

ATTITUDES AND FAMILIARITY OF HOSPITAL ADMINISTRATIVE AND MEDICAL STAFF TOWARDS ARTIFICIAL INTELLIGENCE: A CROSS-SECTIONAL STUDY IN TURKEY

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ABSTRACT

Artificial intelligence in healthcare holds great promise and continues to advance. Despite the clear potential of its integration into healthcare delivery and management, little has been investigated about the attitudes and familiarity of hospital administrative and medical staff towards artificial intelligence.

In this study, we cross-sectionally surveyed 152 administrative and medical staff who were employed in two private hospitals in the northern region of Türkiye with a structured questionnaire on their attitudes and familiarity regarding artificial intelligence in healthcare delivery and management.

Our results showed that only 8.6% of the 152 participants used AI in their work, and 13.8% followed ongoing AI developments in healthcare. Despite this limited engagement, the majority recognized AI's potential benefits. For instance, 74.4% (with 23.0% partially agreeing) acknowledged its value in education and research, and similar high percentages supported its potential for workload reduction, learning enhancement, data processing, healthcare delivery, and innovation. In contrast, attitudes were divided regarding AI's ability to reduce healthcare costs, minimize errors, offer a competitive advantage, assist in decision-making, and optimize healthcare resources. Concerns about job displacement were also prominent, with 45.4% agreeing and 35.5% partially agreeing that AI could lead to unemployment in healthcare. Statistical tests showed significant differences across occupations. Administrative staff demonstrated higher knowledge and optimism about AI applications in competitive positioning (94.2%) and customer relationship management (95.5%) compared to physicians (57.1% and 68.9%) and nurses (77.5% and 74.4%).

Despite general optimism about AI's potential, both Turkish medical professionals and healthcare managers face notable gaps in familiarity and engagement, as well as concerns about decision-making, healthcare costs, and job displacement. To enhance staff readiness for AI adoption, Turkish hospitals must urgently address these challenges through structured AI training programs.

KEYWORDS

artificial intelligence, healthcare delivery, healthcare management, Turkish, Türkiye

INTRODUCTION

Artificial intelligence (AI) can be described as the ability of machines to perform tasks usually associated with human cognitive functions such as learning and problem solving [1]. AI in healthcare holds great promise and continues to advance. It has been shown that AI algorithms can assist healthcare professionals by providing decision support systems in various clinical practices including radiology [2,3], dermatology [4,5], and ophthalmology [6]. AI also has the potential to be integrated into hospital management. AI-based automation tools have a great potential for enabling automation of redundant healthcare tasks and prescription writing and thus increasing operational efficiency of hospital service production [7,8]. AI-based chatbot services and virtual health assistants are evolving with the potential of increasing patient satisfaction as well as reducing healthcare costs and improving accessibility to medical knowledge [9-11]. While the potential role of AI in neutralizing human biases in the recruitment and selection processes has already been highlighted in several articles [12,13], it is foreseen that it can also be integrated into the in-service training and personal development processes as the training instructors [14].

A technology can only yield the expected results if it is adopted by its users. Accordingly, the successful integration of AI into hospital settings depends on the active involvement of hospital staff. However, research on the attitudes and familiarity of hospital staff towards AI remains limited, particularly among hospital administrative staff. Previous research, which primarily focuses on medical staff, has highlighted limited knowledge and familiarity with AI [15-17], as well as concerns about AI replacing human jobs [1,15,18] and doubts about the accuracy of AI algorithms [1]. Similarly, studies conducted among Turkish medical professionals [19,20] have reported minimal use of AI tools and insufficient AI training. While these studies provide valuable insights into the challenges faced by medical staff, they have largely overlooked hospital administrative staff and management, leaving a gap in research on AI adoption across hospital roles.

This study, conducted in two private Turkish hospitals, aimed to examine the attitudes and familiarity of both administrative and medical staff towards AI in healthcare, with a specific focus on healthcare and hospital management. Here, "attitudes" refer to hospital staff's perceptions and beliefs about AI in healthcare, including its acceptance, potential benefits, and broader implications such as concerns about job displacement and skepticism regarding the accuracy and reliability of AI-based algorithms in hospital settings. "Familiarity" refers to both direct experience with AI and general knowledge of its applications in various hospital departments, such as healthcare service delivery, human resources, and customer relationship management.

METHODS

STUDY DESIGN AND DATA COLLECTION

This study employed a cross-sectional design and was conducted in two private hospitals in the northern region of Türkiye. There were a total of 65 medical, 120 nursing, and 23 administrative staff members across both hospitals (N=208). The study sample consisted of 152 participants, representing a participation rate of 73.0%. Data were collected through a convenience sampling method on a voluntary basis from 14-31 March 2023, using a survey developed by the authors based on a literature review.

INSTRUMENT

The survey included 29 questions: 6 demographic questions and 23 assessing attitudes and familiarity towards AI in healthcare delivery and management. To ensure content validity and relevance, the 23 questions were reviewed by two academic experts with experience in healthcare management. Their feedback was incorporated to refine the clarity and appropriateness of the survey items. Each survey question was designed as a subjective item, with expressions such as "do you think AI can..." or "do you have any knowledge about AI applications in...". Of the 23 items, 5 focused on familiarity with AI in hospital administrative departments: 2 on healthcare service production, 2 on human resources, and 1 on customer relationship management. The remaining 18 items assessed general attitudes and beliefs around and familiarity with AI in healthcare. Each item had three response options: (1) "Yes", (2) "No", and (3) "Partially". While Likert scales (e.g., 5-point scales) are commonly used to capture more nuanced responses, a limited set of response options

was chosen to minimize confusion and streamline participant responses. This approach was particularly suitable given that the goal was to assess general attitudes and familiarity with AI, rather than measuring the intensity of these attitudes.

STATISTICAL ANALYSIS

Statistical analysis was performed using IBM SPSS Statistics 22. Descriptive statistics and frequencies were calculated for survey responses. Normality tests (Kolmogorov-Smirnov and skewness/kurtosis tests) were conducted to determine the appropriate statistical tests. As the data did not follow a normal distribution, non-parametric tests (Mann-Whitney and Kruskal-Wallis H) were used. The Chi-squared test was applied to compare categorical variables. A significant level of $p < 0.05$ was adopted.

ETHICAL CONSIDERATIONS

The study protocol was approved by the Sakarya University Ethics Committee (Code E-61923333-050.99-229068). The consent from the two hospitals where the data were collected was also obtained.

RESULTS

SOCIODEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

The sociodemographic characteristics of the entire sample ($n=152$) was given in Table 1. The majority of the participants were female ($n=106$, 69.7%), were aged between 19 and 28 years ($n=77$, 50.7%), and were nurses ($n=103$, 67.8%).

TABLE 1. SOCIODEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

Gender	n	%
Male	46	30.3
Female	106	69.7
Age	n	%
19-28	77	50.7
29-38	39	25.7
39-48	25	16.4
≥49	11	7.2
Education	n	%
High school	48	31.6
Associate	49	32.2
Undergraduate	27	17.8
Postgraduate	28	18.4
Occupation	n	%
Administrative staff	23	15.1
Physician	26	17.1
Nurse	103	67.8

SURVEY OVERVIEW

The survey results were given in Table 2. In the first section of the survey, Q11 (*Do you think AI can be a valuable asset in education and research in healthcare?*) was the question with the highest rate of "yes" responses (74.4%), whereas only 8.6% of the participants answered "yes" to Q17 (*Are you currently using AI in your area of work?*). Another item questioning participants' familiarity with AI (Q15: *Do you follow current developments regarding AI in healthcare?*) also had a quite low rate of "yes" responses (13.8%). Yet very few participants (15.8%) answered "yes" to Q18, questioning participants about their anticipated challenges in using AI in their area of work (*Do you think you would have difficulty when using AI in your area of work in the future?*). We provided a detailed interpretation of the results, highlighting potential factors influencing participants' varying responses, such as optimism, skepticism, and familiarity with AI.

TABLE 2. THE SURVEY RESULTS

Section 1: Attitudes and beliefs around and familiarity with AI in healthcare in general	Yes		No		Partially	
	n	%	n	%	n	%
Q1: Do you think AI is needed in healthcare?	84	55.2	10	6.6	58	38.2
Q2: Do you think AI can be helpful in your area of work?	102	67.1	10	6.6	40	26.3
Q3: Do you think AI can offer important advantages in healthcare delivery?	91	59.8	15	9.9	46	30.3
Q4: Do you think AI can help to reduce costs for healthcare?	58	38.2	41	27.0	53	34.8
Q5: Do you think AI can support the efficient use of limited resources in healthcare?	77	50.7	19	12.5	56	36.8
Q6: Do you think AI can offer a competitive advantage in healthcare delivery?	77	50.7	30	19.7	45	29.6
Q7: Do you think AI can reduce the workload of healthcare professionals?	100	65.8	14	9.2	38	25.0
Q8: Do you think AI can reduce the risk of making mistakes in delivering healthcare?	62	40.7	35	21.1	58	38.2
Q9: Do you think AI can make easier the learning processes in healthcare?	98	64.5	14	9.2	40	26.3
Q10: Do you think AI can drive innovation in healthcare delivery?	84	55.2	13	8.6	55	36.2
Q11: Do you think AI can be a valuable asset in education and research in healthcare?	113	74.4	4	2.6	35	23.0
Q12: Do you think AI can process data, interpret meaning, and offer appropriate suggestions in healthcare domain?	95	62.5	14	9.2	43	28.3
Q13: Do you think AI would become an indispensable part of the healthcare systems in the future?	76	50.0	26	17.1	50	32.9
Q14: Do you think AI-based decision support can assist healthcare professionals in their healthcare practices?	67	44.0	20	13.2	65	42.8
Q15: Do you follow current developments regarding AI in healthcare?	21	13.8	50	32.9	81	53.3
Q16: Do you think AI would cause high level of unemployment in the healthcare sector in the future?	69	45.4	29	19.1	54	35.5
Q17: Are you currently using AI in your area of work?	13	8.6	139	91.4	0	0.0
Q18: Do you think you would have difficulty when using AI in your area of work in the future?	24	15.8	64	42.1	64	42.1
Section 2: Familiarity with AI in the administrative departments of hospitals	Yes		No		Partially	
	n	%	n	%	n	%
Q19: Do you have any knowledge about AI applications in healthcare delivery?	44	28.9	49	32.2	59	38.8
Q20: Do you have any knowledge about AI-based prescribing support systems, pharmacy support systems, and diagnostic clinical decision support systems?	54	35.5	47	30.9	51	33.6
Q21: Do you have any knowledge about AI applications in recruitment and selection processes?	27	17.8	67	44.0	58	38.2
Q22: Do you have any knowledge about AI applications in in-service training and professional development activities?	43	28.3	67	44.1	42	27.6
Q23: Do you have any knowledge about AI applications in customer relationship management?	20	13.2	94	61.8	38	25.0

AI'S ACCEPTANCE

Most participants believed or partially believed that AI was necessary in healthcare (55.2% and 38.2%, respectively) and their respective fields (67.1% and 26.3%, respectively), while a small percentage (6.6%) remained skeptical about AI's necessity in both healthcare and their area of work. This suggested a general optimism about AI, though some participants might still have reservations regarding its full implementation, effectiveness, or ethical implications.

Further supporting this optimism, 50.0% of participants believed AI would become an indispensable part of healthcare systems in the future, with an additional 32.9% partially agreeing, reflecting strong expectations for AI's role moving forward. Additionally, a majority of participants felt either confident (42.1%) or uncertain (42.1%) about their ability to use AI effectively, suggesting that while some might fear challenges, many were open to learning and adapting to AI technologies in the future.

AI'S BENEFITS

Most participants recognized or partially recognized AI's potential benefits in education and research (74.4% and 23.0%, respectively), workload reduction (65.8% and 25.0%, respectively), learning processes (64.5% and 26.3%, respectively), data processing (62.5% and 28.3%, respectively), healthcare delivery (59.8% and 30.3%, respectively) and innovation (55.2% and 36.2%, respectively), while a small but consistent percentage (around 6-10%) remained skeptical. This suggested that while many participants acknowledged AI's potential, some might need more evidence, training, or firsthand experience before fully embracing its use.

CONCERNS AND SKEPTICISM TOWARDS AI

When asked about AI's ability to reduce healthcare costs (27.0% disagreed; 34.8% partially agreed), minimize errors (21.1% disagreed; 38.2% partially agreed), offer a competitive advantage (19.7% disagreed; 29.6% partially agreed), assist in decision-making (13.2% disagreed; 42.8% partially agreed), and optimize the use of limited healthcare resources (12.5% disagreed; 36.8% partially agreed), responses were more divided. This indicated that while many participants acknowledged AI's potential in these areas, a significant level of uncertainty and skepticism remained.

Additionally, nearly half (45.4%) of participants believed that AI would lead to high unemployment in healthcare in the future, with an additional 35.5% partially agreeing. This highlighted that a significant portion of participants were concerned about AI's potential negative impact on employment in the healthcare sector.

FAMILIARITY WITH AI

A small percentage (8.6%) of participants reported using AI in their area of work, while the majority (91.4%) were not yet utilizing AI technologies. This suggested a low level of AI integration in daily workflows, highlighting potential challenges in its widespread adoption within healthcare and hospital settings. Consistently, only 13.8% of participants actively followed AI developments in healthcare. Additionally, participants' responses regarding familiarity with AI in hospital administrative departments were generally negative, with "yes" responses to each of the five items being below 35.5%.

STATISTICAL TEST RESULTS

We tested all possible interactions between the sociodemographic variables and each of the survey items, presenting the significant ones in Table 3.

TABLE 3. THE SIGNIFICANT STATISTICAL TEST RESULTS

Q2: Do you think AI can be helpful in your area of work?					
Age	n	%	H test	p	Post-hoc test
1) 19-28	77	75.1	11.992	0.007	1-3; p=0.006 2-3; p=0.002 3-4; p=0.009
2) 29-38	39	68.9			
3) 39-48	25	98.1			
4) ≥49	11	64.0			
Q5: Do you think AI can support the efficient use of limited resources in healthcare?					
Age	n	%	H test	p	Post-hoc test
1) 19-28	77	77.0	1.429	0.010	1-3; p=0.006 2-3; p=0.001 3-4; p=0.002
2) 29-38	39	64.6			
3) 39-48	25	98.0			
4) ≥49	11	66.7			
Q5: Do you think AI can support the efficient use of limited resources in healthcare?					
Education	n	%	H test	p	Post-hoc test

1) High school	48	92.1			
2) Associate	49	69.3	11.382	0.010	1-2; p=0.005
3) Undergraduate	27	73.6			1-4; p=0.004
4) Postgraduate	28	65.1			

Q6: Do you think AI can offer a competitive advantage in healthcare delivery?

Education	n	%	H test	p	Post-hoc test
1) High school	48	84.6			
2) Associate	49	80.4	9.791	0.020	1-4; p=0.003
3) Undergraduate	27	76.5			2-4; p=0.010
4) Postgraduate	28	55.8			

Q6: Do you think AI can offer a competitive advantage in healthcare delivery?

Occupation	n	%	H test	p	Post-hoc test
1) Administrative staff	23	94.2			
2) Physician	26	57.1	10.506	0.005	1-2; p=0.001
3) Nurse	103	77.5			2-3; p=0.021

Q20: Do you have any knowledge about AI applications in recruitment and selection?

Occupation	n	%	H test	p	Post-hoc test
1) Administrative staff	23	68.4			
2) Physician	26	61.0	6.729	0.035	2-3; p=0.017
3) Nurse	103	82.2			

Q23: Do you have any knowledge about AI applications in customer relationship?

Occupation	n	%	H test	p	Post-hoc test
1) Administrative staff	23	95.5			
2) Physician	26	68.9	6.514	0.039	1-2; p=0.019
3) Nurse	103	74.4			1-3; p=0.022

STATISTICAL TEST RESULTS ACROSS DIFFERENT AGE GROUPS

Participants aged 39-48 reported the highest percentages for Q2 (*Do you think AI can be helpful in your area of work?*, 98.1%) and Q5 (*Do you think AI can support the efficient use of limited resources in healthcare?*, 98.0%), significantly higher ($p < 0.05$) than participants aged 19-28 (Q2: 75.1%, Q5: 77.0%), 29-38 (Q2: 68.9%, Q5: 64.6%), and ≥ 49 (Q2: 64.0%, Q5: 66.7%). This indicated that middle-aged staff were more likely to recognize AI's potential to enhance their work and improve resource efficiency in healthcare. This might be due to career experience or adaptability to new technologies, whereas younger and older participants might be forming a view of AI or more cautious about adoption.

STATISTICAL TEST RESULTS ACROSS DIFFERENT EDUCATION LEVELS

Participants with a high school education reported the highest percentages for Q5 (*Do you think AI can support the efficient use of limited resources in healthcare?*, 92.1%) and Q6 (*Do you think AI can offer a competitive advantage in healthcare delivery?*, 84.6%), significantly higher ($p < 0.05$) than those with a postgraduate degree (Q5: 65.1%, Q6: 55.8%). This indicated that those with lower education levels were more optimistic about AI's ability to improve resource efficiency and offer a competitive advantage. This might be because they focused on AI's immediate benefits such as reducing repetitive tasks and improving resource management. Alternatively, they might simply perceive AI technologies as inherently beneficial, without fully considering the underlying challenges and constraints, while those with higher education levels might be more critical due to a deeper understanding of healthcare systems and technology limitations.

STATISTICAL TEST RESULTS ACROSS DIFFERENT OCCUPATIONS

Administrative staff had the highest percentages for Q6 (*Do you think AI can offer a competitive advantage in healthcare delivery?*, 94.2%) and Q23 (*Do you have any knowledge about AI applications in customer relationship management?*, 95.5%), significantly higher ($p < 0.05$) than physicians (Q6: 57.1%, Q23: 68.9%) and nurses (Q6: 74.4%). Additionally, nurses had the highest percentage for Q20 (*Do you have any knowledge about AI applications in recruitment and selection processes?* 82.2%), significantly higher ($p < 0.05$) than physicians (Q20: 61.0%). These findings suggested that administrative

staff were more optimistic about AI's potential to offer a competitive advantage and more knowledgeable about its applications in customer relationship management, likely due to their focus on the operational aspects of healthcare delivery. On the other hand, nurses appeared more familiar with AI applications in recruitment and selection, possibly because these processes were more directly relevant to their day-to-day responsibilities. Physicians, meanwhile, had lower scores in all these areas, likely because their primary focus on patient care left them less engaged with or aware of AI applications in administrative functions. Medical staff's cautious approach might also be influenced by concerns about AI's limitations in clinical practice and its potential impact on patient outcomes.

DISCUSSION

The aim of this study was to examine the attitudes and familiarity of both administrative and medical staff towards AI in healthcare delivery and management. The present findings provided valuable insights into how different hospital staff groups perceive AI. Administrative staff demonstrated greater optimism and familiarity with AI's managerial applications, such as competitive positioning and customer relationship management, likely due to their direct involvement in these areas. In contrast to the administrative staff, medical staff, especially physicians, approached these applications of AI with greater caution. While this might partly stem from their primary focus on patient care, leaving them less engaged with or aware of AI applications in administrative functions, their cautious stance might also be driven by concerns about AI's limitations in clinical practice and its potential impact on patient outcomes. Indeed, a qualitative study analyzing text-based comments from healthcare professionals, 65.3% of whom were physicians, revealed concerns about the accuracy of AI-powered applications [1]. Similarly, a cross-sectional study on Turkish physicians identified trust as the strongest predictor of physicians' willingness to integrate AI into their practices [21]. Therefore, unless concerns about AI's reliability in clinical practice are fully addressed, physicians are likely to resist its widespread adoption in healthcare, thereby limiting its potential to drive competitive advantage.

Age and education level were found to influence hospital staff's perceptions and understanding of AI, suggesting nuanced differences in attitudes across these groups. Hospital staff aged 39-48 were more likely than those in the 19-28, 29-38, and ≥ 49 age groups to recognize AI's potential to enhance their work and improve resource efficiency in healthcare. Additionally, hospital staff with higher education levels, particularly those with postgraduate degrees, were less optimistic about AI's benefits. However, we could not fully account for occupation due to insufficient sample size within certain groups (e.g., physicians), which might affect the interpretation of these findings. Future research should better address this limitation by ensuring a more balanced sample across age, education, and occupational groups, which would allow for a more comprehensive understanding of how these factors influence attitudes towards AI in healthcare and hospital settings.

The majority of hospital staff demonstrated general optimism about AI's potential in healthcare and hospital settings, with greater interest in its ability to enhance work efficiency, support resource management, and contribute to education and research. However, this optimism was accompanied by concerns and skepticism, particularly regarding decision-making, healthcare costs, and the potential for job displacement, issues similarly noted in previous studies [1, 15, 18]. On the other hand, despite their general positive outlook, we observed a notable gap in staff familiarity with AI technologies. Low usage rates in their current roles, coupled with limited engagement in ongoing AI developments, revealed substantial barriers to widespread adoption and integration. The lack of familiarity is consistent with previous research documenting limited AI knowledge among healthcare professionals [15-17, 19, 20]. These findings underscore the need for targeted educational initiatives and training programs that both enhance familiarity with AI technologies and address concerns regarding its impact on decision-making and job roles. Hospital-driven initiatives that provide hands-on experience and real-time applications of AI tools could increase AI literacy and foster broader adoption, ultimately maximizing its benefits in healthcare delivery and management.

LIMITATIONS

The present study had several limitations. First, our findings might not be generalizable beyond the surveyed participants, as the sample was limited to specific hospital settings. However, they were consistent with the results of similar studies conducted both in Türkiye and globally. Second, as with any survey-based research, self-report bias may have influenced the responses. Participants may have responded in a socially desirable manner rather than reflecting their true attitudes. Third, although our study was conducted across two different hospitals with the aim of reaching the entire sample, our participants were limited to those who were readily available and willing to participate, resulting in a convenience sample. This limitation further constrains the generalizability of our findings. Fourth, although we kept the survey concise and straightforward to encourage participation, the participation rate among physicians was notably low (40.0%). Extending the survey period and employing additional recruitment strategies (e.g., incentives) might have increased physician participation. However, due to time constraints, we were unable to achieve a more representative response from this group. Fifth, the use of a structured questionnaire limited our ability to comprehensively capture our participants' in-depth opinions regarding AI in healthcare. Future research could incorporate qualitative methods to gain a more comprehensive understanding of hospital staff's perspectives. Sixth and last, while our questionnaire was based on a well-established framework and reviewed by two academic experts to ensure its relevance, we did not conduct pilot testing or formal reliability analysis (e.g., Cronbach's alpha). Our primary focus was on gathering broad data rather than validating the instrument in-depth. Future studies could enhance the validity and reliability of the instrument by conducting pilot testing and formal reliability analysis.

CONCLUSION

In conclusion, this study highlights the diverse attitudes and familiarity of hospital staff toward AI in healthcare delivery and management. While administrative staff demonstrated greater optimism and familiarity with AI's managerial applications, medical staff, particularly physicians, exhibited more caution. Additionally, age and education level played significant roles in shaping certain attitudes towards AI, with middle-aged staff recognizing AI's benefits more than younger or older colleagues, and highly educated individuals displaying more skepticism. However, limitations in sample representation suggest that future research should ensure a more balanced distribution to provide a more comprehensive understanding of AI perceptions in healthcare and hospital settings.

Despite general optimism regarding AI's potential, significant gaps in familiarity and engagement with AI technologies persist among hospital staff, hindering its widespread adoption. Concerns and skepticism, particularly regarding decision-making, healthcare costs, and the potential for job displacement, further highlight the need for targeted educational initiatives and training programs. To address these challenges, Turkish hospitals should implement structured AI training that enhances AI literacy, mitigates skepticism, and builds staff confidence in integrating AI into their daily practices. Additionally, by promoting the practical application of AI technologies and providing hands-on opportunities for staff to engage with these tools, hospitals can bridge familiarity gaps and maximize AI's benefits in healthcare delivery and management.

AUTHOR CONTRIBUTIONS:

The authors confirm contribution to the paper as follows: the study concept and design: BB and SA; data collection and analysis: BB and SA; interpretation of results: BB, SA, and GÜ; draft manuscript preparation: BB, SA, and GÜ. All authors reviewed the results and approved the final version of the manuscript.

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The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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