



Determining the Relationship Between Nurses' Evaluation of Health Technologies and Their Attitudes Towards Artificial Intelligence

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Keywords

Nurse,
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ABSTRACT

Objective: This research was conducted to determine the relationship between nurses' evaluation of health technologies and their attitudes towards artificial intelligence. **Method:** The data of the study was collected between December 15, 2023 and February 15, 2024. The population of this research consisted of 404 nurses working in a public hospital. Introductory information form, healthcare personnel health technologies evaluation attitude scale, general attitude scale towards artificial intelligence, academic literacy scale were used to collect data. **Results:** 66.6% of the nurses participating in the study were between the ages of 18-30, 60.9% were women, 58.9% were single, 70.3% had a bachelor's degree, 53.2% were in the 4-6 years of their working years. It was found that 57.7% worked in shifts and 40.6% worked in other services. The mean score of the Health Technologies Evaluation Attitude Scale of the nurses included in the research was found to be $4.10 \pm .552$, and the mean score of the General Attitude Scale Towards Artificial Intelligence was $3.30 \pm .539$. A positive, moderately significant relationship was found between the Nurses' Health Technologies Evaluation Attitude Scale Scores and the General Attitude Scale Towards Artificial Intelligence score averages ($p < 0.001$). **Conclusion:** It was determined that there was a significant relationship between nurses' attitudes towards evaluating health technologies and their attitudes towards artificial intelligence.



1. INTRODUCTION

The phrase "artificial intelligence" was initially coined in 1956 during a conference convened at Dartmouth College in the United States. Over the years, both the concept and its applications have evolved significantly, witnessing numerous transformations [1]. In its early stages, artificial intelligence was primarily linked with the realm of computer science [2]. However, it progressively shifted towards the domain of health sciences, playing a pivotal role in leveraging artificial intelligence for diagnosing, caring, and treating various diseases [3]. This shift occurred due to the imperative of enhancing the quality of healthcare services and systems for individuals [4].

Artificial intelligence's integration also impacts nurses' workloads, with its utilization in predicting and alerting about life-threatening conditions in high-risk patients already underway [5]. Additionally, it affords nurses extra time to comprehend the needs and desires of patients [6]. The potential for employing artificial intelligence

in healthcare is optimistic and holds promise. Its implementation can notably decrease the occurrence of errors and oversights among healthcare professionals while facilitating cost savings [7]. Nevertheless, apprehensions exist regarding the potential of artificial intelligence in direct patient care to diminish nurse-patient communication [8,9]. Yet, there is the possibility of artificial intelligence introducing technical errors and challenges in diagnostic models [10,11].

The acceptance and integration of medical AI technologies by nurses may hinge on factors like their expertise, receptiveness, and outlook. Hence, it is imperative for healthcare systems and AI developers to meticulously assess and gauge these aspects. [12]. Additionally, it's vital to consider the present status of artificial intelligence and its adoption rate among nurses [13].

With the development and rapid distribution of technology, the need for equipped individuals has increased even more. Because today, it is considered important to provide adequate employment in terms of knowledge and technology

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in line with the requirements of the age, both in public institutions and payments for private processes [14,15]. The performances of these technologically equipped personnel are presented, features such as the ability to perform the services offered more effectively and efficiently, the establishment of a healthy communication with the target audience, the emergence of the culture of cooperation and organization within the shining structure, and the growth of the pressure at the highest temperature are of great importance [16].

This research aims to examine how nurses' perceptions of health technologies relate to their attitudes toward artificial intelligence. During the literature review, only a small number of studies were uncovered that specifically address this association. Therefore, it is thought that this research will make a significant contribution to the literature. For this purpose, the research questions of this study are as follows:

1. What is the level of nurses' evaluation of health technologies?
2. What are the attitude levels of nurses towards artificial intelligence?
3. Is there a relationship between nurses' level of evaluation of health technologies and their level of attitude towards artificial intelligence?

2. METHODOLOGY

2.1. Purpose of the Research

In the study, a relational screening model, one of the quantitative research methods, was used to determine the relationship between nurses' level of evaluation of health technologies and their attitude level towards artificial intelligence. Place and Time the Research Was Conducted The research was conducted in a public hospital between December 15, 2023 and February 15, 2024.

2.1.1. Participant

Population and Sample of the Research: The population of the research consisted of all nurses working in a public hospital between the dates the research was conducted. The sample consisted of those who agreed to participate in the study between 15 December 2023 and 15 February 2024.

2.2. Data Collection Tools

2.2.1. Personal Information Form

The form consists of a total of seven questions to determine descriptive characteristics such as age, gender, marital status, educational status, working years, working style, and the clinic where he/she works.

2.2.2. Health Personnel Health Technologies Evaluation Attitude Scale (SPSTDTÖ)

Developed by Kuşcu, Yılmaz and Kuşcu Karatepe (2022), SPSTDTÖ consists of 23 questions and 3 dimensions; 1-4. The questions determine the scope of the scale, levels 5-11. The questions examine the awareness dimension, 12th-23rd. The questions constitute the benefit dimension. There is no reverse coding in the scale. The scale prepared in 5-point Likert type is rated as "1-I strongly disagree, 2-I disagree, 3-I am undecided, 4-I agree, 5-I strongly agree." It can be inferred that as it gets closer to 1, the Health Technology Assessment has a lower score, and as it gets closer to 5, it has a higher score. Kuşcu et al. (2022) stated that the Cronbach Alpha value of the scale was 0.959. In this study, the Cronbach Alpha value was found to be 0.948. This value shows that SPSTDTÖ is highly reliable (Kalaycı, 2017; Uzunsakal and Yıldız, 2018).

2.2.3. General Attitudes Towards Artificial Intelligence Scale (GAAIS)

This scale was developed by Schepman and Rodway (2020). In order to measure individuals' general attitudes towards artificial intelligence, the scale contains a total of 20 items, 12 of which are positive and 8 items are negative. Items were scored as a five-point Likert type (1 = Strongly disagree, 5 = Strongly disagree). In the validation study, Cronbach's alpha values of the two factors were calculated as 0.88 for positive general attitudes and 0.82 for negative general attitudes, while 0.84 for positive subscales and 0.80 for negative subscales, both of which represent good internal consistency. It does. Kaya et al. (2022) Factor structure in Turkish validity and reliability research also revealed similar results in the validation study by Schepman and Rodway; because KMO was 0.90 and Bartlett's test was significant.

2.3. Data collection

Before data collection, after the purpose of the research was stated, written consent was obtained from the nurses who agreed to participate in the research and the questionnaires were administered by the researcher. The data

collection process took approximately 15-20 minutes. Data was collected via Google Forms.

2.4. Data Analysis

SPSS (Statistical Package For Social Sciences) 22.0 package program was used to analyze the data. Number, mean, percentage distributions and standard deviation were used in the analysis of descriptive data. Cronbach's alpha coefficient was used to calculate the reliability coefficients of the scales and Pearson Correlation analysis was used to determine the relationship between the scales. Interscale correlation coefficients; It was classified as very weak (0.00-0.25), weak (0.26-0.49), moderate (0.50-0.69), strong (0.70-0.89) and very strong (0.90-1.00).

2.5. Ethical Aspects of the Research

In order to conduct the research, the necessary written permissions were obtained from the scientific research and publication ethics committee of a university and the hospital where

the research would be conducted. Before collecting data, the purpose of the research and the purposes for which the results would be used were explained to the nurses. In addition, the principle of "Respect for Autonomy" was fulfilled by stating that whether or not to participate in the research was voluntary, and the principle of "Confidentiality and Protection of Confidentiality" was fulfilled by stating that the information of the nursing students participating in the research would be kept confidential. The research adhered to the Helsinki Declaration of Human Rights.

2.6. Limitations and generalizability of the research

Since the data was obtained through the survey method, the limitations of such research are also valid in this research and the findings can be generalized to the nursing students participating in the research.

3. RESULTS

Table 1. Distribution of nurses according to socio-demographic characteristics (n=404)

Age	Number	%
18-30	269	66.6
30-45	113	28
45 and over	22	5.4
Gender		
Woman	246	60.9
Male	158	39.1
Marital status		
Single	238	58.9
Married	166	41.1
Education level		
High school	21	5.2
Associate Degree	55	13.6
Licence	284	70.3
Postgraduate	44	10.9
Working Year		
0-3 year	37	9.2
4-6 year	215	53.2
7-9 year	82	20.3
10 year and above	70	17.3
How it works		
Shift	233	57.7
Daytime	171	42.3
Clinic where she works		
Internal services	59	14.6
Surgical services	50	12.4
Emergency room	67	16.6
Intensive care services	64	15.8
Other services	164	40.6

66.6% of the nurses participating in the study were between the ages of 18-30, 60.9% were

women, 58.9% were single, 70.3% had a bachelor's degree, 53.2% were in the 4-6 years of their

working years, 57.7% were women. It was found that 40.6% worked in shifts and 40.6% worked in

other services (Table 1).

Table 2. Nurses' Health Technologies Evaluation Attitude Scale and General Attitude Scale Towards Artificial Intelligence Score Averages (N=404)

Scales and Sub-Dimensions	$\bar{x} \pm SD$	Min	Max
Health Technologies Evaluation Attitude Scale	4.10±.552	1.95	5.00
Scope size	4.07±.693	1.50	5
Awareness dimension	4.29±.610	1.86	5
Benefit dimension	4.01±.590	2	5
General Attitude Scale Towards Artificial Intelligence	3.30±.539	1.60	4.94
Negative Attitude Towards Artificial Intelligence	3.61±.757	1	5
Positive Attitude Towards Artificial Intelligence	2.85±.835	1	5

The Health Technologies Evaluation Attitude Scale score of the officials included in the research was found to be 4.10±.552, and the General Attitude

Scale towards Artificial Intelligence score was 3.30±.539 (Table 2).

Table 3. Relationship Between Nurses' Health Technologies Evaluation Attitude Scale Scores and General Attitude Scale Towards Artificial Intelligence Score Averages

Scales	Health Technologies Evaluation Attitude Scale	General Attitude Scale Towards Artificial Intelligence
Health Technologies Evaluation Attitude Scale	R 1	.377**
	P	.000
General Attitude Scale Towards Artificial Intelligence	R .377**	1
	P .000	

** . Correlation is significant at the 0.01 level (2-tailed).

A positive, moderately significant relationship was found between the Nurses' Health Technologies Evaluation Attitude Scale Scores and the General Attitude Scale Towards Artificial Intelligence score averages ($p < 0.001$) (Table 3).

4. DISCUSSION

The Health Technologies Assessment Attitude Scale score of the nurses participating in the study was found to be 4.10±.552, and the General Attitude Scale score towards Artificial Intelligence was found to be 3.30±.539 (Table 2). In the study conducted by Çoban and Özcan (2023) to evaluate the perceptions of healthcare professionals on health technology, a statistically significant difference was found between the Health Technologies Assessment Attitude Scale and the sub-dimensions of the scale according to the professions of healthcare professionals [20]. The reason for the higher Health Technologies Assessment Attitude Scale scores of nurses in the study may be that they have received more

education on health technologies. As the level of education increases, attitudes towards technology generally become more positive. Having more information about health technologies may enable them to view these technologies more positively. In addition, in the study conducted by Kuşcu and Göde (2022), although the total Health Technologies Assessment Attitude Scale mean scores of doctors and managers were found to be higher than other healthcare professional groups, the mean score of nursing was also quite high [21]. It has been reported in the literature that clinicians are more sympathetic to health technology evaluation [22]. According to the literature, nurses, doctors and managers use health technologies more frequently and comprehensively in their daily work. For example, advanced medical devices used in diagnosis and treatment processes, electronic health records and telehealth services, such as technologies, can be an indispensable part of the work of doctors and managers. However, the reason why the study is compatible with the literature is that nurses receive continuous

education due to their profession and this education usually includes information about health technologies. In the education, detailed information is given about the use of health technologies, their advantages and their contributions to patient care.

In the study, a positive, moderately significant relationship was found between the nurses' Health Technologies Evaluation Attitude Scale Scores and the General Attitude Scale Towards Artificial Intelligence score averages ($p < 0.001$). This is because if nurses' attitudes towards technology in general are positive, these attitudes may also be reflected in more specific technologies such as health technologies and artificial intelligence. A positive general attitude can include positive expectations and an accepting attitude towards technology, which also includes health technologies and artificial intelligence. Nurses who are educated or aware of health technologies and artificial intelligence have a more positive attitude towards these technologies. Information and education can reduce negative prejudices about technology and help them develop a more positive perspective. By observing how technologies such as health technologies and artificial intelligence can make their jobs easier, nurses can develop a more positive attitude towards these technologies. The idea that, when used effectively, these technologies will improve workflow, increase efficiency, and improve patient care may encourage nurses to develop a positive perspective towards these technologies. Social and professional trends, along with the increasing use of technology in the healthcare sector, may also positively affect nurses' attitudes towards technology. It can be observed that especially the younger generation of nurses have a more open and positive attitude towards technology. The combination of these factors may explain the finding of a positive, moderately significant relationship between nurses' health technologies and artificial intelligence. It was determined that there was a significant relationship between nurses' attitudes towards evaluating health technologies and their attitudes towards artificial intelligence.

5. Conclusion

As a result of the research, it was determined that there was a moderate positive relationship between the attitude towards evaluating health technologies and the attitude towards artificial intelligence. It is thought that it is important to examine nurses' attitudes towards evaluating health technologies and their attitude towards

artificial intelligence as a whole. In this regard, training programs about health technologies and artificial intelligence should be organized for nurses. These programs should encourage nurses' use of technology and increase their confidence in technology. When developing products that suit the needs of nurses, health technology companies should take their feedback into account and include it in their product development processes. By collaborating with technology companies, nurses can provide consultancy to optimize the use of artificial intelligence applications.

Ethics Committee

This committee permission dated 21.11.2023 and numbered 117985 was obtained from the Scientific Research and Publication Ethics Committee of a state university.

Authors' Contribution Levels

Study Idea (Concept) and Design - CÖ; Data Collection / Literature Review - CÖ; Analysis and Interpretation of Data - CÖ; Preparation of the Article - CÖ; Approval of the Final Version to be Published - CÖ.

Peer Review

Externally independent.

Conflict of Interest

The author declared that he has no conflict of interest.

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