in infrastructure, digital innovation, and sustainable financing models.

Conclusion: This study contributes to the literature by offering evidence-based recommendations for policymakers and healthcare administrators, aligning healthcare system improvements with Vision 2030 objectives. The insights provided can help shape targeted strategies to enhance healthcare efficiency, accessibility, and resilience in Saudi Arabia.

Keywords: Vision 2030, Saudi Arabia, healthcare challenges, transformation, workforce, digital health, policy reform

Introduction

Saudi Arabia's Vision 2030 is a transformative national initiative aimed at diversifying the economy, modernizing public services, and improving healthcare quality and accessibility. A core objective of this vision is the transformation of the healthcare system, ensuring high-quality service delivery, better disease prevention, and enhanced digital integration.[1] Despite significant policy reforms and financial investments, the healthcare sector faces persistent challenges that hinder progress toward these goals. Workforce shortages, infrastructure limitations, fragmented care coordination, slow adoption of digital health solutions, and financial constraints continue to create barriers to achieving Vision 2030's healthcare objectives.[2,3] If these challenges remain unaddressed, Saudi Arabia risks inefficiencies in healthcare service delivery, growing disparities in care accessibility, and an increased burden on healthcare professionals.[4]

Several studies have explored the barriers to healthcare system transformation in Saudi Arabia. Prior research has examined regional disparities in healthcare accessibility,[3] workforce shortages and recruitment difficulties,[5,6] and the role of digital transformation.[7,8] However, most of these studies adopt macro-level policy perspectives, failing to capture the real-world operational challenges experienced by frontline healthcare professionals.[9] The perspectives of physicians, nurses, and administrators—those responsible for delivering healthcare—remain underexplored, limiting the practical applicability of previous research findings.[10,11]

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Although some studies provide insights into specific healthcare challenges, their scope remains limited. Alkhamis & Miraj[10] analyzed healthcare accessibility disparities between rural and urban areas but did not assess workforce challenges or digital transformation barriers. Al-Hanawi et al[6] identified workforce shortages as a critical issue but did not evaluate how different professional roles (eg, physicians, nurses, administrators) experience these shortages. Similarly, Rahman & Al-Borie[11] discussed healthcare policy reforms but did not include empirical data from frontline healthcare workers, limiting the study's practical relevance.

While Saudi Arabia has made significant efforts to expand healthcare infrastructure and implement digital health solutions, the slow pace of adoption and fragmented implementation processes present major challenges.[12–17] The lack of interoperability among electronic health records (EHRs) affects patient data sharing and clinical decision-making, which in turn impacts service efficiency and patient outcomes.[17,18] Additionally, concerns related to data privacy, cybersecurity risks, and digital literacy gaps among healthcare professionals continue to hinder the adoption of new technologies.[19] Similar challenges have been observed in other healthcare systems, where digital transformation requires robust cybersecurity measures and extensive training programs to ensure workforce readiness.[20,21]

Despite growing awareness of preventive healthcare strategies, cultural barriers, lack of public health literacy, and socioeconomic disparities continue to hinder the effectiveness of disease prevention initiatives.[22] Research suggests that health education programs and public engagement campaigns are essential for promoting early disease detection and preventive healthcare adoption.[23,24] Additionally, the fragmentation of healthcare services contributes to inefficiencies in coordination across hospitals, primary care centers, and specialized clinics, leading to delayed treatments and duplication of services.[25,26] To address these challenges, integrated healthcare models and interdisciplinary collaboration among healthcare providers have been proposed as key solutions.[27,28]

Financial sustainability remains another persistent concern, as rising healthcare costs and funding constraints challenge the ability to maintain high-quality services while ensuring equitable access.[29] Balancing value-based care models, public-private partnerships, and strategic investments in primary care is crucial for achieving long-term financial stability.[30,31] International case studies highlight that innovative financing mechanisms, such as pay-for-performance models and healthcare bundling strategies, can improve cost efficiency and service quality.[32]

One of the most pressing issues in the Saudi healthcare system is workforce shortages, which directly impact service quality, patient safety, and healthcare worker well-being.[33–39] While global workforce planning models offer potential solutions, Saudi Arabia lacks localized, data-driven research on workforce dynamics, recruitment challenges, and retention strategies.[34,35] High turnover rates, burnout, and a shortage of specialized professionals further exacerbate these issues, placing additional strain on the healthcare system.[36,37] Addressing workforce challenges requires comprehensive workforce planning, structured training programs, and policies that promote healthcare worker retention.[38–41]

This study aims to bridge the existing research gap by providing empirical insights from healthcare professionals, including physicians, nurses, and administrators from public and private hospitals in Saudi Arabia. Unlike previous studies, which primarily focus on policy-level discussions, this research systematically examines how healthcare challenges differ across professional roles, experience levels, gender, and hospital type (public vs private). Additionally, it offers a comparative analysis of the unique barriers faced by public and private healthcare institutions, identifying sector-specific challenges and tailored intervention strategies.

The primary objective of this study is to empirically assess the key challenges confronting Saudi Arabia's healthcare system from the perspective of frontline healthcare professionals. Specifically, this study aims to identify the most pressing challenges to healthcare transformation under Vision 2030, analyze variations in these challenges across different demographic and professional groups, and provide evidence-based recommendations to overcome them. By offering a systematic, data-driven analysis, this research contributes to ongoing discussions on healthcare system reform, workforce planning, digital transformation, and financial sustainability. The findings will serve as a valuable resource for policymakers, healthcare administrators, and industry stakeholders in designing strategic interventions that enhance healthcare efficiency, accessibility, and resilience, ensuring that Saudi Arabia's healthcare system is well-positioned to achieve Vision 2030's long-term objectives.

Methods

A cross-sectional survey design was adopted in this study. The details of study design are presented in following sections.

Study Setting & Participants

Given the context of this study which focuses on investigating the challenges confronting the healthcare systems in Saudi Arabia, healthcare workers including specialist physicians, physicians, nurses, nurse managers, administrators/managers were considered for this study. Three public and two private hospitals in Saudi Arabia were selected for the study. Participants from different hospitals were recruited through hospital networks through emails by providing with the survey link and the information sheet, explaining the purpose of the study and their rights to participation.

To improve the generalizability of the findings, participants were recruited from three public and two private hospitals, covering both government-funded and privately managed healthcare institutions. This ensured that the sample reflected the diversity of Saudi Arabia's healthcare sector, where public hospitals provide state-funded universal healthcare, while private hospitals cater to a mixed-income population with varying levels of access to healthcare services. Additionally, gender, work experience, and professional roles were carefully considered to ensure a balanced representation of perspectives within the study. Participants were required to meet specific eligibility criteria to ensure the relevance and reliability of the study findings. Only physicians, specialist physicians, nurses, nurse managers, and administrators were included, as these roles are central to hospital operations and service delivery. To ensure that participants had sufficient exposure to healthcare system challenges, they needed to have at least one year of work experience in a Saudi healthcare facility. Additionally, the study focused on public and private hospital settings to enable a comparative analysis of sector-specific challenges. Participation was entirely voluntary, and all respondents were required to provide informed consent before completing the survey.

Despite these efforts, we acknowledge that generalizability may be somewhat limited, as the study focused only on hospital-based healthcare workers, excluding those in primary care, community health, and specialized outpatient settings. Future studies may expand the sampling framework to include these populations for a more comprehensive understanding of healthcare system challenges.

Sampling

The study adopted a purposive sampling technique[42] to ensure that only healthcare professionals actively involved in service delivery were selected. This approach allowed us to focus on physicians, nurses, nurse managers, and administrators, as these roles are directly impacted by infrastructure limitations, workforce shortages, digital transformation barriers, and healthcare financing constraints. Purposive sampling ensured that the responses were relevant to the study objectives and aligned with the realities of healthcare system transformation under Vision 2030.

In addition, convenience sampling[42] was used to recruit easily accessible healthcare workers from selected hospitals. This method was chosen to facilitate efficient data collection, particularly in a setting where participation might be constrained by heavy workloads, shift schedules, and administrative approvals. While convenience sampling may introduce some level of selection bias, the inclusion of multiple hospitals and diverse professional roles enhances the representativeness of the sample in relation to Saudi Arabia's broader healthcare workforce.

Questionnaire Design

The questionnaire (see Appendix B) was systematically developed based on an extensive review of prior research on healthcare challenges, transformation, and Vision 2030 initiatives. Each section of the questionnaire was adapted previous studies to ensure reliability and relevance to the Saudi Arabian healthcare context. The questionnaire begins with a clear introduction providing information about the study's purpose, ethical approval, and confidentiality measures, ensuring participants' informed consent. The demographic section collects essential information about participants' age, gender, role/department, experience, and the type of hospital they work in. This categorization enables researchers to analyze responses across different subgroups effectively, as supported by similar research methodologies.[3,11] The core sections of the questionnaire assess specific healthcare challenges, each adapted from prior empirical studies addressing

healthcare transformation and workforce-related issues. These include: Capacity and Infrastructure,[12] Healthcare Workforce Challenges,[6,7] Digital Transformation,[22,25] Preventive Healthcare,[27] Coordination and Integration,[31] Healthcare Financing (aligned with Hsiao & Yip, 2024),[35] Public Awareness and Education,[39] Quality of Care,[42] Disease Prevention and Control.[39]

Each challenge is assessed through Likert scale questions, allowing participants to provide nuanced responses regarding their perceptions and experiences. Overall, the questionnaire is structured to gather detailed insights into the challenges facing healthcare systems in Saudi Arabia and their alignment with the goals of Vision 2030, facilitating informed decision-making and strategic interventions to address these challenges effectively.

The survey instrument was originally developed in English, based on prior studies examining healthcare challenges and transformation in Saudi Arabia. However, considering the diverse linguistic backgrounds of healthcare workers in Saudi Arabia, the questionnaire was translated into Arabic to enhance accessibility and ensure clarity. A rigorous translation process was followed to maintain linguistic and conceptual equivalence. First, a bilingual expert fluent in both English and Arabic translated the questionnaire from English to Arabic. Next, an independent bilingual healthcare researcher reviewed the translated version to ensure technical accuracy. To validate the translation, a backward translation was performed by a second translator who was not involved in the initial translation, ensuring that the meaning of the original questions remained intact. Any discrepancies between the original and back-translated versions were resolved through discussion among the research team and healthcare professionals.

Before full-scale data collection, a pilot test was conducted to evaluate the clarity, reliability, and validity of the Arabic version questionnaire. The pilot study involved 13 participants, including two physicians, eight nurses, and three healthcare managers, selected from both public and private hospitals. Participants were asked to complete the questionnaire and provide feedback on question clarity, relevance, and ease of understanding. The primary objectives of the pilot test were: Assessing Internal Consistency: Cronbach's alpha was computed to ensure the reliability of each section; Evaluating Clarity and Comprehension: Participants provided qualitative feedback on ambiguous or difficult-to-answer questions; Testing Response Time: The time required to complete the survey was recorded to ensure feasibility; Checking Response Variability: Responses were analyzed to determine whether the Likert scale items captured a range of opinions. Data from the pilot test were analyzed using SPSS (IBM Version 24). The Cronbach's alpha coefficient for each section exceeded 0.7 (see Appendix A), indicating good internal consistency.[43] Based on participant feedback, minor wording adjustments were made to enhance clarity. No major revisions were required, confirming the questionnaire's suitability for the main study.

Data Collection

Hospital administrators were contacted via email, and approval was sought to distribute the survey within their hospital networks. Participation was voluntary, and no incentives were offered to minimize response bias. The survey was created using Google Forms and distributed through hospital Email lists and professional healthcare groups on social media platforms such as WhatsApp and LinkedIn. This multi-channel approach was adopted to ensure maximum outreach and accessibility, particularly for healthcare workers with demanding schedules. The survey remained open for four weeks, during which 421 responses were received. After removing incomplete responses (n = 38), a final sample of 383 valid responses was retained for analysis.

Data Analysis

To attain the objectives of the research, the researcher utilized the statistical package for the Social Sciences (SPSS, IBM Version 24) for analyzing the data. Descriptive statistics were used to characterize the participants' demographic data. In addition, two-sample *t*-test with unequal variances, and single factor ANOVA were used for analyzing the data.

Ethics-Related Factors

The study received approval from the Institutional Review Board at Imam Abdulrahman Bin Faisal University (IRB-2024-14-167). The data collection and analysis procedure were carried out in compliance with all relevant ethical norms. All details regarding the investigation's objective and the complete disclosure of the participants' legal rights were provided. Prior to the survey, all respondents provided their informed consent, and participation was entirely voluntary.

Results

The demographic data from Table 1 highlights the diverse composition of participants in the survey. Predominantly, individuals aged 18 to 30 years constitute the largest proportion, with females representing a majority of the sample. Staff Nurses emerge as the most prevalent professional role, closely followed by Physicians. Participants' experience levels are evenly distributed across different tenure categories, while the majority work in public healthcare settings. This demographic snapshot lays the groundwork for a nuanced analysis of healthcare workers' perspectives, offering valuable insights into the challenges and opportunities within the surveyed population.

The data from Table 2 provides insights into the perceived challenges within Saudi Arabia's healthcare system concerning the realization of Vision 2030. Across various domains, healthcare professionals expressed notable concerns. Capacity and infrastructure, alongside the workforce, emerged as the most pressing challenges, with mean scores of 3.61 and 3.63, respectively, indicating a shared recognition of these obstacles. Digital transformation, although significant, garnered a slightly lower mean score of 3.35. Preventive healthcare and public awareness and education were identified as comparatively less challenging, with mean scores of 2.81 and 3.11, respectively. However, challenges such as coordination and integration, healthcare financing, quality of care, and disease prevention and control scored moderately high, emphasizing the multifaceted nature of the obstacles facing the healthcare system. The standard deviations accompanying these mean scores suggest a moderate level of agreement among participants, indicating some variability in perceptions within each challenge category. This analysis underscores the complexity of addressing healthcare system challenges and highlights areas warranting strategic focus and intervention to align with the objectives of Vision 2030.

Table 1 Participants Demographics

Variable	Groups	N	Relative Frequency
Age (in years)	18–30	218	56.9%
	31–40	73	19.1%
	41–50	51	13.3%
	51–60	37	9.7%
	>60	4	1%
Gender	Male	148	38.6%
	Female	235	61.4%
Role	Physician	102	26.6%
	Specialist physician	32	8.4%
	Staff Nurse	150	39.2%
	Nurse Manager	62	16.2%
	Administration/manager	37	9.7%
Experience	1–3 years	118	30.8%
	4–6 years	112	29.2%
	7–9 years	59	15.4%
	>9 years	94	24.5%
Working Hospital	Public	230	60.1%
	Private	153	39.9%

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Table 2 Healthcare System Challenges Affecting the Saudi Vision 2030

Challenges	Mean	SD
Capacity and Infrastructure	3.61	0.75
Workforce	3.63	0.76
Digital transformation	3.35	1.04
Preventive healthcare	2.81	0.83
Coordination and integration	3.41	0.93
Healthcare financing	3.29	0.89
Public awareness and education	3.11	1.27
Quality of care	3.32	0.80
Disease prevention and control	3.45	1.28

Abbreviation: SD, Standard Deviation.

The ANOVA results from Table 3 reveal notable variations in participants' perceptions of healthcare system challenges based on their professional roles. Across several domains, including Capacity and Infrastructure, Digital Transformation, Public Awareness and Education, and Disease Prevention and Control, statistically significant differences ($p < 0.05$) are observed among different roles within the healthcare sector. For instance, physicians and specialist

Table 3 ANOVA Results Assessing Differences Between Participants Perceptions Based on Their Roles

Challenges	Roles	Mean	Variance	p-value
Capacity and Infrastructure	Physician	3.75	0.59	0.0053*
	Specialist physician	3.94	0.71	
	Nurse	3.57	0.46	
	Nurse manager	3.46	0.66	
	Admin/Manager	3.43	0.43	
Workforce	Physician	3.64	0.47	0.4158
	Specialist physician	3.70	0.40	
	Nurse	3.69	0.64	
	Nurse manager	3.48	0.59	
	Admin/Manager	3.56	0.70	
Digital transformation	Physician	3.63	0.96	< 0.0001*
	Specialist physician	3.88	0.68	
	Nurse	3.20	1.19	
	Nurse manager	3.16	0.94	
	Admin/Manager	3.06	1.09	

(*Continued*)

Table 3 (Continued).

Challenges	Roles	Mean	Variance	p-value
Preventive healthcare	Physician	2.86	0.76	0.9351
	Specialist physician	2.72	0.80	
	Nurse	2.81	0.76	
	Nurse manager	2.78	0.43	
	Admin/Manager	2.79	0.60	
Coordination and integration	Physician	3.46	0.97	0.8436
	Specialist physician	3.28	0.67	
	Nurse	3.45	0.77	
	Nurse manager	3.35	1.06	
	Admin/Manager	3.39	0.95	
Healthcare financing	Physician	3.36	0.89	0.4791
	Specialist physician	3.42	1.23	
	Nurse	3.23	0.76	
	Nurse manager	3.38	0.66	
	Admin/Manager	3.15	0.57	
Public awareness and education	Physician	3.59	0.71	< 0.0001*
	Specialist physician	3.93	0.83	
	Nurse	2.77	1.89	
	Nurse manager	2.77	1.63	
	Admin/Manager	3.07	1.90	
Quality of care	Physician	3.37	0.83	0.7604
	Specialist physician	3.26	0.55	
	Nurse	3.26	0.66	
	Nurse manager	3.39	0.54	
	Admin/Manager	3.35	0.39	
Disease prevention and control	Physician	4.02	0.61	< 0.0001*
	Specialist physician	4.09	0.68	
	Nurse	3.20	1.96	
	Nurse manager	2.89	1.71	
	Admin/Manager	3.24	2.23	

Notes: *Statistically significant difference.

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physicians tend to perceive challenges related to Digital Transformation and Disease Prevention and Control more acutely compared to nurses and administrators. Conversely, the challenge of Preventive Healthcare appears to be perceived uniformly across roles, with no significant differences noted.

The ANOVA results from Table 4 unveil distinct variations in participants' perceptions of healthcare system challenges based on their work experience levels. Notably, significant differences ($p < 0.05$) emerge in several domains, shedding light on the nuanced perspectives of healthcare professionals at different stages of their careers. For instance, individuals with 1–3 years of experience perceive challenges related to Digital Transformation, Preventive Healthcare, Coordination and Integration, Healthcare Financing, Public Awareness and Education, Quality of Care, and Disease Prevention and Control differently compared to their more experienced counterparts. Particularly, those with fewer years of experience tend to rate these challenges less significantly, suggesting a potential gap in awareness or exposure to the

Table 4 ANOVA Results Assessing Differences Between Participants Perceptions Based on Their Work Experience

Challenges	Experience	Mean	Variance	p-value
Capacity and Infrastructure	1–3 years	3.51	0.49	0.1698
	4–6 years	3.71	0.63	
	7–9 years	3.69	0.37	
	> 9 years	3.59	0.67	
Workforce	1–3 years	3.49	0.63	0.0874
	4–6 years	3.74	0.61	
	7–9 years	3.69	0.40	
	> 9 years	3.64	0.55	
Digital transformation	1–3 years	3.08	1.08	0.0091*
	4–6 years	3.47	1.14	
	7–9 years	3.45	1.02	
	> 9 years	3.49	1.00	
Preventive healthcare	1–3 years	2.60	0.40	0.0071*
	4–6 years	2.89	0.80	
	7–9 years	2.82	0.76	
	> 9 years	2.96	0.81	
Coordination and integration	1–3 years	3.36	0.79	0.0052*
	4–6 years	3.67	0.91	
	7–9 years	3.23	1.07	
	> 9 years	3.29	0.72	
Healthcare financing	1–3 years	3.08	0.53	0.0145*
	4–6 years	3.38	1.01	
	7–9 years	3.46	0.65	
	> 9 years	3.37	0.91	

(*Continued*)

Table 4 (Continued).

Challenges	Experience	Mean	Variance	p-value
Public awareness and education	1–3 years	2.74	1.92	0.0019*
	4–6 years	3.29	1.43	
	7–9 years	3.30	1.16	
	> 9 years	3.26	1.52	
Quality of care	1–3 years	3.17	0.46	0.0108*
	4–6 years	3.50	0.86	
	7–9 years	3.41	0.63	
	> 9 years	3.24	0.58	
Disease prevention and control	1–3 years	3.12	1.83	0.0062*
	4–6 years	3.65	1.57	
	7–9 years	3.67	1.35	
	> 9 years	3.48	1.60	

Notes: * Statistically significant difference.

complexities inherent in these domains. Conversely, as experience increases, perceptions of these challenges become more pronounced, potentially reflecting a deeper understanding acquired through years of practice and exposure to healthcare system dynamics. These findings underscore the importance of considering work experience as a factor in addressing healthcare system challenges effectively and tailoring interventions and training programs accordingly to foster a more informed and resilient healthcare workforce.

Table 5 illustrates the outcomes of *t*-test analyses investigating disparities in participants' perceptions of healthcare system challenges based on gender. Significantly divergent perceptions ($p < 0.05$) between male and female participants

Table 5 *T*-Test Results Assessing Differences Between Participants Perceptions Based on Their Gender

Challenges	Gender	Mean	Variance	p-value
Capacity and Infrastructure	Male	3.70	0.59	0.0829
	Female	3.56	0.54	
Workforce	Male	3.62	0.56	0.7903
	Female	3.64	0.59	
Digital transformation	Male	3.61	1.00	0.0001*
	Female	3.19	1.08	
Preventive healthcare	Male	2.88	0.84	0.1913
	Female	2.76	0.59	
Coordination and integration	Male	3.42	0.85	0.8907
	Female	3.41	0.89	

(*Continued*)

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Table 5 (Continued).

Challenges	Gender	Mean	Variance	p-value
Healthcare financing	Male	3.37	0.89	0.2162
	Female	3.25	0.74	
Public awareness and education	Male	3.55	1.05	< 0.0001*
	Female	2.84	1.77	
Quality of care	Male	3.37	0.68	0.3009
	Female	3.29	0.62	
Disease prevention and control	Male	3.87	1.09	< 0.0001*
	Female	3.18	1.85	

Notes: * Statistically significant difference.

are observed in several domains. Particularly noteworthy are the differences in perceptions of Digital Transformation, Public Awareness and Education, and Disease Prevention and Control. Males tend to rate these challenges higher compared to females, suggesting potential variations in the recognition of the importance and impact of digital transformation initiatives, public health education efforts, and disease prevention strategies.

Table 6 presents *t*-test results revealing significant differences in participants' perceptions of healthcare system challenges based on their working hospital (public or private). Across multiple domains, including Capacity and Infrastructure, Workforce, Preventive Healthcare, Coordination and Integration, Healthcare Financing, and Quality of Care, disparities are notable Employees in private hospitals generally perceive higher challenges in Capacity and Infrastructure, Workforce, Digital Transformation, and Public Awareness and Education compared to those in public hospitals, suggesting potential differences in resource allocation, infrastructure development, and organizational priorities between the two sectors. Conversely, participants in public hospitals express greater challenges in Preventive Healthcare, Coordination and Integration, Healthcare Financing, and Quality of Care, pointing to potential disparities in preventive care practices, care coordination efforts, financial resources, and quality improvement initiatives.

Table 6 *T*-Test Results Assessing Differences Between Participants Perceptions Based on Their Working Hospital

Challenges	Working Hospital	Mean	Variance	p-value
Capacity and Infrastructure	Public	3.24	0.29	< 0.0001*
	Private	4.18	0.44	
Workforce	Public	3.24	0.46	< 0.0001*
	Private	4.22	0.18	
Digital transformation	Public	3.26	1.08	0.0364*
	Private	3.49	1.08	
Preventive healthcare	Public	2.66	0.57	< 0.0001*
	Private	3.03	0.78	
Coordination and integration	Public	3.04	0.70	< 0.0001*
	Private	3.98	0.60	

(*Continued*)

Table 6 (Continued).

Challenges	Working Hospital	Mean	Variance	p-value
Healthcare financing	Public	2.92	0.41	< 0.0001*
	Private	3.86	0.84	
Public awareness and education	Public	3.02	1.57	< 0.0861
	Private	3.25	1.66	
Quality of care	Public	3.13	0.34	<0.0001*
	Private	3.61	0.98	
Disease prevention and control	Public	3.38	1.63	0.2128
	Private	3.55	1.71	

Notes: * Statistically significant difference.

These findings underscore the need for tailored interventions and resource allocation strategies to address sector-specific challenges and promote equitable healthcare delivery across public and private settings.

Discussion

The empirical study presented here offers valuable insights into the challenges facing the healthcare systems in Saudi Arabia as they strive to align with the ambitious objectives outlined in Vision 2030. The discussion of the results will critically analyze the findings in the current context of healthcare challenges in Saudi Arabia and their impact on the realization of Vision 2030.

Capacity and Infrastructure

The perceived challenges in capacity and infrastructure underscore the need for significant investments to meet the growing demands of the population and enhance healthcare accessibility, particularly in underserved regions. Previous studies, such as those referenced,[3–6] have highlighted the importance of strategic planning and investment in healthcare infrastructure to address regional disparities and enhance accessibility. The stark disparity between public and private hospitals suggests the presence of systemic inequalities in resource allocation, which could hinder the equitable provision of healthcare services across the Kingdom. Addressing these challenges requires strategic planning, infrastructure development initiatives, and policy reforms to ensure that all citizens have access to quality healthcare facilities.

Workforce

The workforce shortage highlighted in the study poses a critical impediment to the delivery of quality care and aligning with Vision 2030's goals. The workforce shortage identified in the empirical study aligns with existing research highlighting challenges related to recruitment, retention, and skill development.[7] The significant differences observed between public and private hospitals indicate varying levels of workforce satisfaction and resource allocation practices. Efforts to address these challenges should focus on comprehensive workforce planning, recruitment, and retention strategies, along with continuous training and skill development programs to enhance the capacity and competency of healthcare professionals.

Digital Transformation

The challenges associated with digital transformation, including concerns related to data privacy and interoperability, have been well-documented in the literature.[9–11] While digital transformation presents opportunities for improving healthcare efficiency and patient outcomes, the study reveals notable challenges, particularly in public hospitals. Addressing concerns related to data privacy, interoperability, and digital literacy is essential to realizing the full potential of digital health solutions. Robust training programs and investment in digital infrastructure are crucial for successful adoption and integration of technology into healthcare delivery systems.

Preventive Healthcare and Public Awareness

While preventive healthcare and public awareness were perceived as relatively less challenging in the current study, previous research has highlighted barriers related to cultural beliefs, socioeconomic factors, and health disparities.[24–26] Despite the relatively lower perceived challenges in preventive healthcare and public awareness, the study highlights the need for targeted interventions to promote healthy behaviors, early disease detection, and community-based health education initiatives. Overcoming cultural barriers, increasing health literacy, and addressing socioeconomic disparities are essential for fostering a culture of prevention and improving population health outcomes.

Coordination and Integration

The challenges in coordination and integration identified in the empirical study mirror concerns raised in previous research regarding fragmentation and inefficiencies within healthcare systems.[27–29] Enhancing collaboration among healthcare providers, standardizing protocols, and implementing interoperable health information systems are essential for achieving seamless coordination across the continuum of care.

Healthcare Financing

Sustainable healthcare financing remains a persistent challenge, as highlighted in the empirical study and previous research.[30–32] The disparities between public and private hospitals reflect differing financial models and resource allocation practices. Innovative financing mechanisms, such as value-based payment models and public-private partnerships, are necessary to ensure equitable access to quality care while promoting fiscal responsibility.

Quality of Care and Disease Prevention

Variability in clinical practices and challenges in quality improvement initiatives resonate with findings from previous studies,[36–41] underscore the need for robust quality improvement initiatives and evidence-based practices. Strengthening public health infrastructure and surveillance systems is critical for effective disease prevention and control, particularly in the face of emerging health threats and infectious diseases.

Gender and Work Experience Differences

The study's findings regarding gender and work experience differences highlight the importance of considering diverse perspectives within the healthcare workforce. Tailoring interventions and training programs to address the specific needs and challenges faced by different demographic groups are essential for fostering a more inclusive and resilient healthcare workforce.

Theoretical Implications

This study contributes to theoretical advancements in healthcare system transformation, particularly in understanding the intersections between workforce shortages, infrastructure challenges, digital health adoption, and healthcare financing. The findings align with human capital theory, which emphasizes the importance of continuous training and skill development to improve workforce efficiency. The study provides empirical evidence supporting the need for investment in healthcare professionals, reinforcing previous research suggesting that training programs and workforce retention strategies are critical for sustainable healthcare development. The study also extends resource-based theory, demonstrating how limitations in infrastructure, technology, and workforce capacity constrain organizational performance and patient outcomes. Additionally, the research contributes to technology acceptance models (TAM and UTAUT) by highlighting barriers to digital transformation, particularly data privacy concerns, resistance to technology, and inadequate training. The study supports prior findings that technological advancements must be accompanied by structured digital literacy programs to ensure successful adoption. From a systems theory perspective, the study illustrates how fragmented healthcare coordination leads to inefficiencies. The results underscore the need for integrated healthcare models that promote cross-sector collaboration and standardized protocols to improve service delivery.

Managerial Implications

The findings offer practical recommendations for healthcare administrators, policymakers, and decision-makers in Saudi Arabia's healthcare sector. Given that workforce shortages emerged as the most critical challenge, healthcare organizations should implement comprehensive recruitment, retention, and professional development programs. Findings indicate that workforce shortages directly contribute to increased workload and burnout, leading to lower quality of care. Incentive structures, career progression pathways, and continuous training initiatives can mitigate these issues and enhance job satisfaction. The study highlights significant barriers to digital transformation, particularly concerns about data security and limited training on digital tools. Targeted digital literacy programs and cybersecurity frameworks are essential for successful EHR integration and AI-driven healthcare solutions. Policymakers should focus on hospital-wide digital transformation strategies that prioritize usability and data protection. Public hospitals reported greater concerns regarding infrastructure limitations, suggesting an urgent need for facility expansion, equipment upgrades, and optimized resource distribution. Strategic public-private partnerships (PPPs) could enhance funding allocation and improve healthcare accessibility in underserved regions. Private hospitals identified financial constraints as a significant barrier, indicating a need for alternative financing mechanisms such as value-based care models, performance-based funding, and increased government support for digital health investments. Sustainable financing solutions can ensure long-term healthcare system resilience and equity. The study's findings reinforce the need for better coordination across healthcare institutions, as fragmented communication leads to inefficiencies and patient care delays. Implementing standardized care protocols, interoperable health records, and cross-sector collaborations will improve service continuity and overall system efficiency.

Limitations and Future Research Recommendations

Limitations of the study include potential biases inherent in self-reported data, as participants' perceptions may be influenced by personal experiences and perspectives. The cross-sectional design limits the ability to infer causality or temporal relationships between variables. The study's focus on healthcare workers may overlook perspectives from other key stakeholders, such as patients and policymakers. Additionally, the sample size and composition, drawn primarily from public and private hospitals, may not fully represent the diversity of healthcare settings in Saudi Arabia. Future research could address these limitations by incorporating longitudinal designs, triangulating data sources, and expanding the scope of stakeholders involved.

Conclusion

This study provides empirical insights into the critical challenges facing Saudi Arabia's healthcare system in achieving Vision 2030 objectives, highlighting workforce shortages, infrastructure limitations, digital transformation barriers, and financial constraints as key obstacles. Findings reveal sectoral differences, with public hospitals struggling with infrastructure and workforce shortages, while private hospitals face financial and digital adoption challenges. The study extends human capital theory, resource-based theory, and technology acceptance models, offering a multi-dimensional framework for healthcare transformation. Practical recommendations include targeted workforce planning, investment in digital health solutions, improved infrastructure, and sustainable financing models. While the findings provide valuable policy insights, future research should explore longitudinal healthcare system changes and expand the sample to include primary care and community health professionals. Addressing these challenges will enhance efficiency, accessibility, and resilience, ensuring Saudi Arabia's healthcare sector successfully aligns with Vision 2030's long-term goals.

Data Sharing Statement

Data is available upon request from the corresponding author.

Ethics Statement

Ethical approval was obtained from Institutional Review Board at Imam Abdulrahman bin Faisal University (IRB-2024-14-167). Ethical practices were adopted in accordance with the Declaration of Helsinki.

Disclosure

The authors report no conflicts of interest in this work.

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