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Original Article

Artificial Intelligence Anxiety Levels of Faculty of Health Sciences Students and Affecting Factors

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What is already known on this topic?

- *The rapid integration of artificial intelligence (AI) into healthcare requires health sciences students to develop familiarity and competence, while factors such as perceived self-efficacy, exposure to technology, and AI's perceived complexity contribute to anxiety levels that may influence their adaptability to technological advancements in their future professions.*

What this study adds on this topic?

- *This study highlights that health sciences students experience high levels of AI anxiety, primarily due to a lack of knowledge, emphasizing the need for integrating theoretical and practical AI training modules into the curriculum to enhance competence and reduce anxiety.*
- *The findings suggest that implementing educational interventions such as simulation-based training, awareness campaigns, and research participation opportunities can help correct misconceptions, improve adaptability, and support healthcare professionals in effectively integrating AI into their practice.*

ABSTRACT

Objective: Artificial intelligence (AI) technology advancements are poised to bring significant changes to the healthcare field. As the adoption of AI systems in healthcare continues to grow, there is an increasing need to equip future healthcare professionals with the necessary knowledge and skills to work effectively with these technologies. This study explores the level of anxiety related to AI and examines the factors influencing this anxiety among university students enrolled in health sciences programs.

Methods: This cross-sectional study was descriptive and correlational. The study was carried out with 450 students at the İstanbul Gedik University, Faculty of Health Sciences (Department of Nursing, Physiotherapy and Rehabilitation, Child Development, Nutrition and Diet, Occupational Health and Safety). A descriptive questionnaire and an AI anxiety scale were used to obtain the research data, which were analyzed using numerical data, descriptive statistics, analysis of variance, independent groups *t*-test, and post-hoc analysis.

Results: The mean total score on the Artificial Intelligence Anxiety Scale (AIAS) was 109.642 ± 30.452 (min = 42; max = 147). Among the sub-dimensions of the AIAS, the mean of the Learning sub-dimension was 41.096 ± 12.083 (min = 16; max = 56), the mean of the Job Change sub-dimension was 31.118 ± 9.022 (min = 12; max = 42), the mean of the Sociotechnical Blindness sub-dimension was 21.558 ± 5.892 (min = 8; max = 28), and the mean of the AI Configuration sub-dimension was 15.871 ± 4.831 (min = 6; max = 21).

Conclusion: According to this study, students from the Faculty of Health Sciences had a high level of AI anxiety. Significant differences were found between students' AI anxiety levels according to gender, their thoughts about AI, their trust in AI-based devices, their desire to change their profession because of AI, and their use of AI in patient care.

Keywords: Anxiety, artificial intelligence, artificial intelligence anxiety, student health

Introduction

Rapid changes in artificial intelligence (AI) technologies significantly impact the health sector, as in all sectors.[1] Artificial intelligence is used in various areas such as early diagnosis and treatment, decision-making, education, research, health promotion, and protection in health services.[1,2] It is known that in the near future, healthcare professionals will frequently encounter applications integrated with various AI systems in clinical settings. Artificial intelligence in healthcare is predicted to have a striking impact on patient care in the future.[1,3] When examining the areas of application of AI in health disciplines, AI-based

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systems are being developed in physiotherapy and rehabilitation to enhance the effects of phenomena such as balance, walking, activities of daily living, and lower- and upper-extremity skills. In this context, the level of development of rehabilitation practices, prediction of clinical progress, and continuous follow-up are possible by evaluating patient output.[1,4] AI applications in nutrition and dietetics have demonstrated high accuracy in assessing nutrient intake, planning diets, identifying the relationship between diet and disease, and obtaining anthropometric measurements.[4] Similarly, AI holds significant potential in nursing. Given the shortage of nurses relative to the number of patients, AI can help reduce workload and save time by handling tasks such as paperwork and registration through integrated systems. By streamlining these administrative processes, nurses can dedicate more time to their primary role of providing direct patient care.[5] In this way, nurses will be able to provide better quality healthcare services with a holistic approach to people and more time for human values.[6] It is believed that today's university students will play an active role as future health professionals in health services integrated with AI, which is predicted to be realized in the future. Consequently, the perspectives and competencies of university health science students regarding AI are crucial for their future application in healthcare. A literature review reveals that medical students are concerned that AI may lead to job loss and present risks in patient care.[7] In studies conducted with students in the health sciences field, it was found that students have negative views, lack knowledge, and anxiety about AI.[4,8] It is significant to know the extent of the anxiety and assess the factors that influence it to eliminate these anxieties. When the literature is examined, it is observed that there are studies that address the concerns of nurses, nursing and medical students, and individuals belonging to different health disciplines about AI.[9-13] However, no studies cover all student groups studying in the field of health sciences, and they focus on determining the levels of AI anxiety by comparing these groups. There are studies examining the approaches and expectations of health sciences students toward AI.[4,8]

What this study adds on this topic?

This study highlights that health sciences students experience high levels of AI anxiety, primarily due to a lack of knowledge, emphasizing the need for integrating theoretical and practical AI training modules into the curriculum to enhance competence and reduce anxiety.The findings suggest that implementing educational interventions such as simulation-based training, awareness campaigns, and research participation opportunities can help correct misconceptions, improve adaptability, and support healthcare professionals in effectively integrating AI into their practice.This research will provide valuable information to support students' adaptation to AI and develop educational programs. In addition, students' psychological support needs can be determined in line with their anxiety levels, and strategies can be developed to facilitate their adaptation to this technology. Finally, students' attitudes toward AI play a critical role in adopting innovative practices in healthcare and improving service quality. This study was conducted to determine the level of AI anxiety and the factors affecting it among undergraduate students studying health (nursing, physiotherapy and rehabilitation, nutrition and dietetics, child development, occupational health, and safety). This descriptive cross-sectional study included health sciences students studying at a university.

Research Hypothesis

H_1: Students in the Faculty of Health Sciences have high levels of anxiety regarding AI.

H_2: There is a relationship between descriptive characteristics and AI anxiety levels of students in the Faculty of Health Sciences.

Methods

Research Design

This study was a descriptive, cross-sectional study.

Population and Sample of the Study

The study was conducted between April 2023 and December 2024 with 573 students (Department of Nursing, Physiotherapy and Rehabilitation, Child Development, Nutrition and Dietetics, Occupational Health and Safety) at the İstanbul Gedik University, Faculty of Health Sciences. No sampling was used in this study, and the aim was to reach the entire population. The study was completed by 450 health science students who agreed to participate and completed the questionnaire in full, and the response rate was 78.5%. Research data were collected online using Google Forms.

Data Collection Forms

Data for this study were collected using a Descriptive Characteristics Questionnaire and the Artificial Intelligence Anxiety Scale (AIAS).

Descriptive Characteristics Questionnaire

The Descriptive Characteristics Questionnaire was prepared by researchers[4,7,8,14] based on the literature. It consisted of 16 questions about gender, marital status, section, family type, ıncome level, dwelling unit, the most used technological device, daily use of technological devices, opinion on the impact of evolving technology on the health workforce, readiness to use AI in healthcare, trust in AI-based devices, the effectiveness of AI in patient care and treatment, preference for AI tools in patient care and treatment, prospects for the profession if AI becomes widespread in healthcare, and consideration of professional change as a result of the growth of AI-based devices in healthcare.

Artificial Intelligence Anxiety Scale

The AIAS was developed by Wang and Wang[15] and adapted to Turkish by Terzi[16]. The AIAS, an assessment tool, asks participants to reflect on their experiences. In the scale consisting of 21 questions, 7 Likert-type questions were answered on a scale of 1-7. The scale has 4 sub-dimensions. These are the learning, job change, sociotechnical blindness, and AI configuration sub-dimensions. The lowest and highest scores are 21 and 147, respectively. The increase in the score indicates that the AI's anxiety level also increased. Regarding the validity and reliability of the scale, Cronbach's α value was found to be 0.96.[16] In this study, this value was 0.984.

Data Collection

Data were collected by sending a link to the questionnaire created by the researchers using Google Forms. The first part of the questionnaire contained a voluntary consent form that included the purpose and scope of the study. The second part of the questionnaire included questions from the Descriptive Characteristics Questionnaire and AIAS. The responses of individuals who approved the consent form and answered the survey questions were analyzed. It took approximately 4-6 minutes to complete the survey.

Ethical Considerations

Ethical approval for the conduct of the study and all necessary permissions were obtained from İstanbul Gedik University Scientific Research Ethics Committee (Approval no: 466, Date: March 28, 2023). On the first page of the form prepared in the online environment, information about the purpose of the research and consent was included at the end of this information. Students who received information about the research and agreed to participate answered the questions after approving their consent. Permission to use AIAS was obtained from the author.

Statistical Analysis

The data obtained in this study were analyzed using the Statistical Package for Social Sciences version 22.0 software (IBM Corp.; Armonk, NY, USA). Frequency and percentage analyses were used to determine the descriptive characteristics of the students who participated in the study, and the mean and standard deviation statistics were used to examine the scale. Kurtosis and skewness values were analyzed to determine whether the research variables were normally distributed. Independent group *t*-tests, one-way analysis of variance (ANOVA), and post-hoc analyses (Tukey, LSD) were used to examine differences in the scale scores according to the descriptive characteristics of the students.

Limitations of the Study

This study had several limitations. This study cannot be generalized to all university students as it is a single-center study and is limited to the university's faculty where the study was conducted.

Results

An analysis of the descriptive characteristics of the students who participated in the study revealed that 55.3% were female, 94.7% were single, 83.1% belonged to a nuclear family, 61.6% had an income equivalent to expenses, 75.3% lived in metropolitan areas, and 31.8% were nursing students (Table 1). The most commonly used technological device was the telephone for 90.9% of the students, and 40.7% spent 4-6 hours a day using technological devices (Table 2).

The overall mean of the AIAS was 109.642 ± 30.452 (min = 42; max = 147). Among the sub-dimensions of the AIAS, the mean of the Learning sub-dimension was 41.096 ± 12.083 (min = 16; max = 56), the mean of the Work Change sub-dimension was 31.118 ± 9.022 (min = 12; max = 42), the mean of the Sociotechnical Blindness sub-dimension was 21.558 ± 5.892 (min = 8; max = 28), and the mean of the AI Configuration sub-dimension was 15.871 ± 4.831 (min = 6; max = 21) (Table 3).

Table 1. Distribution of Descriptive Characteristics of Students (N = 450)

Age: 21.090 ± 2.901		
Gender	n	%
Woman	249	55.3
Male	201	44.7
Marital status		
Married	24	5.3
Single	426	94.7
Department at the university		
Department of nursing	143	31.8
Physiotherapy and rehabilitation	120	26.7
Nutrition and dietetics	85	18.9
Child development	63	14.0
Occupational health and safety	39	8.7
Family type		
Nuclear family	374	83.1
Extended family	76	16.9
Income level		
Revenue less expenditure	100	22.2
Revenue equivalent to expenditure	277	61.6
Revenue exceeds expenditure	73	16.2
Dwelling unit		
Metropolitan	339	75.3
City	77	17.1
Village/town/district	34	7.6

Table 2. Distribution of Students' Thoughts on the Use of Technology and Artificial Intelligence (N = 450)

Most Used Technological Device	**n**	**%**
Telephone number	**409**	**90.9**
Tablet	7	1.6
Computers	27	6.0
Does not use	7	1.6
Daily use of technological devices		
2-4 hours	90	20.0
4-6 hours	**183**	**40.7**
6-8 hours	109	24.2
8 hours and more	68	15.1
Opinion on the impact of evolving technology on the health workforce		
Positive effects	**367**	**81.6**
Negative effects	60	13.3
Does not affect	23	5.1
Readiness to use AI in healthcare		
Yes	**272**	**60.4**
No	72	16.0
Undecided	106	23.6
Trust in AI-based devices		
Yes	178	39.6
No	78	17.3
Undecided	**194**	**43.1**
The effectiveness of AI in patient care and treatment		
Yes	**292**	**64.9**
No	60	13.3
Undecided	98	21.8
Preference for AI tools in patient care and treatment		
Yes	**233**	**51.8**
No	124	27.6
Undecided	93	20.7
Prospects for the profession if AI becomes widespread in healthcare		
Immutable	113	25.1
More time with the patient due to reduced workload	**178**	**39.6**
My sense of belonging to the profession is decreasing	50	11.1
I develop confidence problems with the equipment	109	24.2
Consideration of professional change as a result of the growth of AI-based devices in healthcare		
Yes	158	35.1
No	**180**	**40.0**
Undecided	112	24.9

AI, artificial intelligence. The values with the highest ratio are shown in bold.

There was no significant difference between the total score and the sub-dimension scores of the AIAS based on marital status, educational sector, income level, family type, housing unit, most frequently used technological device, and daily time spent using technological devices among the students participating in the study ($P > .05$).

When the relationship between students' AI anxiety levels and gender was analyzed, it was found that female students' total scores on the AIAS ($x = 106.767$) were lower than male students' total scores on the AIAS ($x = 113.204$) ($t = -2.239$; $P = .029 < .05$; $d = 0.212$; $\eta^2 = 0.011x$). When the subdimensions of the scale were evaluated, it was found that the learning subdimension scores of female students (=39.574x) were lower than those of male students (=42.980t) (=−2.999; $P = .003 < .05$; $d = 0.284$; $\eta^2 = 0.020x$), and the Job Change subscale scores of the female students (=30.185x) were lower than those of the male students (=32.274t) ($x = -2.455$, $P = .016 < .05$, $d = 0.233$, $\eta^2 = 0.013$). No

Table 3. Artificial Intelligence Anxiety Scale and Subscale Mean Scores (N = 450)

AIAS Subscales	Mean	SD	Min	Max	Kurtosis	Skewness	α
Learning sub-dimension	41.096	12.083	16.000	56.000	−1.048	−0.489	0.959
Job change sub-dimension	31.118	9.022	12.000	42.000	−0.870	−0.583	0.952
Sociotechnical blindness sub-dimension	21.558	5.892	8.000	28.000	−0.487	−0.823	0.951
AI configuration subdimension	15.871	4.831	6.000	21.000	−0.702	−0.773	0.973
AIAS total score	109.642	30.452	42.000	147.000	−0.800	−0.595	0.984

AI, artificial intelligence; AIAS, Artificial Intelligence Anxiety Scale; Max, maximum; Min, minimum.

significant differences were observed in the sociotechnical and AIAS configuration subdimensions according to gender ($P > .05$) (Table 4).

It was found that the total AIAS scores of the students who thought that developing technology would have a negative impact on the healthcare workforce were higher than those who thought that developing technology would have a positive impact on the healthcare workforce ($F = 7.909$; $P = 0 < .05$; $\eta^2 = 0.034$) ($P < .05$). Similarly, a significant difference was found in subscale scores ($P < .05$) (Table 4).

The total AIAS scores of students who did not want AI to be used in healthcare were higher than the total AIAS scores of students who wanted it to be used and were undecided ($F = 4.387$; $P = .013 < .05$; $\eta^2 = 0.019$) ($P < .05$). Similarly, a significant difference ($P < .05$) was found in the scale sub-dimension scores (Table 4).

A significant difference was found between students' trust in AI-based devices and their scores on the sociotechnical blindness subdimension of the AIAS ($F = 4.664$; $P = .01 < .05$; $\eta^2 = 0.020$). The sociotechnical subdimension scores of students who did not trust AI-based devices were higher than those who trusted AI-based devices ($P < .05$). In addition, the sociotechnical blindness subscale scores of students who were uncertain about trusting AI-based devices were higher than those of students who trusted them ($P < .05$) (Table 4).

A significant difference was found between the students' views on the effectiveness of AI in patient care and treatment and the total and subdimension scores of the AIAS ($F = 4.428$; $P = .012 < .05$; $\eta^2 = 0.019$). The total AIAS scores were higher among those who believed that AI would not be effective in patient care and treatment than among those who believed that AI would be effective in patient care and treatment. Similarly, a significant difference was found in the subscale scores of the scales (Table 4).

Significant differences were found between students' preference for AI tools in patient care and treatment and the AIAS total score, job change sub-dimension, sociotechnical blindness sub-dimension, and AI configuration sub-dimension scores. The total AIAS of those who did not prefer AI tools in patient care and treatment was higher than the AI scores of those who preferred AI tools in patient care and treatment. Similarly, for the sociotechnical blindness and job change subdimensions of the AIAS, the scores of those who did not prefer AI tools in patient care and treatment were higher than those who preferred AI tools in patient care and treatment (Table 4).

When students' perspectives on the profession were assessed in the event of widespread use of AI in healthcare, the total AIAS scores of those who thought their perspective on the profession would not change were higher than those of who thought the time spent with patients would increase due to the decrease in workload. It was found that the total AIAS of students who thought that their affiliation to the profession would decrease was higher than those who thought that the time spent with patients would increase due to the decrease in workload. Significant differences were also found in the subscale scores. Similarly, a significant difference was found in the subscale scores (Table 4).

Significant differences were found when evaluating the total and subdimension scores of the AIAS and students' thoughts about changing their profession due to the increase in AI-based devices in the healthcare sector. It was found that the total AIAS of the students considering changing their profession due to the proliferation of AI-based devices was higher than those who did not consider changing their profession and were undecided. Similarly, a statistically significant difference was observed in the subscale scores (Table 4).

Discussion

Artificial intelligence is used in different areas of healthcare, such as virtual medical assistants, automated image diagnosis, personal health assistants, oncology, cardiology, radiology, and AI-supported chatbots, and is becoming more widespread every day.[1,2] The fact that AI is replacing human labor in the delivery of healthcare services is often perceived as a danger by healthcare professionals.[12,17] This study was conducted to determine the level of AI anxiety among university students studying health sciences and the factors that influence it.

With the swift integration of AI into our daily lives, various expectations and concerns have arisen in society. Some believe that AI will simplify life and enhance access to healthcare services.[18,19] Conversely, numerous researchers worry about its potential negative impact on humanity.[20,21] When the literature was examined, it was stated that AI anxiety was at a moderate level in studies conducted with nursing students.[7] Yigit and Acikgoz[10] (2024) reported that the level of AI anxiety of nursing students was high. Studies evaluating the AI anxiety of nursing students according to health sciences students studying in different departments are limited. As potential users of AI-based technologies, nurses and nursing students are in a unique position to influence and lead the implementation of AI in the nursing sector[2] Thus, it is significant to determine users' perceptions of new technologies such as AI-based technology in healthcare and to compare different disciplines in the field of health sciences.[9] In this study, it was determined that students' AI anxiety levels did not differ according to the departments studied at the university. Filiz et al[12] (2022) state that health professionals have moderate concerns about using AI. In a study on the anxiety level of general practitioners toward AI, it was found that they had moderate anxiety.[17] In a study conducted with medical students, it was reported that students had low levels of AI anxiety.[22] The data from our study are similar to those reported in the literature. It can be assumed that the widespread use of AI in the field of health will increase students' anxiety levels.[12,23]

Male students in the study were more anxious about AI than female students. In a study investigating teachers' anxiety levels regarding AI, male teachers were found to have lower anxiety levels than female teachers.[24] On the other hand, in a study examining the AI readiness levels of nurses, the readiness level of male nurses was found to be higher than that of women[13], and in a study conducted with nursing

Table 4. Comparison of Students' Descriptive Characteristics and Artificial Intelligence Anxiety Scale Mean Scores (N = 450)

Identifying Features	n	AIAS Total Mean ± SD	Learning Sub-Dimension Mean ± SD	Job Change Sub-Dimension Mean ± SD	Sociotechnical Blindness Subdimension Mean ± SD	AI Configuration Sub-Dimension Mean ± SD
Gender						
Woman	249	106.767 ± 27.806	39.574 ± 11.183	30.185 ± 8.221	21.378 ± 5.551	15.631 ± 4.607
Male	201	113.204 ± 33.168	42.980 ± 12.893	32.274 ± 9.824	21.781 ± 6.297	16.169 ± 5.090
t		−2.239	−2.999	−2.455	−0.722	−1.176
P		**.029**	**.003**	**.016**	.477	.240
Section						
Nursing care	143	110.692 ± 30.048	41.441 ± 11.816	31.427 ± 9.022	21.734 ± 5.935	16.091 ± 4.624
Physiotherapy and rehabilitation	120	104.325 ± 32.345	39.267 ± 12.742	29.292 ± 9.553	20.775 ± 6.214	14.992 ± 5.249
Nutrition and dietetics	85	115.153 ± 27.586	43.412 ± 11.138	32.847 ± 8.310	22.282 ± 5.096	16.612 ± 4.215
Child development	63	112.000 ± 28.398	41.333 ± 11.769	31.952 ± 8.166	22.286 ± 5.709	16.429 ± 4.754
Occupational health and safety	39	106.333 ± 33.577	40.026 ± 13.054	30.487 ± 9.550	20.564 ± 6.480	15.256 ± 5.354
F		1.877	1.588	2.259	1.406	1.952
P		.113	.176	.062	.231	.101
Opinion on the impact of evolving technology on the health workforce						
Positive effects	367	107.447 ± 30.850	40.292 ± 12.215	30.463 ± 9.153	21.210 ± 5.993	15.482 ± 4.941
Negative effects	60	124.950 ± 21.190	46.750 ± 9.057	35.500 ± 6.601	24.150 ± 4.108	18.550 ± 2.752
Does not affect	23	104.739 ± 33.822	39.174 ± 13.252	30.130 ± 9.493	20.348 ± 6.624	15.087 ± 5.204
F		9.153	7.909	8.453	7.120	11.204
P		**.000**	**.000**	**.000**	**.001**	**.000**
Post hoc		2 > 1, 2 > 3 (*P* < .05)	2 > 1, 2 > 3 (*P* < .05)	2 > 1, 2 > 3 (*P* < .05)	2 > 1, 2 > 3 (*P* < .05)	2 > 1, 2 > 3 (*P* < .05)
Willingness to use AI in healthcare						
Yes	272	107.121 ± 31.340	40.265 ± 12.352	30.452 ± 9.333	20.919 ± 6.154	15.485 ± 4.932
No	72	118.986 ± 28.519	44.708 ± 11.384	33.806 ± 8.480	23.306 ± 5.296	17.167 ± 4.299
Undecided	106	109.764 ± 28.359	40.774 ± 11.492	31.000 ± 8.277	22.009 ± 5.330	15.981 ± 4.793
F		4.387	3.950	3.997	5.171	3.523
P		**.013**	**.020**	**.019**	**.006**	**.030**
Post hoc		2 > 1, 2 > 3 (*P* < .05)	2 > 1, 2 > 3 (*P* < .05)	2 > 1, 2 > 3 (*P* < .05)	2 > 1 (*P* < .05)	2 > 1 (*P* < .05)
Trust in AI-based devices						
Yes	178	106.978 ± 34.384	40.506 ± 13.461	30.494 ± 9.977	20.607 ± 6.620	15.371 ± 5.310
No	78	116.974 ± 29.100	44.013 ± 11.712	33.205 ± 8.681	22.872 ± 5.332	16.885 ± 4.507
Undecided	194	109.139 ± 26.586	40.464 ± 10.705	30.851 ± 8.113	21.902 ± 5.253	15.923 ± 4.436
F		2.995	2.772	2.616	4.664	2.703
P		.051	.064	.074	**.010**	.068
Post hoc					2 > 1, 3 > 1 (*P* < .05)	
The effectiveness of AI in patient care and treatment						
Yes	292	106.798 ± 32.153	40.041 ± 12.627	30.281 ± 9.588	21.045 ± 6.258	15.432 ± 5.118
No	60	118.650 ± 27.392	44.517 ± 11.257	33.450 ± 8.037	23.117 ± 5.266	17.567 ± 3.916
Undecided	98	112.602 ± 25.523	42.143 ± 10.426	32.184 ± 7.422	22.133 ± 4.871	16.143 ± 4.204
F		4.428	3.936	3.998	3.718	5.153
P		.012	.020	.019	.025	.006
Post hoc		2 > 1 (*P* < .05)	2 > 1 (*P* < .05)	2 > 1 (*P* < .05)	2 > 1 (*P* < .05)	2 > 1 (*P* < .05)
Preference for AI tools in patient care and treatment						
Yes	233	106.185 ± 33.221	40.000 ± 13.049	30.116 ± 9.798	20.846 ± 6.426	15.223 ± 5.206
No	124	113.863 ± 28.163	42.637 ± 11.324	32.137 ± 8.492	22.452 ± 5.467	16.637 ± 4.596
Undecided	93	112.677 ± 24.876	41.785 ± 10.246	32.269 ± 7.313	22.151 ± 4.757	16.473 ± 3.883
F		3.186	2.129	3.012	3.642	4.444
P		.042	.120	.050	.027	.012
Post hoc		2 > 1 (*P* < .05)		2 > 1 (*P* < .05)	2 > 1 (*P* < .05)	2 > 1, 3 > 1 (*P* < .05)
Prospects for the profession if AI becomes widespread in healthcare						
Immutable	113	116.761 ± 30.705	44.584 ± 11.768	33.443 ± 8.906	22.204 ± 6.017	16.531 ± 4.660
More time with the patient due to reduced workload	178	102.607 ± 32.117	38.191 ± 12.673	29.090 ± 9.452	20.478 ± 6.239	14.848 ± 5.218
My sense of belonging to the profession is decreasing	50	119.280 ± 23.125	44.300 ± 9.826	34.100 ± 6.756	23.340 ± 4.588	17.540 ± 3.748

(*Continued*)

Table 4. Comparison of Students' Descriptive Characteristics and Artificial Intelligence Anxiety Scale Mean Scores (N = 450) (*Continued*)

Identifying Features	n	AIAS Total Mean ± SD	Learning Sub-Dimension Mean ± SD	Job Change Sub-Dimension Mean ± SD	Sociotechnical Blindness Subdimension Mean ± SD	AI Configuration Sub-Dimension Mean ± SD
I develop confidence problems with the equipment	109	109.330 ± 27.692	40.752 ± 11.175	30.651 ± 8.500	21.835 ± 5.436	16.092 ± 4.471
F		7.184	8.140	7.751	4.137	5.594
P		.000	.000	.000	.007	.001
Post hoc		1 > 2, 3 > 2 (*P* < .05)	1 > 2, 3 > 2, 1 > 4 (*P* < .05)	1 > 2, 3 > 2, 1 > 4, 3 > 4 (*P* < .05)	1 > 2, 3 > 2 (*P* < .05)	1 > 2, 3 > 2, 4 > 2 (*P* < .05)
Thinking of changing professions due to the rise of AI-based devices in healthcare						
Yes	158	120.196 ± 27.738	45.228 ± 11.229	34.241 ± 8.163	23.298 ± 5.354	17.430 ± 4.246
No	180	102.944 ± 31.512	38.650 ± 12.336	29.117 ± 9.377	20.406 ± 6.115	14.772 ± 5.133
Undecided	112	105.518 ± 28.515	39.196 ± 11.366	29.929 ± 8.451	20.955 ± 5.724	15.438 ± 4.561
F		15.854	15.216	15.847	11.420	14.118
P		.000	.000	.000	.000	.000
Post hoc		1 > 2, 1 > 3 (*P* < .05)	1 > 2, 1 > 3 (*P* < .05)	1 > 2, 1 > 3 (*P* < .05)	1 > 2, 1 > 3 (*P* < .05)	1 > 2, 1 > 3 (*P* < .05)

AI, artificial intelligence, AIAS, Artificial Intelligence Anxiety Scale, *F,* ANOVA test; *t,* independent groups *t*-test; *P* < .05. Those with high *p* values are marked in bold.

students, it was found that women's AI anxiety levels were higher than men.[7] The fact that this finding of our study differs from the literature may be due to the difference in sampling.

With the development of technology, there have been differences in the social lives of individuals. Interpersonal communication and social life have transformed with smartphones and computers. Young people spend time on social media through smartphones instead of with family and social environments. It is stated that 67.3% of young people use smartphones to connect to social media.[25] It was discovered that almost all the students who participated in this study used the phone as the most used technological device, and almost half spent 4-6 hours a day using it. Owing to the games and applications developed with AI, the time spent by young people on their phones is increasing, creating addiction.[26,27] The presence of AI applications on smartphones and the large amount of time spent suggests that students use AI applications in their daily lives.

Challenges and barriers to the adoption of AI technologies in healthcare have often been highlighted. Identifying barriers and developing new perspectives regarding the acceptance of developing technologies is necessary.[1,28] In this study, students who believed that developing technology would have a negative impact on the health workforce had higher levels of artificial anxiety than those who believed that it would have a positive or no impact. When reviewing the literature, it has been found in different studies that students of medicine, dentistry, nursing, and health sciences think that developing technology may cause unemployment and experience anxiety.[4,8,14] In a study conducted by Uçar et al[29] (2024), it was stated that there was a moderate relationship between the AI anxiety levels of university students and unemployment anxiety. In a study conducted with students in the health sciences field, they stated that the increasing use of AI will reduce the need for health workers in the future and that this situation creates job anxiety for them.[4] This situation indicates that the rapid development of technology has a negative impact on future health professionals, increasing anxiety about AI[7,13] On the other hand, in a study conducted with operating theater nurses, it was revealed that more than half of the nurses believed that robots and AI would reduce their workload.[5] Silveira Thomas Porto and Çatal[6] (2021) reported that operating theater nurses had a positive opinion toward robotic surgery in their study. These findings showed that perceptions about AI are shaped depending on individuals' professional expectations and experiences. In particular, it can be said that the job-finding concerns of students studying in the health field increase their concerns about AI, while surgical nurses perceive AI more positively due to its effects on reducing their workload. This situation reveals the importance of considering individuals' occupational positions and needs when evaluating the adoption and impact of AI technologies.

The application of AI in the provision of health services increases efficiency, helps the diagnostic process, and prevents malpractice.[3] This study observed that students who did not want to use AI in the health sector had a higher level of anxiety about AI than those who wanted to use it and those who were undecided. In a literature review, medical students stated that they wanted to use AI in their professional lives and that AI applications in health would provide convenience in their profession.[30,31] In a study evaluating the opinions of health students regarding AI, students were willing to use AI in their work environments.[4] In a study conducted with health science students, students stated that AI would reduce work stress.[8] On the other hand, in different studies conducted with students studying in the field of health sciences, it is stated that students are concerned about the use of AI technologies in the health sector[4,8,14] When evaluating the literature, it can be seen that both positive and negative opinions are reported. This situation may be due to the lack of knowledge about AI technologies.[9,13,32]

It was found that students who did not trust AI-based devices had higher scores on the sociotechnical blindness subdimension of the AIAS than those who did trust and those who were undecided. In a study conducted with medical students, it was found that students perceived the use of AI in medicine as risky for patients.[14] Conversely, in a study involving health sciences students, participants expressed that, in the future, artificial organs could be utilized. Autonomous surgical procedures might be carried out without human intervention. They also suggested that advancements in AI technologies within the healthcare sector could lead to higher success rates in patient treatment.[8] The lack of knowledge and skills of individuals in the field of AI can cause anxiety.[33,34] When evaluating the research and literature, it is believed that students' lack of knowledge and skills in AI causes anxiety.

Healthcare professionals have expressed hope that the integration of AI into the healthcare system will provide accurate diagnosis,[11] effective patient follow-up, accelerate the healing process, prevent malpractice,[35] and increase access to care in regions where healthcare

is inadequate.[7,35] In our study, AI anxiety levels were higher among students who thought AI would not be effective in patient care and treatment compared to those who thought it would be effective. Additionally, the AI anxiety levels of students who did not prefer AI tools in patient care and treatment were higher than those of students who preferred them and those who were undecided. A literature review suggests that when students use AI applications effectively, their attitudes toward AI develop positively.[11,33-35] It is suggested that the development of positive student attitudes toward the use of AI in patient care and treatment may be possible by addressing the lack of knowledge about AI and ensuring its use in practice.[13]

The rapid development of AI algorithms and systems integrated with robotic technology has raised concerns about job loss among individuals. Predictions suggest that integrating robots into the workplace may lead to higher unemployment rates, as automation in the production sector could render human labor less necessary. In a study by Doğaner[8] (2021) involving health sciences students, participants expressed concerns that AI could replace numerous job roles in the future, potentially leading to increased unemployment. Among the students who participated in this study, those who stated that their view of the profession would not be affected if AI became widespread in health services had a high level of AI anxiety. Significantly, the AI anxiety levels of students who did not plan to change their profession due to the increase in AI-based devices in healthcare were higher than those of undecided students who planned to change their profession. Even though the students stated that they did not have a career perspective and were not thinking of changing their careers due to the proliferation of AI, it can be seen that their AI anxiety levels were higher than those of other students.

Conclusion

In our study, health science students had high levels of AI anxiety, with no significant differences between departments. The rapid development of AI and its integration into healthcare have heightened anxiety levels among healthcare professionals about the future. Although many aspects of AI facilitate the delivery of healthcare services, it can be said that a lack of knowledge causes anxiety in students.

In line with the results of our research, theoretical and practical training modules on AI technologies should be added to the course curriculum to eliminate the lack of knowledge about AI and reduce anxiety in health sciences faculties. Experimental research can be conducted to evaluate the effectiveness of training programs, simulation studies, or awareness campaigns in reducing AI anxiety. Information campaigns can be organized to correct misconceptions regarding AI. Students should be encouraged to participate in research projects related to AI to increase their knowledge and skills in this field. In future studies, examining the concerns and attitudes of different health professional groups, such as nurses, doctors, and technicians, toward AI is recommended. Developing policies that support the adaptation of healthcare professionals to AI applications is also significant.

Availability of Data and Materials: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: Ethics committee approval was received for this study from the Ethics Committee of İstanbul Gedik University (Approval no: 466, Date: March 28, 2023).

Informed Consent: Written informed consent was obtained from participants who participated in this study.

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