

Nursing Students' Attitudes Toward Artificial Intelligence, Technology, and Internet Addiction: A Descriptive and Relational Study

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Abstract

Background: The increasing integration of artificial intelligence (AI) in healthcare has highlighted the importance of nursing students' attitudes toward these technologies. In this context, technology and internet addiction may act as influential factors shaping these attitudes.

Aim: This study aimed to determine the levels of technology addiction, internet addiction, and attitudes toward AI among nursing students, and to examine the relationships between these variables.

Methods: This descriptive and correlational study was conducted with 608 nursing students enrolled at the Faculty of Nursing of Gazi university. Data were collected face-to-face. The Spearman correlation test, Mann-Whitney U test, and Kruskal-Wallis H test were used for data analysis.

Results: The mean age of the students was 20.72±2.11 years; 84.0% were female, 28.9% were first-year students, and 37.5% had a moderate grade point average (GPA) [2.50–3.00]. AI was used by 84.4% of the students, primarily for homework (56.5%). A strong positive correlation was found between internet addiction and technology addiction, whereas negative attitudes toward AI were weakly and negatively correlated with these addictions. Male students had higher technology addiction scores, and AI users demonstrated significantly more positive attitudes toward AI.

Conclusion: The majority of nursing students reported using AI, primarily for homework purposes. They demonstrated low levels of internet addiction and moderate levels of technology addiction. These findings suggest that the conscious and ethical use of AI should be promoted in nursing education, along with increased awareness initiatives addressing technology addiction.

Keywords: Artificial intelligence, digital addiction, nursing education, quantitative methods, technology

Introduction

Rapid technological developments have profoundly affected individuals' daily habits and educational systems.¹ Especially in applied fields such as nursing, students rely heavily on the internet and mobile devices for both theoretical and clinical training.^{2,3} For example, Khalil et al.⁴ reported that 38.4% of nursing students had moderate internet addiction and 2.1% had severe internet addiction. However, such widespread use also increases the risk of internet and technology addiction.⁵

Internet addiction involves uncontrolled and persistent internet use that can negatively affect academic performance and overall well-being.^{6,7} Technology addiction refers to the excessive use of digital devices, which may disrupt communication and learning processes.^{8,9} Artificial intelligence (AI), on the other hand, involves the simulation of human intelligence by machines and is increasingly utilized in healthcare to improve diagnostic accuracy, optimize workflows, and support clinical decision-making.^{10,11} In nursing education, students' attitudes toward AI influence how effectively they adopt and utilize these technologies in their future professional practice.^{11,12} Recent studies from Türkiye further emphasize this point. For instance, Gülirmak Güler and Şen Atasayar¹³ found that nursing students' attitudes toward AI were significantly associated with their creative personality traits, highlighting how individual characteristics can shape readiness for AI integration into nursing practice. Additionally, recent studies suggest that individuals with higher levels of technology dependence tend to exhibit more favorable attitudes toward AI applications.¹⁴ For example, Farghaly Abdelaliem et al.¹ reported that nursing students with high levels of smart device dependency had more positive perceptions of AI.

These findings suggest a potential relationship between technology addiction and attitudes toward AI. However, internet and technology addiction are also associated with negative academic and psychological outcomes, such as absenteeism, fatigue, poor concentration, and reduced academic performance.^{1,3,6,8} In a study conducted in Türkiye, students with high levels of internet addiction demonstrated lower academic achievement and increased fatigue.³ Celikkalp et al.⁹ also reported that technology addiction negatively affects communication skills and emphasized that this addiction poses a threat to both learning processes and professional competencies. Moreover, addiction may affect not only academic success but also clinical decision-making and empathetic communication—key components of nursing education.^{6,8,14}

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With the expansion of digital health, AI technologies are becoming increasingly integrated into nursing practice. From monitoring systems to decision-support tools, the use of AI can improve care quality and reduce workload.^{1,10,11} Although these variables have demonstrated significant impacts, most studies continue to examine internet addiction, technology addiction, or attitudes toward AI independently. For example, Farghaly Abdelaliem et al.¹ addressed smart device use and AI perception but did not examine internet addiction. Akca Sumengen et al.¹¹ explored attitudes toward AI without considering digital usage behaviors. Recent studies further illustrate this gap: Sağlam et al.¹⁵ examined AI usage and AI-less phobia but did not address technology addiction, while Arslan et al.¹⁶ linked attitudes toward AI to social media use. Han et al.¹⁷ and Ali et al.¹⁸ investigated AI use and digital behaviors among nursing students; however, neither study examined internet addiction, technology addiction, and attitudes toward AI together within an integrated model.

Therefore, this study aims to address this gap by examining the interrelationships among internet addiction, technology addiction, and attitudes toward AI among nursing students. By identifying patterns and correlations among these variables, the study seeks to provide a more holistic understanding of how digital dependencies may influence readiness to engage with emerging technologies in healthcare. Ultimately, this research provides insights that may guide curriculum development and the design of educational strategies aimed at balancing technology use with professional competency development.

Aim of the Study

This study aimed to determine the levels of technology addiction, internet addiction, and attitudes toward AI among nursing students, as well as the relationships among these variables.

Research Questions

- What is the level of technology addiction among nursing students?
- What is the level of internet addiction among nursing students?
- What is the level of nursing students' attitudes toward AI?
- What is the relationship among technology addiction, internet addiction, and attitudes toward AI in nursing students?

Materials and Methods

Study Design

This study employed a descriptive and correlational design.

Population and Sample

The study population consisted of 1,011 nursing students enrolled at the Faculty of Nursing of Gazi university in Ankara. An a priori power analysis was conducted to determine the required sample size. The analysis, performed using G*Power 3.1 software, was based on a correlational research design and informed by the study conducted by Farghaly Abdelaliem et al.¹ For a two-tailed Pearson correlation analysis, assuming a moderate effect size ($r=0.30$), a significance level of 5% ($\alpha=0.05$), and a statistical power of 95% ($1-\beta=0.95$), the minimum required sample size was calculated as 138 participants. As the study aimed to reach the entire student population, all nursing students were invited to participate. As the study aimed to reach the entire student population, all nursing students were invited to participate. Although the minimum required sample size was calculated as 138 based on power analysis, a total of 608 students who met the inclusion criteria were included in the analysis. The statistical power of the study was above 0.99, indicating high reliability. This approach is widely accepted in cross-sectional descriptive studies and enhances both the generalizability and statistical reliability of the findings.¹⁹ Moreover, recent studies on sample planning and power analysis in nursing research emphasize that expanding the sample through voluntary participation is methodologically appropriate and acceptable.²⁰⁻²² Although a small number of international students were enrolled in the program, they were not included in the study because they did not participate.

The inclusion criteria were being a nursing student and voluntarily agreeing to participate in the study. The exclusion criterion was incomplete or improperly completed questionnaires.

Data Collection Tools

The research data were collected using a questionnaire consisting of two sections: (1) a demographic information form developed by the researchers and (2) validated scales adapted from the literature. The first section included eight questions related to the students' descriptive characteristics: age, gender, grade level, cumulative grade point average (GPA), daily internet usage time (minutes), daily technology usage time (minutes), whether they had received education about AI, and whether they believed AI should be included in nursing education.

The second section included the following instruments: the Internet Addiction Scale (IAS), the Technology Addiction Scale (TAS), and the General Attitude Toward Artificial Intelligence Scale (GATAIS).

Internet Addiction Scale (IAS)

The scale, originally developed by Hahn and Jerusalem²³ and adapted into Turkish by Sahin and Korkmaz,²⁴ consists of 19 items. It includes three subdimensions: "loss of control," "desire to stay online longer," and "negativity in social relationships." The IAS is a five-point Likert-type scale, with the following response options: "Never (1)," "Rarely (2)," "Sometimes (3)," "Usually (4)," and "Always (5)." Loss of control refers to various problems caused by excessive internet use and the inability to stop using it. Desire to stay online longer indicates the amount of time spent online. Negativity in social relationships refers to interpersonal problems with other people resulting from excessive internet use. The total score obtainable from the scale ranges from 19 to 95. Higher scores indicate higher levels of internet addiction. The Cronbach's alpha (α) coefficient for the Turkish adaptation of the scale was reported as 0.85.24 In the present study, the Cronbach's alpha coefficient was 0.92.

Technology Addiction Scale (TAS)

The Technology Addiction Scale, developed based on Young's²⁵ Internet Addiction Test criteria and Griffiths'²⁶ study, was adapted into Turkish by Aydın.²⁷ The scale consists of 24 items and includes four subdimensions: Social Network Addiction (6 items), Instant Messaging Addiction (6 items), Online Game Addiction (6 items), and Website Addiction (6 items). The TAS is a five-point Likert-type scale. Each behavior is scored as follows: "1"=never, "2"=rarely, "3"=moderately often, "4"=very often, and "5"=always. For each subdimension, the minimum possible score is 6 and the maximum is 30. The total score for the entire scale ranges from 24 to 120. When interpreting total scores, the following categories are used:

- 24-48: Low level of addiction
- 49-72: Moderate level of addiction
- 73-96: High level of addiction
- 97-120: Very high level of addiction.

Scores below 24 were defined as "not addicted".²⁷ In the present study, the Cronbach's alpha coefficient was 0.93.

General Attitude Toward Artificial Intelligence Scale (GATAIS)

The GATAIS, developed by Schepman and Rodway²⁸ and adapted into Turkish by Kaya et al.,²⁹ consists of 20 items. The scale includes two subdimensions: positive attitudes toward AI (12 items) and negative attitudes toward AI (8 items). The GATAIS is a five-point Likert scale scored as follows: strongly agree (5), agree (4), undecided (3), disagree (2), and strongly disagree (1). Items 13-20, which measure negative attitudes, are reverse-coded during scoring. A minimum score of 12 and a maximum score of 60 can be obtained from the Positive Attitude Toward AI (Positive GAAI) subdimension. In contrast, the Negative Attitude Toward AI (Negative GAAI) subdimension yields scores ranging from 8 to 40. An increase in the Positive GAAI subdimension score indicates a more positive attitude toward AI. Higher scores on the Negative GAAI subdimension indicate lower levels of negative attitudes toward AI. In the original study, the Cronbach's alpha (α) coefficient was reported as 0.88 for the Positive GAAI and 0.83 for the Negative GAAI.²⁸ In the Turkish adaptation, the Cronbach's alpha values were 0.82 for the Positive GAAI and 0.84 for the Negative GAAI.²⁹ In the present study, the overall Cronbach's alpha coefficient for the scale was 0.83.

Dependent and Independent Variables of the Study

Students' descriptive characteristics were considered independent variables, whereas attitudes toward AI, technology addiction levels, and internet addiction levels were considered dependent variables.

Data Collection

Data were collected face-to-face between February 15 and April 20, 2025. Prior to data collection, the researchers visited each class and informed the course instructors about the study. After explaining the purpose of the study, the data collection procedure, and the expected outcomes, written informed consent was obtained from the students who agreed to participate. The completion of the data collection instruments took approximately 10–15 minutes.

Data Analysis

The data were analyzed using IBM SPSS Statistics version 27.0 (IBM Corp., Armonk, NY, USA). Descriptive data were presented as numbers, percentages, minimum and maximum values, means, and standard deviations. The normality of the data distribution was assessed using the Kolmogorov-Smirnov test, as well as skewness and kurtosis coefficients. Since the variables did not demonstrate normal distribution, the Spearman correlation test was used to examine the relationships among variables. For intergroup comparisons, the nonparametric Mann-Whitney U test was used to evaluate differences between two groups, and the Kruskal-Wallis H test was used to compare three or more groups. Statistical significance was set at $p < 0.05$.

Ethical Approval

Ethical approval was obtained from the Gazi University Ethics Committee (Approval Number: E-77082166-604.01-1130133, Date: 24.12.2024). Following ethical approval, written permission was obtained from the Faculty of Nursing of Gazi university. Written informed consent was obtained from the students after providing detailed information about the purpose, procedures, and expected outcomes of the study. Participation was voluntary, and no identifying information (such as names or student numbers) was collected. The researchers were not aware of which students participated. To minimize any perception of pressure, the questionnaires were collected by independent researchers rather than faculty members involved in the students' education. This procedure helped prevent any potential conflict of interest between the researchers and the student participants. The study commenced after all necessary approvals had been obtained. Permission to use the measurement scales was obtained via email from the original scale developers. The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. The authors did not use generative AI technologies (e.g., ChatGPT, large language models [LLMs], chatbots, or image generators) during the design, data analysis, or writing of the manuscript. A language editing tool (Grammarly) was used solely for grammar and language editing purposes.

Results

The mean age of the participants was 20.72±2.11 years, and 84.0% were female. Among the students, 28.9% were in the first year, and 37.6% reported a moderate academic GPA (2.50–3.00). The average daily internet usage was 281.92±122.70 minutes, while the average daily technology usage was 316.51±143.69 minutes. Additionally, 84.4% of students reported using AI, with 56.5% of those using it specifically for completing homework (Table 1).

The mean internet addiction score was 43.98±13.07, and the mean technology addiction score was 51.66±17.23. The mean total score for general attitude toward AI was 67.32±9.54. For the subdimensions, the mean positive attitude score was 42.60±7.47, while the mean negative attitude score was 24.72±5.76 (Table 2).

Table 3 presents the correlations between internet addiction, technology addiction, and general attitudes toward AI, including their subscales. A strong positive correlation was found between internet addiction and technology addiction ($r=0.773$; $p<0.01$). A low-level negative correlation was observed between negative attitudes toward AI and both internet addiction ($r=-0.206$; $p<0.01$) and technology addiction ($r=-0.191$; $p<0.01$). A low-level positive correlation was also found between positive attitudes toward AI and internet addiction ($r=0.142$; $p<0.01$) (Table 3).

The mean technology addiction score was significantly higher in male students ($\chi^2=58.09\pm20.38$) compared to female students ($\chi^2=50.44\pm16.30$) ($U=19441.0$, $p<0.01$). According to students' academic year, no significant differences were found in internet addiction ($H=5.9533$, $p=0.1139$) or technology addiction ($H=7.6486$, $p=0.0539$). However, a significant difference was found in attitudes toward AI by grade level ($H=40.6232$, $p<0.01$), with the highest attitude scores

Table 1. Distribution of students according to descriptive characteristics (n=608)

Characteristics	Min-Max	Mean±SD
Age	17–45	20.72±2.11
Daily internet use (minutes)	45–960	281.92±122.70
Daily technology use (minutes)	50–960	316.51±143.69
	n	%
Gender		
Female	511	84.0
Male	97	16.0
Academic year		
1 st year	176	28.9
2 nd year	149	24.5
3 rd year	140	23.0
4 th year	143	23.6
GPA		
<2.50 (low)	115	18.9
2.50–3.00 (moderate)	228	37.6
3.01–3.50 (good)	193	31.7
>3.50 (very good)	72	11.8
Received AI training		
Yes	18	3.0
No	590	97.0
Source of AI training (n=18)		
Online platforms	8	44.4
Undergraduate courses	7	38.9
Certified programs	3	16.7
AI usage status		
Uses AI	513	84.4
Does not use AI	95	15.6
Source of learning about AI (n=513)		
Social environment (friends)	182	35.4
Internet	186	36.3
Social media	124	24.2
Undergraduate courses	21	4.1
Purpose of AI use* (n=513)		
Doing homework	290	56.5
General curiosity/multiple topics	116	22.6
Academic research/accessing information	111	21.6
Entertainment	41	7.9
Learning English	7	1.3
Should AI be included in undergraduate education		
Yes	406	66.8
No	36	5.9
Undecided	166	27.3

*: Multiple responses were allowed. Min: Minimum, Max: Maximum, SD: Standard deviation.

observed in 4th-year students ($\chi^2=70.72\pm9.82$) and the lowest in 1st-year students ($\chi^2=64.70\pm9.42$) (Table 4).

While it was found that participants' internet ($H=10.8538$, $p<0.05$) and technology ($H=19.1273$, $p<0.01$) addiction levels increased as their general academic GPA decreased, no significant difference was found in their attitude scores toward AI ($H=7.1302$, $p=0.0679$). In addition, in the analysis based on AI usage status, no significant difference was found in terms of internet addiction ($U=25800.5$, $p=0.3622$) or technology addiction ($U=25552.5$, $p=0.4512$). However, participants who used AI

Table 2. Mean scores of students' internet addiction, technology addiction, and attitudes toward AI (n=608)

Scale	Mean±SD	Min	Max
IAS			
Loss of control	18.63±5.42	7	35
Desire to stay online longer	8.17±2.81	3	15
Negativity in social relationships	17.17±6.82	8	43
Total	43.98±13.07	19	93
TAS			
Social network addiction	13.29±4.58	6	29
Instant messaging addiction	13.40±4.86	29	29
Online game addiction	11.30±5.84	6	30
Website addiction	13.65±5.40	6	30
Total	51.66±17.23	24	109
GATAIS			
Negative attitude toward AI	24.72±5.76	8	40
Positive attitude toward AI	42.60±7.47	12	104
Total	67.32±9.54	35	100

SD: Standard deviation, Min: Minimum, Max: Maximum, IAS: Internet Addiction Scale, TAS: Technology Addiction Scale, GATAIS: General Attitude Toward Artificial Intelligence Scale.

($\chi^2=68.16\pm9.41$) had significantly higher AI attitude scores than those who did not use AI ($\chi^2=62.74\pm8.97$) [U=31609.0, p<0.01] (Table 4).

Discussion

The findings indicate that students reported active daily use of the internet and technology. Similarly, Guven Özdemir and Sönmez² found that nursing students make intensive use of online technologies. Although most nursing students in our study use AI technologies, it was concluded that only a small proportion had received training on this subject, which was generally obtained from online platforms or informal sources. This finding aligns with the results reported by Lukić et al.¹⁰ and Akca Sumengen et al.¹¹ These results suggest that AI has not yet been sufficiently integrated into the nursing curriculum and that students' attitudes toward AI may be shaped more by limited knowledge and personal observation than by structured educational experiences. The finding that students primarily use AI for homework [56.5%] and general information [22.6%] indicates that this technology is not yet incorporated into health education in a structured and guided manner.¹ Unguided and unsupervised use of technology may lead students to accept AI-gen-

erated information without critically evaluating its accuracy, thereby increasing the risk of misinformation. This situation places important responsibility on educators to enhance digital literacy in nursing education and to develop structured teaching strategies that appropriately guide the use of AI.

In the present study, the level of internet addiction among nursing students was found to be moderate. When the subdimensions were examined, the higher scores for loss of control and negativity in social relationships, compared to the desire to stay online longer, may indicate that digital technologies exert more dominant effects on social functioning. Similarly, the mean total score for technology addiction was at a moderate level. The social network use and instant messaging subdimensions revealed that students primarily used technology for social interaction. These findings are consistent with the study by Göktaş and Öztürk's,³⁰ which demonstrated that increased technology use is largely concentrated on social media and instant communication platforms. Such patterns may negatively affect individuals' academic and social balance. Attitudes toward artificial intelligence were generally positive, with the overall attitude score predominantly reflecting the positive attitude toward AI subdimension. Dost et al.³¹ and Farghaly Abdelalim et al.¹ likewise reported that students demonstrated highly positive attitudes toward AI despite having limited direct experience. In addition, Gülirmak Güler and Şen Atasayar¹⁵ found that nursing students' attitudes toward AI were significantly associated with creative personality traits, suggesting that individual characteristics may shape positive perceptions of AI beyond experiential factors. Similarly, El-Kader and Hanson¹⁴ reported that most nursing students were moderate internet users, and 46.4% experienced occasional internet-related problems. Furthermore, 68.2% of students used the internet mainly for communication purposes, which confirms the prominence of digital media as a tool for social interaction.¹⁴ Although these findings are not directly related to AI, they suggest that students' frequent and socially oriented use of the internet may increase their familiarity with technology, thereby indirectly contributing to the development of positive attitudes toward AI, even in the absence of in-depth experience. Although this study does not include a specific scale or comparative analysis examining cultural differences, the literature indicates that attitudes toward artificial intelligence can be influenced by cultural values, educational systems, and access to technological infrastructure.³² In this context, the positive attitudes observed in the Turkish sample may be attributed to factors such as societal openness to digitalization, a high proportion of young people, and the level of technology integration in educational institutions. Furthermore, nursing students' positive attitudes toward AI are important for the adoption of AI-supported technologies in clinical practice. The literature emphasizes AI's potential to improve care quality and patient safety in nursing practice, particularly in areas such as clinical decision support systems, patient monitoring, early warning mechanisms, and data analytics.^{33,34} However, potential risks, including the limitations of algorithms in ethical decision-making processes, concerns regarding data privacy, and the possible weakening of human-centered care, have also been discussed.³⁵ Therefore,

Table 3. Correlation between internet addiction, technology addiction, and general attitude toward AI

Scale and Subdimensions	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12
	r	r	r	r	r	r	r	r	r	r	r	r
Loss of control (D1)		0.675**	0.623**	0.888**	0.662**	0.559**	0.260**	0.602**	0.633**	-0.149**	0.188**	0.038
Desire to stay online longer (D2)	0.675**		0.544**	0.776**	0.543**	0.471**	0.233**	0.538**	0.540**	-0.110**	0.151**	0.049
Negativity in social relationships (D3)	0.623**	0.544**		0.881**	0.735**	0.616**	0.490**	0.670**	0.757**	-0.229**	0.065	-0.112**
Internet Addiction Scale (D4)	0.888**	0.776**	0.881**		0.770**	0.657**	0.418**	0.713**	0.773**	-0.206**	0.142**	-0.036
Social network addiction (D5)	0.662**	0.543**	0.735**	0.770**		0.673**	0.457**	0.703**	0.852**	-0.158**	0.078	-0.061
Instant messaging addiction (D6)	0.559**	0.471**	0.616**	0.657**	0.673**		0.428**	0.659**	0.831**	-0.163**	0.059	-0.067
Online game addiction (D7)	0.260**	0.233**	0.490**	0.418**	0.457**	0.428**		0.445**	0.697**	-0.139**	0.082*	-0.050
Website addiction (D8)	0.602**	0.538**	0.670**	0.713**	0.703**	0.659**	0.445**		0.862**	-0.171**	0.046	-0.089*
Technology Addiction Scale (D9)	0.633**	0.540**	0.757**	0.773**	0.852**	0.831**	0.697**	0.862**		-0.191**	0.079	-0.080*
Negative attitude toward AI (D10)	-0.149**	-0.110**	-0.229**	-0.206**	-0.158**	-0.163**	-0.139**	-0.171**	-0.191**		0.023	0.597**
Positive attitude toward AI (D11)	0.188**	0.151**	0.065	0.142**	0.078	0.059	0.082*	0.046	0.079	0.023		0.768**
General Attitude Toward AI Scale (D12)	0.038	0.049	-0.112**	-0.036	-0.061	-0.067	-0.050	-0.089*	-0.080*	0.597**	0.768**	

r: Spearman's correlation coefficient, *: p<0.05, **: p<0.01.

Table 4. Relationship between demographic characteristics of nursing students and scale scores (n=608)

Demographic variable	n	Internet addiction scale Mean±SD	Technology addiction scale Mean±SD	General attitude toward AI scale Mean±SD
Gender				
Female	511	43.70±12.56	50.44±16.30	67.06±9.12
Male	97	45.46±15.47	58.09±20.38	68.67±11.45
U [p]		23436.0 (0.3956)	19441.0 (0.0008**)	23290.0 (0.3462)
Academic year				
1 st year	176	42.91±12.74	52.91±17.27	64.70±9.42
2 nd year	149	45.49±13.25	51.65±16.20	65.73±8.63
3 rd year	140	45.18±13.04	52.57±16.19	68.83±9.09
4 th year	143	42.55±13.17	49.25±19.06	70.72±9.82
H [p]		5.9533 (0.1139)	7.6486 (0.0539)	40.6232 (0.000*)
Overall GPA				
<2.50 (low)	115	46.26±13.53	57.23±18.99	65.36±10.40
2.50-3.00 (moderate)	228	44.98±13.48	52.60±17.73	67.50±9.91
3.01-3.50 (good)	193	42.63±12.57	48.90±15.42	67.93±8.72
>3.50 (very good)	72	40.81±11.45	47.19±14.71	68.20±8.78
H [p]		10.8538 (0.0125*)	19.1273 (0.0003**)	7.1302 (0.0679)
AI usage status				
Uses AI	513	44.17±13.07	51.84±17.21	68.16±9.41
Does not use AI	95	42.95±13.11	50.71±17.38	62.74±8.97
U [p]		25800.5 (0.3622)	25552.5 (0.4512)	31609.0 (0.000**)

*: p<0.05, **: p<0.01. SD: Standard deviation, U: Mann-Whitney U test, H: Kruskal-Wallis H test, GPA: Grade point average.

students' positive attitudes toward AI should be considered not only in terms of openness to technological innovation, but also in terms of their readiness to use these systems safely and ethically.

The strong correlations observed among the subdimensions of the internet and technology addiction scales indicates that these constructs can be evaluated both consistently and holistically, pointing to a multidimensional addiction profile. This finding is consistent with previous studies demonstrating that digital technologies are widely integrated into individuals' personal and academic lives.^{6,30} Furthermore, earlier research suggests that high levels of digital addiction among nursing students may negatively affect academic and psychological well-being.^{6,7} In particular, the significantly higher levels of technology addiction observed among male students support the influence of gender on digital habits.⁵ Additionally, the significant increase in internet and technology addiction levels as GPA decreases suggests that these digital habits may be inversely related to academic achievement.²

However, it is noteworthy that the relationships between attitudes toward AI and digital addiction indicators [internet and technology addiction] were weak. This may be explained by the fact that AI technologies have not yet been sufficiently integrated into students' daily and academic lives. Studies indicate that individuals' attitudes toward a technology are closely related to the frequency and context of their exposure to it.^{11,12,29} Students' knowledge and perceptions of AI appear to be largely based on indirect experiences; therefore, these attitudes may not be strongly associated with more established forms of digital behavior.^{1,36,37} Consistent with this, a recent study reported that nursing students' attitudes toward AI were influenced by individual characteristics, such as creative personality traits, suggesting that factors beyond digital behaviors may shape perceptions of AI.¹⁵ Based on these findings, AI-oriented applications, case studies, and clinical scenarios should be more systematically integrated into nursing education to foster stronger and more functional attitudes toward AI.

In this study, no significant differences were observed according to gender or AI use variables; however, grade level emerged as a significant determinant. The more positive attitudes toward AI observed among final-year students compared to first-year students suggest that the educational process enhances awareness and acceptance of this technology. This finding aligns with previous research indicating that

positive attitudes toward AI develop through exposure to and meaningful experience with the technology.^{11,36} Indeed, the significantly higher AI attitude scores among students who reported using AI indicate that usage influences attitude formation. Similarly, the literature shows that students who actively interact with AI tend to approach this technology more positively and demonstrate greater willingness to adopt it.³⁷ These findings suggest that expanding applied AI-related content within nursing education programs may play a critical role in fostering positive attitudes. Considering that the sample of this study consisted of nursing students, who will directly participate in patient care processes in their future professional practice, this finding is particularly significant. Therefore, although students' attitudes toward AI are positive, their largely superficial nature highlights the need to reinforce them through practice-based and experience-oriented education during training.

Overall, the findings indicate that nursing students are highly exposed to digital technologies; however, their direct experience with AI is limited. This suggests that while positive attitudes have formed, they are still superficial and are not grounded in practical use. Therefore, the integration of AI into the nursing curriculum should go beyond the awareness level and be supported by systematic, practice-based learning experiences.

Limitations

The generalizability of this study is limited, as the data were collected from nursing students within a specific timeframe. In addition, since AI use and attitudes were assessed through self-reported measures, response bias based on participants' subjective perceptions may have influenced the results. Furthermore, AI usage experience and frequency of use (factors that could affect attitudes toward AI) were not directly measured in this study. This should be considered an additional limitation when interpreting the findings.

Conclusion

The findings indicate that students' levels of internet and technology addiction are generally moderate. In addition, students' attitudes toward AI were found to be generally positive. However, these positive attitudes are primarily based on limited information, observation, and indirect learning sources rather than direct experience, despite participants' reports regarding their AI use and purposes.

This indicates that positive attitudes toward artificial intelligence have not yet translated into application-based competence.

Based on these findings, several strategic recommendations can be made regarding the integration of AI into nursing education within digital health systems. In particular, given the presence of positive yet experience-limited attitudes toward AI, it is necessary to incorporate AI into both theoretical coursework and practical training in a more systematic and structured manner to ensure that students' attitudes become sustained and functional. Accordingly, educational strategies should focus on enhancing students' technological competencies and supporting the effective and responsible use of AI.

In conclusion, although nursing students demonstrate high exposure to digital technologies, their direct experience with AI is limited. Nevertheless, they exhibit promising positive attitudes toward AI. Even when not fully experience-based, such positive attitudes are valuable in the context of rapidly digitalizing healthcare systems. The findings of this study contribute to the academic literature and hold strategic importance for shaping health policies, restructuring educational curricula, and developing professional competencies. Future research is recommended to comparatively examine nursing students' attitudes toward AI across different health disciplines and to provide more in-depth analyses using qualitative methodologies.

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