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Healthcare Professionals' Readiness for Artificial Intelligence Applications in Healthcare Institutions in Oman

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Abstract

Background: *Artificial intelligence (AI), the simulation of human intelligence by computer systems, is increasingly being integrated into healthcare to support diagnosis, treatment planning, prognosis, and patient care. Several Gulf Cooperation Council (GCC) countries have incorporated AI into their national healthcare strategies. The successful implementation of AI in healthcare depends largely on healthcare professionals' knowledge, attitudes, and readiness. This study aimed to assess these factors among healthcare professionals in Oman.* ***Methods:*** *A quantitative cross-sectional study was conducted in the North Batinah Governorate (NBG), Oman, among healthcare professionals employed in the Ministry of Health (MOH) institutions. Data was collected at a single point in time using convenience sampling and a self-administered questionnaire. Statistical analyses were performed using SPSS.* ***Results:*** *A total of 470 healthcare professionals participated. The majority of participants were female (96%), aged 25–35 years (66%), and nurses (61%). Overall, participants demonstrated moderate knowledge of AI (mean = 56%), positive attitudes (mean = 3.3 ±0.7), and moderate readiness (mean = 3.0 ±1.2). Readiness varied significantly by age, marital status, and professional role, with midwives showing the highest preparedness. The multivariate regression model explained only 2.6% of readiness variance and was not statistically significant overall ($p = 0.140$). However, professional role remained a significant independent predictor ($p = 0.011$).* ***Conclusion:*** *Healthcare professionals in the NBG demonstrated moderate levels of knowledge, attitudes, and readiness regarding AI applications. Addressing these gaps is essential for effective AI integration. The findings provide foundational evidence to support policy development and inform targeted strategies aimed at enhancing AI adoption in healthcare, ultimately contributing to improved patient outcomes in Oman.*

Keywords: **Artificial Intelligence, Knowledge, Attitudes, Readiness, Healthcare Professionals, Oman.**

1. Introduction

Artificial intelligence (AI) refers to computer systems capable of performing tasks that traditionally required human intelligence. Within healthcare, AI is advancing rapidly through machine learning (ML) and deep learning (DL), which enable the analysis of large datasets, pattern recognition, and clinical decision support (Benjamens et al., 2020; Ronquillo et al., 2021). Applications range from monitoring medication adherence and streamlining workflows to reducing waiting times (Labovitz et al., 2017). In nursing practice, predictive analytics, natural language processing, and decision-support tools are increasingly used to deliver individualized, data-driven care (Topaz et al., 2019; Hannaford et al., 2021). Importantly, research on the clinical use of AI must be distinguished from technological development studies (O'Connor, 2021).

1.1 Literature Review

Globally, studies report varied levels of knowledge, attitudes, and readiness toward AI among healthcare professionals (HCPs). While systematic reviews highlight generally positive attitudes, persistent gaps in technical knowledge and preparedness remain (Tran et al., 2022). For example, only 30% of nurses in the United States reported adequate knowledge of AI, with most demonstrating insufficient understanding (Swan, 2021). Adoption challenges also exist. Resistance has been linked to limited familiarity, lack of trust, and ethical concerns (Kelly et al., 2019; Blease et al., 2018; Oh et al., 2019). Nonetheless, evidence suggests that effective integration can reduce routine workload and allow HCPs to focus on complex decision-making (Sarwar et al., 2019; Drogt et al., 2022). Structured training and organizational support are therefore essential to foster balanced understanding of AI's potential and limitations (Masters, 2020).

Regionally, studies in the Gulf Cooperation Council (GCC) show moderate readiness. In Saudi Arabia, HCPs expressed openness toward AI but emphasized the need for training and institutional support (Alshammari et al., 2023). Similarly, clinicians in the United Kingdom reported receptivity but raised concerns over privacy, accountability, and professional autonomy (Smith et al., 2021), issues also relevant in the GCC context.

In Oman, digital transformation began with the introduction of electronic health records in 2008, generating vast health data and aligning with Oman Vision 2040's digital health priorities. Despite these advances, evidence indicates limited awareness and preparedness for AI among practicing HCPs. While studies in other countries have examined medical students' awareness (Ejaz et al., 2020; Sit et al., 2020), there remains little empirical research on practicing professionals in Oman. Addressing this gap is vital to inform national strategies, guide capacity-building, and enable effective AI integration into healthcare delivery.

1.2 Research Questions

- What is the level of knowledge of HCPs regarding AI applications in healthcare institutions in NBG?
- What are the attitudes of HCPs toward AI applications in NBG?
- To what extent are HCPs ready to apply AI applications in NBG?

1.3Aim of the Study

To examine the knowledge, attitudes, and readiness of HCPs regarding AI applications within healthcare institutions in NBG, Oman.

1.4 Objectives of the Study

- To measure the level of knowledge of HCPs regarding AI applications in NBG.
- To explore the attitudes of HCPs toward AI applications in NBG.
- To evaluate the readiness of HCPs for adopting AI applications in NBG.

2. Methodology

2.1 Ethical Considerations

Ethical approval for this study was obtained from the Ministry of Health (MOH) Research and Ethical Review and Approval Committee, Sultanate of Oman (RERAC 61/2024). Prior to initiating the study, the research team presented the study design and objectives to administrative personnel in selected primary and secondary healthcare institutions within the NBG. This step was essential to obtain institutional permissions, secure logistical support, and establish the credibility and legitimacy of the study. Following ethical approval, formal authorization was sought from the participating healthcare institutions to facilitate recruitment of HCPs. Once administrative procedures were completed, HCPs were invited to participate in the study. Data collection was conducted via an electronic questionnaire, which included an informed consent form on the first page. Participants were required to indicate their consent by selecting the "agree to participate" option before proceeding. Participation was entirely

voluntary and anonymous. No identifiable personal data were collected. All data were treated as confidential and securely stored on password-protected computers accessible only to members of the research team.

2.2 Research Strategy

This study adopted a non-experimental, quantitative, exploratory cross-sectional design and employed a convenience sampling technique. Data were collected at a single point in time. The study was conducted in NBG, Oman, and targeted HCPs, including physicians, nurses, and midwives employed in healthcare institutions. A total of 470 HCPs participated.

2.3 Inclusion and Exclusion Criteria

Inclusion Criteria:

- Omani HCPs, including physicians, nurses, and midwives.
- Currently employed in primary and secondary healthcare institutions within NBG.

Exclusion Criteria:

- Non-Omani HCPs.
- HCPs employed outside NBG in other governorates.

2.4 Data Collection

Data were collected using a structured, self-administered questionnaire in English, adapted from previously published instruments. The questionnaire was distributed electronically via a mobile link shared with participating HCPs. It comprised four sections: (1) demographic information, (2) knowledge of AI applications in healthcare, (3) attitudes toward AI applications, and (4) readiness for AI integration in clinical practice. The questionnaire contained 36 closed-ended items distributed as follows: six items on demographics, 12 on knowledge, seven on attitudes, and 11 on readiness. Knowledge items were scored using Yes/No responses, while the attitude and readiness items employed a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The average completion time was 8–10 minutes.

A pilot test was conducted prior to the main study to assess reliability and validity. Internal consistency was measured, and Cronbach's alpha values for all sections exceeded 0.78, indicating acceptable reliability. Test–retest reliability was also evaluated with a subsample of 25 HCPs from primary healthcare institutions. Content validity was assessed by three MOH experts selected for their expertise and experience in AI applications in healthcare. After obtaining their consent, the research team provided a content validation form aligned with the LYNN method (Rutherford-Hemming, 2015). Item-level content validity indices (I-CVI) were calculated using Microsoft Excel, and items with scores above 0.78 were retained in the final tool. Following the main data collection, Cronbach's alpha was recalculated to confirm internal consistency. Additionally, item-to-item and item-to-total correlations were examined to ensure measurement reliability across all sections of the instrument.

2.5 Data Analysis

Data were initially coded and organized using Microsoft Excel, then imported into the Statistical Package for Social Sciences (SPSS), version 30.0, for analysis. Descriptive statistics, including means, medians, frequencies, and percentages, were used to summarize demographic characteristics and study variables. To identify factors associated with readiness for AI applications in healthcare, binary logistic regression analysis was performed. This allowed for examination of the influence of multiple independent variables, including knowledge, attitudes, and sociodemographic characteristics, on participants' readiness to adopt AI in clinical practice.

3. Result

3.1 Participants' Sociodemographic Characteristics

The mjority of participants (66%) were aged between 25 and 35 years. Most were female (96%) and married (77%), and 65% had attained higher education qualifications. With respect to professional roles, nurses represented the largest group (61%), followed by midwives (21%) and physicians (19%). Additionally, 69% of participants reported having five or more years of work experience (Table 1).

Table 1: Participants' Sociodemographic Data

Characteristics		Frequency	Percent
Age	< 25 Yrs.	8	2%
	25-35 Yrs.	312	66%
	36-45 Yrs.	127	27%
	>45 Yrs.	23	5%
Gender	Male	20	4%
	Female	450	96%
Marital Status	Single	86	18%
	Married	363	77%
	Divorced	16	3%
	Widow	5	1%
Educational Level	Diploma	163	35%
	Bachelor	296	63%
	Master	10	2%
	PhD	1	0%
Years of Experience	< 5 Yrs.	146	31%
	5-10 Yrs.	122	26%
	11-20 Yrs.	116	25%
	> 20 Yrs.	86	18%
HCP's Role	Nurses	285	61%
	Midwives	97	21%
	Doctors	88	19%
Total		**470**	**100%**

3.2 Knowledge of AI Applications in Healthcare

Participants' knowledge of AI applications in healthcare was assessed using 11 items (Table 2). The proportion of correct responses per item ranged from 41% to 82%, with an overall mean knowledge score of 56% (±23%). As illustrated in Figure 1, participants were categorized into three knowledge levels based on the number of correct responses: low (0–3 correct responses, 16%), moderate (4–7 correct responses, 49%), and high (8–11 correct responses, 35%).

Items related to AI terminology yielded the highest proportions of correct responses. In contrast, items addressing the practical use of AI, specifically its application by HCPs (Item 9) and within participants' professional fields (Item 11), received the lowest correct response rates. Among participants who demonstrated knowledgeable responses to Item 11 (n = 198), more than half (55%) reported not attending any talks or reading any papers on AI use in clinical decision-making during the past year. By comparison, 39% engaged with one to five such resources, and only 6% reported accessing more than five (Figure 2).

Table 2: Knowledge about AI Applications in Healthcare

No	Knowledge about AI Applications in Healthcare	Knowledge (Freq.)		Knowledge (%)	
		Yes	No	Mean	SD
1	I know the term "artificial intelligence".	384	86	82%	39%
2	I know the term "machine learning".	282	188	60%	49%
3	I know the term "neural network".	161	309	34%	48%
4	I know the term "deep learning".	309	161	66%	48%
5	I have heard about AI before but did not realize it has applications to my specialty.	275	195	59%	49%
6	I know of research applications of AI in my field, but I did not think it will reach clinical practice.	309	161	66%	48%
7	I understand that AI is a new and emerging tool in my field.	318	152	68%	47%
8	I have experimented with programs that use AI to carry out specific tasks in my field.	216	254	46%	50%
9	I routinely use AI in my clinical practice to carry out specific tasks.	192	278	41%	49%
10	I know that AI will replace the task of HCP to provide patients with certain tasks or care.	250	220	53%	50%
11	I know that AI applications are used within my field.	198	272	42%	49%
Overall Knowledge				**56%**	**23%**

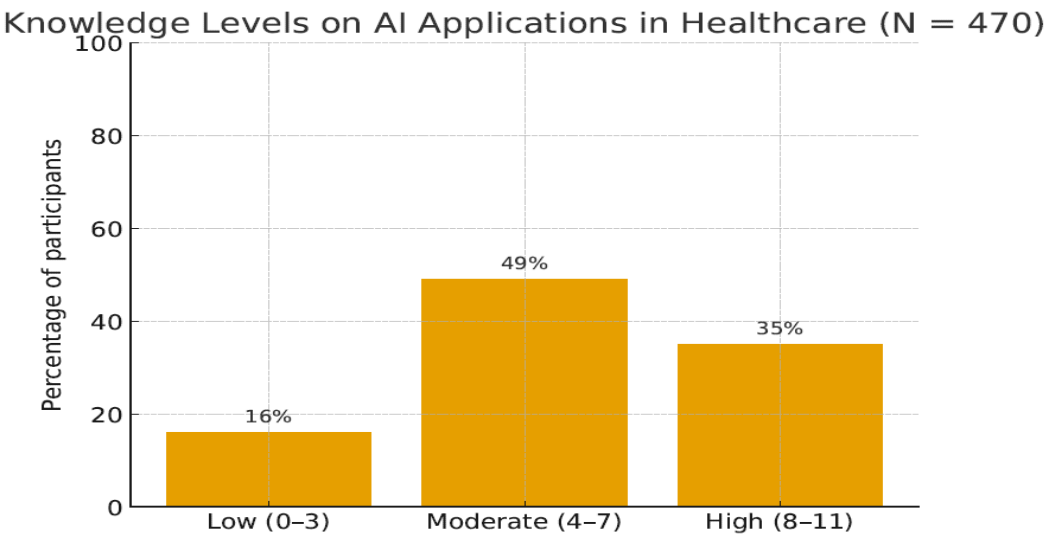

Figure 1: Knowledge Level of AI Applications in Healthcare

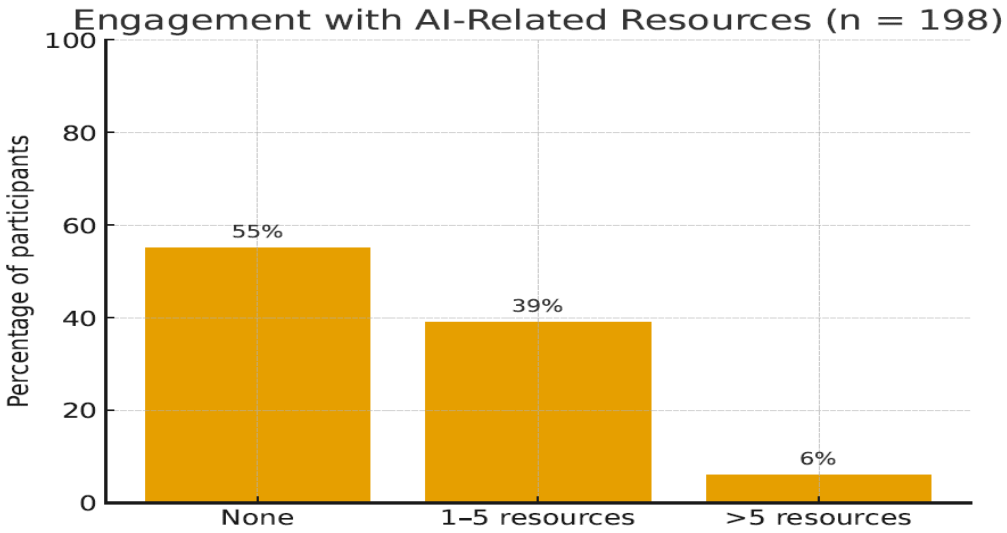

Figure 2: Knowledge Level of AI Applications in Healthcare

3.3 Attitudes toward AI Applications in Healthcare

Attitudes toward AI applications were assessed using a 7-item scale, with responses rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) (Table 3). The overall mean attitude score was 3.3 (±0.7), with individual item means ranging from 3.1 to 3.5.

The item addressing concerns about potential negative consequences of AI on healthcare practice (Item 4) yielded the lowest mean score (3.1 ±1.0), reflecting comparatively greater apprehension in this area relative to other attitude items.

Table 3: Attitude towards AI Applications in Healthcare

No	Attitude towards AI Applications	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Descriptive	
							Mean	SD
1	I believe that AI plays an important role in healthcare.	6%	7%	26%	51%	10%	3.5	1.0
2	I believe that AI will take place in many healthcare applications and practices.	7%	7%	19%	63%	4%	3.5	0.9
3	I believe that AI will threaten/ disrupt the healthcare practice.	1%	21%	36%	31%	11%	3.3	1.0
4	I believe that AI will threaten/ disrupt some healthcare careers.	6%	24%	33%	31%	6%	3.1	1.0
5	I believe that AI has no limitations in my work.	1%	23%	28%	45%	3%	3.3	0.9
6	I believe that AI will affect HCP efficiency.	6%	11%	31%	47%	5%	3.3	1.0
7	I feel comfortable using AI tools in my practice.	6%	10%	35%	45%	3%	3.3	0.9
Overall Attitude							**3.3**	**0.7**

3.4 Readiness of HCPs for AI Applications in Healthcare

Readiness for AI applications was assessed using an 11-item scale, with responses rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) (Table 4). The overall mean readiness score was 3.0 (±1.2), with item-specific means ranging from 2.9 to 3.2.

The highest-rated item (Item 4) evaluated participants' readiness to access, evaluate, use, share, and generate new knowledge through information and communication technologies, with a mean score of 3.2 (±1.3).

Table 4: Readiness of HCPs on AI Applications in Healthcare

No	Readiness of HCPs on AI Applications	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree	Descriptive	
							Mean	SD
1	I am ready to use AI-based information in combination with my professional knowledge.	21%	13%	13%	49%	4%	3.0	1.3
2	I am ready to use AI technologies effectively and efficiently in healthcare delivery.	24%	10%	12%	51%	3%	3.0	1.3

3	I am ready to use AI applications in accordance with their purpose.	21%	12%	17%	48%	3%	3.0	1.2
4	I am ready to access, evaluate, use, share and create new knowledge using information and communication technologies.	19%	12%	10%	52%	8%	3.2	1.3
5	I am ready to explain how AI applications in healthcare offer a solution to which problem.	21%	12%	22%	44%	1%	2.9	1.2
6	I am ready to use AI for education, service and research purposes.	21%	14%	10%	51%	4%	3.0	1.3
7	I am ready to explain the AI applications used in healthcare services to the patient.	20%	16%	19%	44%	1%	2.9	1.2
8	I am ready to choose the proper AI application for the problem encountered in healthcare.	22%	13%	13%	52%	1%	3.0	1.3
9	I can foresee the opportunities and threats that AI technology can create.	19%	16%	17%	47%	1%	3.0	1.2
10	I can act in accordance with ethical principles while using AI technologies.	19%	14%	16%	48%	3%	3.0	1.2
11	I can follow the legal regulations regarding the use of AI technologies in healthcare.	19%	12%	18%	50%	1%	3.0	1.2
Overall Readiness							**3.0**	**1.2**

3.5 Readiness by Knowledge, Attitude, and Sociodemographic Characteristics

Readiness for AI applications in healthcare varied significantly by age, marital status, and professional role (Table 5). HCPs aged 36 years and above reported higher readiness levels (mean = 3.2 ±1.2) compared to those aged 35 years or younger (mean = 2.9 ±1.2; $p = 0.009$). Marital status was also significantly associated with readiness, with married or previously married participants demonstrating greater preparedness (mean = 3.1 ±1.2) than single participants (mean = 2.7 ±1.3). With respect to professional role, midwives reported the highest readiness scores (mean = 3.3 ±1.1), followed by physicians (mean = 3.1 ±1.1), and nurses (mean = 2.8 ±1.2). In contrast, no statistically significant associations were observed between readiness and participants' knowledge or attitude scores.

Table 5: Readiness by Knowledge, Attitude, and Sociodemographic Characteristics

Readiness by Knowledge, Attitude, and Sociodemographic Characteristics		N	READINESS		
			Mean	SD	Sig.
Age	≤ 35 Yrs.	320	2.9	1.2	0.009
	≥ 36 Yrs.	150	3.2	1.2	

Gender	Male	20	3.1	0.9	0.582
	Female	450	3.0	1.2	
Marital Status	Single	86	2.7	1.3	0.004
	Married (Or divorced, widow)	384	3.1	1.2	
Educational Level	Diploma	163	3.1	1.1	0.132
	Higher education	307	2.9	1.2	
Years of Experience	< 5 Yrs.	146	3.0	1.2	0.78
	5-10 Yrs.	122	3.1	1.1	
	11-20 Yrs.	116	2.9	1.2	
	> 20 Yrs.	86	3.0	1.2	
HCP's Role	Nurses	285	2.8	1.2	0.002
	Midwives	97	3.3	1.1	
	Doctors	88	3.1	1.1	
Knowledge (%)	**Correlation Coefficient**		**0.019**		**0.677**
Attitude	**Correlation Coefficient**		**0.043**		**0.350**

3.6 Adjusted Regression Model of Readiness Predictors

A multivariate linear regression model was constructed to examine predictors of healthcare professionals' readiness for AI applications, incorporating knowledge, attitudes, and sociodemographic variables (Table 6). The overall model was not statistically significant (F-test $p = 0.140$), and explained only 2.6% of the variance in readiness (Adjusted $R^2 = 0.026$), suggesting that the predictors collectively contributed minimally to explaining readiness scores. However, within the model, the variable professional role emerged as a statistically significant predictor ($\beta = 0.121$, $p = 0.011$). This indicates that readiness levels varied meaningfully across healthcare professions, even though the explanatory power of the model as a whole was weak. In other words, while the combination of predictors did not strongly predict readiness, professional role alone had a unique contribution in differentiating readiness levels. Other factors, including knowledge, attitudes, age, marital status, education, years of experience, and gender, were not significant predictors ($p > 0.05$).

Table 6: Adjusted Regression Model of Readiness by Knowledge, Attitude, and Sociodemographic Characteristics

Predictor	B	SE	β	t	p
Knowledge	0.000	0.002	0.009	0.191	.849
Attitude	0.089	0.080	0.051	1.111	.267
Age	0.050	0.103	0.025	0.491	.624
Gender	-0.116	0.277	-0.020	-0.419	.675
Marital Status	0.091	0.113	0.038	0.809	.419
Educational Level	-0.122	0.117	-0.054	-1.043	.297
Years of Experience	-0.020	0.052	-0.018	-0.374	.709

HCP's Role	0.183	0.071	0.121	2.564	.011*

Model summary: $R^2 = .026$, Adjusted $R^2 = .010$, $F(8, 461) = 1.58$, $p = .140$
Note. B = unstandardized coefficient; SE = standard error; β = standardized coefficient. *$p < .05$.

4. Discussion

This study aimed to assess the knowledge, attitudes, and readiness of HCPs regarding the application of AI in healthcare institutions in the NBG, Oman. A robust response rate was achieved, with 470 participants exceeding the estimated sample size of 335. The majority of respondents were female (96%), and 63% held a bachelor's degree. Participants represented a relatively balanced distribution in terms of years of professional experience.

The findings revealed moderate familiarity with AI applications, generally positive attitudes, and a moderate level of readiness to integrate AI into practice. Specifically, the mean knowledge score was 56%, the mean attitude score was 3.3 (±0.7), and the mean readiness score was 3.0 (±1.2). These results suggest that while foundational knowledge and attitudes toward AI are encouraging, there remains scope to strengthen HCPs' readiness for AI implementation.

4.1 Knowledge and Attitudes Toward AI

Participants demonstrated moderate knowledge of AI in healthcare, consistent with prior research (Nazaretsky et al., 2022; Al Darayseh, 2023; Lin & Chen, 2024; Serbaya et al., 2024). Most participants were familiar with basic AI-related terms, such as artificial intelligence, machine learning, and deep learning. However, familiarity declined for more advanced concepts such as neural networks, highlighting the need for targeted educational interventions. These results contrast with those of Al-Zaabi et al. (2023), who reported low AI familiarity, particularly among senior HCPs. The discrepancy may reflect increased exposure to AI among younger or more digitally literate professionals (Al Hadithy et al., 2023; Serbaya et al., 2024). Overall, the findings underscore the need for structured AI education, particularly focused on advanced concepts and practical applications. Training should be tailored to address varying baseline knowledge levels across different professional groups.

The generally positive attitudes toward AI, as reflected in the mean score of 3.3, are consistent with findings from previous studies (Al Omari et al., 2024; Lin & Chen, 2024; Al-Zaabi et al., 2023; Taherdoost, 2021). Similarly, Swan (2021) and Booth et al. (2021) reported strong enthusiasm among nurses for AI integration into clinical workflows, with more than 70% agreeing that AI would enhance nursing practice. Importantly, concerns about AI displacing healthcare roles were minimal in this study, echoing results from other contexts (Oh et al., 2019; Davenport & Kalakota, 2019). However, this contrasts with findings from Saudi Arabia, where Abdullah and Fakieh (2020) noted heightened concerns about job security. The results suggest that Omani HCPs are more likely to perceive AI as a supportive tool rather than a threat to professional roles.

4.2 Readiness for AI Application

Readiness to implement AI was moderate (mean = 3.0 ±1.2), in line with findings from Al-Zaabi et al. (2023), though contrasting with studies reporting low readiness due to limited knowledge, discomfort with AI tools, or fear of job displacement (Ahmed et al., 2022; Al Saad et al., 2022; Tespal et al., 2024). This study revealed significant variations in readiness by age, marital status, and professional role. Older HCPs (≥36 years) demonstrated higher readiness levels compared to younger participants ($p = 0.009$). This contrasts with prior research suggesting that older professionals are less receptive to AI (Booth et al., 2021; Tespal et al., 2024). The finding may reflect greater professional experience, accumulated exposure to training, or proactive learning behaviors among older HCPs in Oman. These results highlight the value of mentorship programs in which experienced professionals support younger colleagues in adopting AI technologies.

Marital status was also significantly associated with readiness, with married or previously married participants scoring higher (3.1 ±1.2) than single participants (2.7 ±1.3). Although rarely reported in prior literature, this finding may suggest that emotional and social support systems linked to marital status enhance resilience and adaptability when encountering new technologies.

Professional role emerged as another significant predictor, with midwives reporting the highest readiness (3.3 ±1.1), followed by physicians (3.1 ±1.1), and nurses (2.8 ±1.2). While few comparative studies have examined these specific professions, this novel result suggests role-based differences in exposure, responsibility, and engagement with digital health tools. These findings underscore the importance of designing profession-specific readiness programs and call for further investigation in Oman and similar healthcare contexts.

Although the multivariate regression model explained only 2.6% of the variance in readiness and was not statistically significant overall ($p = 0.140$), professional role remained a statistically significant individual predictor ($p = 0.011$). This highlights an important statistical nuance: a model may lack strong overall explanatory power, yet individual variables within it can still meaningfully predict differences in outcomes (Hair et al., 2020). The low R^2 suggests that additional factors not captured in the model, such as organizational culture, institutional support, or prior exposure to AI training, may play a more decisive role in shaping readiness. Future studies should therefore examine broader structural and contextual influences that could strengthen model fit and improve our understanding of readiness for AI adoption.

4.3 Limitation

This study is not without limitations. First, the regression model demonstrated a low explanatory power ($R^2 = 0.026$), indicating that only a small proportion of the variance in readiness was explained by the included predictors. While professional role emerged as a significant factor, the overall non-significant model suggests that important systemic and organizational variables, such as institutional readiness, access to AI-related training, and technological infrastructure, were not captured in the current analysis. Future studies should therefore adopt a more comprehensive approach, incorporating multilevel predictors that span individual, organizational, and policy domains. Second, cross-sectional design limits the ability to infer causality between knowledge, attitudes, and readiness. Longitudinal studies are needed to assess changes in readiness over time and in response to targeted interventions. Finally, the study was conducted in a single governorate, which may limit the generalizability of the findings to other regions of Oman or comparable healthcare systems. Nonetheless, the large sample size and inclusion of diverse healthcare professions strengthen the relevance of the results.

4.4 Implications for Practice

The findings of this study have several implications for healthcare practice, policy, and research. First, while HCPs in Oman demonstrated moderate knowledge, positive attitudes, and moderate readiness toward AI applications, the limited explanatory power of the regression model ($R^2 = 0.026$) indicates that readiness cannot be predicted solely by individual characteristics such as knowledge, age, or marital status. Instead, systemic and organizational factors, including institutional support, access to training, leadership engagement, and the availability of AI-enabled infrastructure, are likely to play a more decisive role in shaping readiness. The fact that the professional role emerged as a significant predictor despite the overall non-significant model highlights that certain occupational groups, such as midwives and physicians, may be more exposed to or engaged with AI-related practices. This suggests that profession-specific training and tailored implementation strategies could accelerate adoption. However, improving readiness across the healthcare system will require broader, organization-wide approaches that move beyond individual-level attributes. For policy and practice, these results underscore the need to develop national frameworks and structured capacity-building programs aligned with Oman Vision 2040, ensuring equitable readiness across all healthcare professions. For research, future studies should integrate additional predictors, such as institutional culture, perceived organizational readiness, and access to digital infrastructure, to better capture the complex, multilevel factors influencing readiness for AI adoption.

5. Conclusion

In conclusion, this study demonstrated that HCPs in Oman possess moderate knowledge and readiness, alongside positive attitudes toward AI in healthcare. While professional role independently predicted readiness, the overall regression model had low explanatory power, suggesting that individual characteristics alone are insufficient to explain preparedness. These findings emphasize the importance of system-level interventions, including national strategies, institutional readiness programs, and tailored professional development, to enhance preparedness for AI integration. Ultimately, strengthening both individual competencies and organizational capacities will be critical to ensuring the responsible and effective adoption of AI technologies in Omani healthcare.

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