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Nursing Students' Learning Styles and Attitudes Towards Learning: A Cross-Sectional Study

Hemşirelik Öğrencilerinin Öğrenme Stilleri ve Öğrenmeye Yönelik Tutumları: Kesitsel Bir Çalışma

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Özet

Öğrenme her birey için farklı bir süreçtir. Her öğrencinin, öğrenme döngüsünün evrelerini farklı şekilde kullanması, öğrenmedeki bireysel farklılıkları açıklamaktadır. Bu çalışma, hemşirelik öğrencilerinin öğrenme stilleri ve öğrenmeye yönelik tutumlarını belirlemek amacıyla yürütülmüştür. Hemşirelik eğitiminin temel amacı, bilişsel, sosyal, duyuşsal ve psikomotor becerilere sahip, bireylere bütüncül bakım verebilen ve yaşam boyu öğrenme becerilerine sahip yetkin hemşireler yetiştirmektir. Bu amaçlara ulaşabilmek için sadece klasik eğitim yöntemleri yerine öğrencilerin öğrenme biçimlerine odaklanan bir eğitim sürecinin kurgulanması önemlidir. Öğrencilerin öğrenme stilleri hakkında bilgi sahibi olunması, öğrenme becerilerine ve öğrenmeye yönelik tutumlara olumlu katkı sağlar. Hemşirelik öğrencilerinin öğrenme stillerini ve öğrenmeye yönelik tutumlarını incelemek için kesitsel bir araştırma tasarımı kullanılmıştır. Bir devlet üniversitesinde toplam 444 lisans hemşirelik öğrencisi bu çalışmaya katılmıştır. Veriler, 2021-2022 eğitim-öğretim yılında Sosyo-Demografik Özellikler Formu, Öğrenme Stilleri Envanteri ve Öğrenmeye Yönelik Tutum Ölçeği kullanılarak çevrimiçi bir anketle toplanmış ve veriler, tanımlayıcı istatistikler ve Mann-Whitney U testi kullanılarak analiz edilmiştir. Çalışmada hemşirelik öğrencileri %59,2'sinin yaparak, %83,4'ünün hissederek, %85,6'sının görsel ve %63,7'sinin sıralı öğrenme stiline sahipti. Öğrenmeye İlişkin Tutum Ölçeği toplam puan ortalamalarının 153,26±11,16 olduğu belirlenmiştir. Hemşirelik öğrencilerinin öğrenmeye yönelik tutumları ve beklentileri olumludur. Düşünerek ve işitsel öğrenme stillerine sahip öğrencilerin öğrenmeye yönelik tutumları daha olumludur. Hemşirelik eğitiminde öğrencilerin öğrenme stillerinin belirlenmesi ve öğrencilere uygun öğrenme yöntemlerinin kullanılması önerilmektedir. Hemşirelik öğrencilerinin öğrenmelerini kolaylaştırmada sözel öğrenme kaynaklarının daha etkin kullanılmasının öğrencilerin öğrenme süreçlerini olumlu yönde etkileyeceği düşünülmektedir.

Anahtar Kelimeler: Hemşirelik Öğrencileri, Hemşirelik Eğitimi, Öğrenme, Tutum

Abstract

Learning is a unique process for each individual. The different ways in which each student uses the stages of the learning cycle explain the individual differences in learning. This study was conducted to determine the learning styles and attitudes of nursing students towards learning. The main aim of nursing education is to train competent nurses who have cognitive, social, emotional, and psychomotor skills and are able to provide holistic care and have lifelong learning skills. To achieve these goals, it is important to design an education process that focuses on the learning styles of students rather than just traditional teaching methods. Having knowledge about students' learning styles contributes positively to learning skills and attitudes towards learning. A cross-sectional research design was used to examine nursing students' learning styles and attitudes towards learning. A total of 444 undergraduate nursing students at a public university participated in this study. Data were collected using the Socio-Demographic Characteristics Form, Learning Styles Inventory, and The Scale of Attitudes Towards Learning with an online questionnaire during the 2021-2022 academic year. The data were analyzed using descriptive statistics and the Mann-Whitney U test. Of the nursing students, 59.2% had a learning style by doing, 83.4% by feeling, 85.6% by visual, and 63.7% by sequential. The mean score of the Attitudes towards Learning Scale was determined to be 153.26±11.16. Nursing students' attitudes and expectations towards learning were positive. Students who have thinking and verbal learning styles have more positive attitudes toward learning. It is recommended to determine students' learning styles and use appropriate learning methods for students in nursing education. It is thought that the effective use of verbal learning resources for facilitating the learning of nursing students will positively affect the students' learning processes.

Keywords: Nursing Students, Nursing Education, Learning, Attitude

Since learning is a unique and individual process like fingerprinting, each individual learns differently, and each individual's perception and learning levels differ. As well as individual factors, social and psychological factors affect learning. Therefore, taking a similar education doesn't lead to the same level of learning for every student. The two important factors that need to be addressed to enhance students' learning levels are the dominant learning style among students and students' attitude towards learning (Dikmen et al., 2018; Guillasper et al., 2020).

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Yükseköğretim Dergisi / TÜBA Higher Education Research/Review (TÜBA-HER), 13(2), 227-236. © 2023 TÜBA
Geliş tarihi / Received: Şubat / *February* 18, 2023; **Kabul tarihi / Accepted:** Temmuz / *July* 5, 2023
Bu makalenin atıf künyesi / How to cite this article: Evrenol Öcal, S., Çetin Avcı, S., Işık, G., Yeşilçınar, İ., Can, S. Z. & Egelioğlu Cetişli, N. (2023). Nursing students' learning styles and attitudes towards learning: A cross-sectional study. *Yükseköğretim Dergisi, 13*(2), 227-236. doi: 10.53478/yuksekogretim.1252746

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Learning is a different process for each person. Individual differences can be explained as each student uses different learning stages in the learning process. The learning process plays a crucial role in individuals' development of knowledge and skills. However, it is a fact that each individual learns in a unique way and exhibits a different attitude towards learning. Two significant factors that have a substantial impact on the effectiveness and efficiency of the learning process are learning style and attitude towards learning. Learning style refers to how an individual processes, understands, and remembers information. The fact that each person has a different preferred learning style reflects their individual learning needs. While some individuals may learn better visually, others may prefer auditory or kinesthetic methods. Learning style is a fundamental factor that determines how an individual approaches the learning process and processes information (Dikmen et al., 2018; Feldman et al., 2014).

On the other hand, attitude towards learning refers to the emotional and cognitive responses individuals have towards the learning process. A positive attitude towards learning enhances motivation, encourages active engagement in the learning process, and increases the likelihood of achieving success. In contrast, a negative attitude towards learning can be associated with lack of motivation, disinterest, and disengagement from the learning process (Dickinson et al., 2021). Additionally, it affects the individual's attitude toward learning as well as the receiving and processing of information and lifelong learning skills (Ahmed et al., 2019; Fredette et al., 2015; Göloğlu-Demir, 2021). Individuals who have not discovered their learning style or have not been educated according to their learning style may think learning is a complicated process. As a result, they may feel unsuccessful and exhibit negative attitudes towards learning. While positive attitudes towards learning increase success, negative attitudes can cause failure. Positive attitudes toward a subject or a lesson increase the students' and enable effective learning by positively affecting academic achievement (Kara, 2010; Otrar & Kuyucak, 2019).

The main objectives of nursing education are to graduate competent nurses who have cognitive, social, affective, and psychomotor skills. In order to achieve these objectives, it is crucial building an education process focused on the learning style of the students rather than providing only classical education methods (Dickinson et al., 2021; Gün & Denat, 2020). Therefore, educators have essential responsibilities to facilitate the learning process. Additionally, educators should know well about the audience, identify the dominant learning styles among students and offer learning experiences accordingly (Doğan et al., 2018). Besides, students should be aware of their learning styles and take an active role in the learning process. Students need to know how they perceive their learning process, learning styles, and strengths and weaknesses. Students' knowledge about their learning styles contributes positively to their lifelong learning skills and attitudes towards learning (Ültanır et al., 2012).

Providing a learning experience that appeals to students' learning styles and in which they can take an active role contributes to their development of positive attitudes towards learning. The relationship between attitude towards learning and learning style is an important focal point for educators and students. Instructional methods tailored to students' preferred learning styles can make the learning process more effective and enhance students' motivation. Effective teaching strategies that positively influence attitude towards learning can help students become more enthusiastic and committed to the learning process. No study has been encountered in the literature examining nursing students' learning styles and attitudes toward learning. Therefore, this study aimed to determine nursing students' learning styles and attitudes towards learning. It is thought that the findings obtained as a result of the study will make significant contributions to the structuring and improvement of learning and teaching processes in nursing education.

Method

Research Model

This study followed a cross-sectional research design.

Study Group

The study subjects were nursing students and the research population consisted of students (N=756) studying in the undergraduate nursing program of a state university in Izmir in the 2021-2022 academic year. In the study, no sample selection was made, it was aimed to reach the whole universe. Inclusion criteria included undergraduate nursing program students of the Faculty of Health Sciences who (i) were aged >18, (ii) were without a history of psychiatric disorder, (iii) had a mobile phone with internet and (iv) were willing to participate in the survey. Fifty-nine students did not register for the course or continue to the course after registration, and 253 students did not accept to participate in the research. Four hundred forty-four students (n: 444 and participation rate 58.7%) agreed and participated in the study.

Data Collection Tools

The study data were collected via Google Forms using the Socio-demographic Characteristics Form, the Learning Style Inventory and The Scale of Attitudes Towards Learning (Fer, 2003; Kara, 2010).

Socio-demographic Characteristics Form: The form prepared by the researchers in line with the relevant literature (Kara, 2010; Dikmen, 2015; Dikmen et al., 2018). The form consisted of 10 questions to determine the age of the students, gender, the educational status of their parents, the region they live in, class, and the reasons for choosing the nursing profession.

Learning Styles Inventory (LSI): The inventory was developed by Felder and Silverman (1996) to determine learning styles. It was adapted to Turkish by Fer (2003), and its validity and reliability studies were conducted. The scale consists of 44 items, consisting of options a and b. The scale has four-dimension and each dimension have two sub-dimensions. The dimensions of the model are: (1) sensing/intuitive, (2) visual/verbal, (3) active/reflective, and (4) sequential/global. Each dimension is measured with 11 items (Fer, 2003). While option "a" represents active, sensing, visual and sequential dimensions, option "b" reflects reflective, intuitive, verbal, and global dimensions in the scale.

As a result, after looking at the sum of a or b, it is revealed which one is dominant. For example, a participant who marks the "a" option in all 11 questions that measure the Sensing/Intuitive score will get -11 points in this dimension, and the participant who marks the "b" option in all of them will get +11 points. For example, if the participant's score is negative, it shows that they are sensing that dimension, and their positive score is intuitive (Aksoy & Pakkan, 2011). In the study conducted by Fer (2003), the Cronbach alpha coefficient of the inventory was found as 0.58. According to Van Zwanenberg et al., (2000), the low Cronbach Alpha value of the scale is due to the presence of items with opposite polarity in the scale. In this study, the Cronbach alpha coefficient was found to be 0.70.

The Scale of Attitudes Towards Learning (SATL): The scale was developed by Kara (2010) to determine individuals' attitudes towards learning. The five-point Likert type scale is composed of 40 items and four sub-dimensions consisting of "nature of learning (7 items)", "openness (11 items)", anxiety (13 items)", and "expectation (9 items)". There are 29 positive and 11 negative items on the scale. As the total score obtained from the scale (min-max: 40-200) increases, the positive attitude towards learning increases. The test-retest reliability of the scale was 0.87. The Cronbach Alpha internal consistency coefficient of each sub-dimension varied between 0.72 and 0.81. In this study, the Cronbach's Alpha coefficients of the sub-dimension were found to be 0.619 (nature of learning), 0.838 (openness), 0.851 (anxiety), and 0.812 (expectations), respectively. The Cronbach alpha coefficient was found as 0.73 Kara's study (2010). In this study, the Cronbach alpha coefficient was found as 0.71.

Data collection

Research data were collected between September 2021 and May 2022. Participants completed the survey via Google Forms, a secure online survey platform. The online survey link of the research was delivered to the nursing students through the researchers and the nursing class representatives enrolled in the university. All participants consented to participate in the research via online forms. Before they were administered the online questionnaire in the system, the participants were informed through an explanation text about the study. Students only who agreed to participate in the study were able to see the questions.

Data Analysis

Data were downloaded from the Google Forms database and imported to SPSS Version 22.0 statistical package program for analysis. The students' socio-demographic characteristics in the study were given as number and percentage distributions. The conformity of the data to the normal distribution was evaluated with the Shapiro-Wilk test, and the Mann-Whitney U test was used to compare the scores of two different participant groups. In all statistical analyses, $p<0.05$ was accepted as a significance level.

Table 1. Descriptive Characteristics of Students (n=444).

Descriptive Features		
	Mean±SD (Min, Max)	
Mean Age (years)	20.59±1.73 (Min:17, Max:31)	
Gender	**Number (n)**	**Percent (%)**
Female	346	77.9
Male	98	22.1
Grade Level		
First grade	108	24.3
2nd grade	109	24.5
3rd grade	120	27.1
4th grade	107	24.1
High School Graduated		
Health Professions High School	22	5.0
Anatolian High School	385	86.7
Science High School	37	8.3
Mother's Educational Status		
Illiterate	46	10.4
Primary School	278	62.6
Secondary School	94	21.1
High education	26	5.9
Father's Educational Status		
Illiterate	8	1.8
Primary School	256	57.7
Secondary School	122	27.4
High education	58	13.1
Willingly Choosing the Department of Nursing		
Yes	283	63.7
No	161	36.3
The Status of Satisfaction with Nursing Education		
Yes	323	72.7
No	121	27.3
Total	444	100

Ethical Declaration

The study was approved by the Non-Interventional Clinical Research Ethics Committee of the University (numbered: 691, dated: 12.05.2020) and institutional permissions were issued by the Faculty of Health Science before the study data were obtained.

Findings

The mean age of the students was 20.59±1.73 years, of the students 77.9% were female, 27.1% were in third grade, and 86.7% of them were graduated of Anatolian high school. Of the students, 62.6% indicated that the mothers and 57.7% indicated that the fathers were primary school graduates. Of the students, 63.7% stated that they willingly chose the nursing profession, and 72.7% stated they were satisfied with their nursing education (Table 1).

The mean score of the students participating in the study on SATL was 153.26±11.16 (min-max=92-175), and the mean scores of the sub-dimensions of nature of learning, expectation about learning, openness to learning, and anxiety about learning were 30.29±3.35, 40.01±4.71, 45.25±6.66 and 37.70±8,64, respectively. In this study, it was determined that 59.2% of the nursing students had learning styles by doing, 83.4% by feeling, 85.6% by visual, and 63.7% by sequential (Table 2).

The attitudes of students towards learning according to their socio-demographic characteristics are presented in Table 3. The total attitude scale score average of female students is higher compared to male students (U=12591.000; p=0.000). When examined according to class level, the total score average of first-year students on the SATL scale is higher than other class levels (KW=14.412; p=0.002). In the post-hoc analysis (Tamhane's T2), it was determined that this difference is due to the score difference between second and first-year students (-5.540) (p=0.001).

The total score average on the SATL scale is higher for students who voluntarily chose the nursing department and are satisfied with their nursing education, but the difference between them is not significant (U=21962.000, p=0.528; U=19335.000, p=0.864) (Table 3).

In the study, the mean age of students who learn by doing is statistically significantly higher than students who learn by thinking (U=21037.500, p=0.034), and 84% of females learn by thinking while only 26.2% of males learn by doing (χ2=6.502, p=0.011). When examining the visual-auditory subscale, 87.5% of females have an auditory learning style,

Table 2. Mean Scores and Distributions of Students' Attitudes towards Learning Scale and Learning Style Index Sub-Dimensions.

Scale	Min-Max	Mean±SD
The Scale of Attitudes Towards Learning Total Score Average	92-175	153.26±11.16
Nature of Learning	17-35	30.29±3.35
Expectation	13-45	40.01±4.71
Openness	17-55	45.25±6.66
Anxiety	13-63	37.70±8.64
Learning Style Index (LSI)	**n**	**%**
Active/Reflective		
Active	263	59.2
Reflective	181	40.8
Sensing/Intuitive		
Sensing	370	83.4
İntuitive	74	16.6
Visual/Verbal		
Visual	380	85.6
Verbal	64	14.4
Sequential/Integrative		
Sequential	283	63.7
İntegrative	161	36.3

Table 3. Attitudes towards Learning According to Students' Socio-Demographic Characteristics.

Socio-Demographic Characteristics	THE SCALE OF ATTITUDES TOWARDS LEARNING				
	Nature of Learning Mean Score	Expectancy Mean Score	Opennes Mean Score	Anxiety Mean Score	The Scale of Attitudes Towards Learning Total Mean Score
	r/p	r/p	r/p	r/p	r/p
Mean Age (n=444)	r=0,059 p=0,216	r=0,053 p=0,263	r=-0,037 p=0,434	r=-0,059 p=0,216	r=-0,047 p=0,322
Gender	**Mean±SD**	**Mean±SD**	**Mean±SD**	**Mean±SD**	**Mean±SD**
Female	30,63±2,96	40,43±4,33	45,51±6,41	38,04±8,83	154,63±9,82
Male	29,08±4,25	38,52±5,63	44,31±7,43	36,51±7,86	148,42±13,99
U/p	**U=13598,000 p=0,003**	**U=13302,500 p=0,001**	U=15643,500 p=0,242	U=14930,500 p=0,071	**U=12591,000 p=0,000**
Grade Level					
First grade	30,04±3,34	40,22±4,11	46,25±6,25b	39,43±8,64	155,95±9,10a
2nd grade	30,30±3,42	39,32±4,58a	43,81±7,07bc	36,95±8,48	150,41±11,51a
3rd grade	30,35±3,36	39,79±5,04	44,68±6,94	38,04±8,62	152,87±12,47
4th grade	30,29±3,35	40,75±4,97a	46,34±6,03c	36,34±8,63	153,87±10,57
KW/p	KW=1,831 p=0,608	**KW=8,748 p=0,033 P^a:0,019**	**KW=11,008 p=0,012 P^b:0,049 P^c:0,028**	KW=7,223 p=0,065	**KW=14,412 p=0,002 P^a:0,001**
Willingly Choosing the Department of Nursing					
Yes	30,16±3,33	40,57±4,01	46,10±6,12	36,47±8,49	153,32±10,26
No	30,50±3,37	39,03±5,61	43,74±7,30	39,86±8,51	153,14±12,63
U/p	U=21273,000 p=0,243	**U=19201,500 p=0,006**	**U=18433,500 p=0,001**	**U=17909,500 p=0,000**	U=21962,000 p=0,528
The Status of Satisfaction with Nursing Education					
Yes	30,21±3,17	40,48±4,14	46,01±6,17	36,94±8,50	153,65±10,05
No	30,48±3,78	38,76±5,80	43,22±7,48	39,74±8,72	152,21±13,70
U/p	U=17904,500 p=0,171	**U=16136,500 p=0,004**	**U=15153,500 p=0,000**	**U=16073,000 p=0,004**	U=19335,000 p=0,864

U: Mann-Whitney U test
a,b,c: Indicates the source of the difference between class levels.
KW: Kruskal-Wallis analysis

while 23.7% of males have a visual learning style, and the difference between them is significant ($\chi 2=3.983$, p=0.046). There is no significant difference in learning styles among students based on class level, voluntary selection of the nursing department, and satisfaction with nursing education (Table 4).

Learning styles according to students' attitudes towards learning were given in Table 5. The total and learning anxiety sub-dimension mean scores of students with a learning style by thinking (154,71±10,43; 38.91±9.00) were higher than the total mean scores of students with a learning style by doing (152.25±11.55; 36.87±8.30), and the difference between them was significant (p=0.010; p=0.042). The total mean score of the attitude scale towards learning, expectation about learning, and openness to learning sub-dimension (40.95±5.3; 46.54±6.73) of students with verbal learning style were higher than the mean scores of students with visual learning style (39.85±4.59; 45.03±6.64) and the difference between them was significant (p=0.001; p=0.038) (Table 5).

Discussion

Learning is the process in which the learner takes an active role. Thus, the student recognizes and learns their strengths and weaknesses. Each individual learns how they realize and perceive the learning process in an individual learning style. Individuals need to know their learning styles, strengths, and weaknesses regarding learning to improve their attitude

Table 4. Learning Styles of Students According to Socio-Demographic Characteristics.

Socio-Demographic Characteristics	SUBDIMENSIONS OF THE LEARNING STYLE SCALE															
	Active/Reflective				Sensing/İntuitive				Visual/Verbal				Sequential/İntegrative			
	Active		Reflective		Sensing		İntuitive		Visual		Verbal		Sequential		İntegrative	
	Mean±SD		Mean±SD		Mean±SD		Mean±SD		Mean±SD		Mean±SD		Mean±SD		Mean±SD	
Mean Age	20,75±1,77		20,36±1,64		20,58±1,69		20,66±1,90		20,61±1,72		20,52±1,76		20,63±1,61		20,53±1,92	
U/p	U=21037,500 p=0,034				U=13659,500 p=0,975				U=11692,500 p=0,616				U=21161,000 p=0,204			
Gender	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Female	194	73,8	152	84,0	294	79,5	52	70,3	290	76,3	56	87,5	215	76,0	131	81,4
Male	69	26,2	29	16,0	76	20,5	22	29,7	90	23,7	8	12,5	68	24,0	30	18,6
x2/p	**x2=6,502**		**p=0,011**		x2=3,027		p=0,082		**x2=3,983**		**p=0,046**		x2=1,736		p=0,188	
Grade Level																
First grade	54	20,5	54	29,8	92	24,9	16	21,6	94	24,7	14	21,9	62	21,9	46	28,6
2nd grade	66	25,1	43	23,8	83	22,4	26	35,1	94	24,7	15	23,4	71	25,1	38	23,6
3rd grade	75	28,5	45	24,9	102	27,6	18	24,3	97	25,5	23	35,9	79	27,9	41	25,5
4th grade	68	25,9	39	21,5	93	25,1	14	18,9	95	25,0	12	18,8	71	25,1	36	22,4
x2/p	x2=5,248		p=0,155		x2=5,549		p=0,136		x2=3,307		p=0,347		x2=2,510		p=0,473	
Willingly Choosing the Department of Nursing																
Yes	174	66,2	109	60,2	242	65,4	41	55,4	244	64,2	39	60,9	179	63,3	104	64,6
No	89	33,8	72	39,8	128	34,6	33	44,6	136	35,8	25	39,1	104	36,7	57	35,4
x2/p	x2=1,636		p=0,201		x2=2,668		p=0,102		x2=0,254		p=0,614		x2=0,080		p=0,777	
The Status of Satisfaction with Nursing Education																
Yes	195	74,1	128	70,7	270	73,0	53	71,6	270	71,1	53	82,8	203	71,7	120	74,5
No	68	25,9	53	29,3	100	27,0	21	28,4	110	28,9	11	17,2	80	28,3	41	25,5
x2/p	x2=0,635		p=0,426		x2=0,057		p=0,812		x2=3,821		p=0,051		x2=0,407		p=0,524	

and lifelong learning ability. Learning is the most crucial factor for all fields of education. Identifying the dominant learning preferences in nursing students will help educators learn more about their students, improve their teaching styles, and adapt them to different learning styles (Alharbi et al., 2017; Gonzales et al., 2017; Pai et al., 2013; Zhang & Lambert, 2008). It was determined that doing, feeling, visual, and sequential learning styles were dominant in this study.Similarly, studies found that doing, feeling, visual, and sequential learning styles were found dominant among nursing students (Alharbi et al., 2017; Gonzales et al., 2017). In two different studies conducted with nursing students in China and Taiwan, the dominant learning styles were determined as thinking, feeling, visual, and global learning style (Pai et al., 2013; Zhang & Lambert, 2008). It was determined that nursing students learn better by using psychomotor and affective learning areas in the studies in literature and this study found parallel results. This result reveals the importance of laboratory and clinical practice in nursing education.

It was found that the students participating in this study had positive attitudes towards learning. There are limited studies in the literature evaluating students' attitudes towards learning. Similar results were obtained in this study conducted with nursing students of a university located in the western part of Türkiye (Denat, 2019). Recent studies have often examined students' attitudes towards online learning and their attitudes towards learning communication skills. According to these studies, it has been found that students' attitudes toward online learning were at a moderate level (Şener et al., 2022; Günay İsmailoğlu et al., 2021; Yiğit, 2021). Students' attitudes towards learning communication skills were found to be positive in studies evaluating the communication skills of nurses and nursing students (Škodová et al., 2018; Iwanow et al., 2021). In line with these results, it can be said that students' attitudes towards learning in formal education are more positive.

It was found that students' expectations about learning and the nature of learning were positive, and they were open to learning. The results of Denat's study also support these findings, and students' learning anxiety levels were similar to our findings (Denat, 2019). According to these results, it can be said that students' attitudes towards learning were positive, and they also experienced moderate anxiety. It was recommended to plan new studies to evaluate the causes of stress experienced by students.

Table 5. Learning Styles According to Students' Attitudes Towards Learning

ATTITUDES TO LEARNING SCALE	LEARNING STYLE SCALE SUB-DIMENSIONS							
	ACTIVE/REFLECTIVE		SENSING/INTUITIVE		VISUAL/AUDITORY		SEQUENTIAL/INTEGRATIVE	
	Active Mean±SD	Reflective Mean±SD	Sensing Mean±SD	İntuitive Mean±SD	Visual Mean±SD	Verbal Mean±SD	Sequential Mean±SD	İntegrative Mean±SD
The Scale of Attitudes Towards Learning Total Score Average	152.25±11.55	154.71±10.43	153.65±10.62	151.29±13.49	153.16±10.97	153.84±12.32	153.15±10.72	153.44±11.93
Statistical Analysis	**U=20395.500**	**p=0.010**	U=12492.500	p=0.234	U=11549.000	p=0.520	U=22013.500	p=0.554
Attitudes Towards Learning Scale Sub-Dimensions								
Nature of Learning	30.22±3.43	30.38±3.22	30.45±3.23	29.97±3.88	30.31±3.38	30.12±3.14	30.39±3.31	30.09±3.42
Statistical Analysis	U=23121.000	p=0.606	U=13083.000	p=0.545	U=11598.000	p=0.552	U=21374.500	p=0.276
Expectation	39.97±4.92	40.06±4.40	40.14±4.54	39.33±5.47	39.85±4.59	40.95±5.31	40.05±4.51	39.93±5.06
Statistical Analysis	U=23556.000	p=0.853	U=12991.500	p=0.486	**U=9090.000**	**p=0.001**	U=22706.500	p=0.954
Openness	45.18±6.18	45.35±6.89	45.28±6.43	45.08±7.79	45.03±6.64	46.54±6.73	45.19±6.61	45.34±6.77
Statistical Analysis	U=23348.500	p=0.733	U=13302.500	p=0.700	**U=10195.500**	**p=0.038**	U=22254.500	p=0.685
Anxiety	36.87±8.30	38.91±9.00	37.86±8.66	36.90±8.54	37.95±8.38	36.21±10.02	37.50±8.96	38.05±8.08
Statistical Analysis	**U=21106.500**	**p=0.042**	U=12875.500	p=0.419	U=10840.000	p=0.164	U=22508.000	p=0.833

U: Mann Whitney U test

In our study, it was found that female students have higher attitudes towards the nature of learning and higher expectations for learning compared to male students. Similar findings were reported in the study conducted by Dikmen et al. (2018), which also found a significant difference in favor of females in the expectation subdimension. Likewise, Denat's study (2019) found that female students had higher scores in the expectation and clarity subdimensions. Adıgüzel's study (2014) also found that female undergraduate students had higher attitudes towards learning compared to males. Taking into account the results of a study by Van Houtte (2004), which indicated that female students engage in fewer misbehaviors related to school and classes, have lower absenteeism rates, and are more eager for new topics, our study results are consistent with other findings. The higher attitudes of female students towards learning can be explained, as mentioned in the literature, by their higher efforts towards learning compared to male students (Güloğlu-Demir, 2021). In our study, it was found that first-year students have higher attitudes towards learning compared to students in other class levels. In a study by Yalçınkaya (2019) examining nursing students' attitudes towards mobile learning, a difference was found between class level and attitude, where fourth-year students had higher attitude scores compared to first and second-year students. However, there are also studies in the literature that indicate no difference between class level and attitudes towards learning (Sarıbaş & Meydan, 2020; Şener et al., 2022). It is believed that the higher attitudes of first-year students towards learning in our study may be attributed to their new initiation into university life and the prospect of learning new subjects.

In the study, it was found that students who learn by doing have a higher average age compared to students who learn by thinking. This result is believed to be due to the nature of the study being conducted with nursing students, who are involved in an applied profession. In addition to studies in the literature that indicate differences in learning styles based on age (Dikmen et al., 2018; Ergür, 2010; Can, 2011), there are also studies that indicate no differences (Atabay & Kurman, 2013; Özgür, 2013; Özgür, 2013a). It was determined that female students have a higher level of learning styles in terms of doing/thinking and visual/auditory styles compared to male students. Similarly, in a study conducted by Karamustafaoğlu et al. (2017) with science education students, it was found that female teacher candidates showed significant differences in terms of the feeling and visual learning styles compared to male teacher candidates. However, no significant differences were observed in terms of doing/thinking and sequential/holistic sub-dimension scores based on gender. The presence of different research findings may be attributed to the use of different learning style scales in the studies.

Students who have a thinking learning style had a more positive attitude toward learning, and their anxiety levels about learning were higher than those with a learning style by doing in this study. Since students who have a thinking learning style can be more successful in learning theoretical knowledge, it was estimated that their attitudes towards learning were more positive. However, it was thought that the students' anxiety levels who have a doing learning style were lower because clinical practice constitutes the majority of nursing education. There is no other study in the literature examining the relationship between students' learning styles and attitudes.

The expectations towards learning and openness to learning of students with verbal learning styles were more positive than those with visual learning styles in this study. While students with a visual learning style perform the learning process with visual messages such as the instructor's body language and facial expressions, students with a verbal learning style learn by listening to verbal expressions and in-class discussions (Shah & Gathoo, 2017; Yassin & Almasri, 2015).

The most commonly used methods in nursing undergraduate education are question-answer, slide shows, in-class discussion methods, video, role-play, and simulation. It is known that the education method chosen in the learning process appeals to more than one sense, facilitating permanent learning (Filiz & Dikmen, 2017; Shah & Gathoo, 2017). The learning styles of the nursing students participating in the study also differ, and it can be said that they provide learning by using more than one learning style. For this reason, students' learning can be supported by using different methods in nursing education.

Conclusion

Our study found that the attitudes and expectations toward nursing students' learning were positive, and they were open to learning. Students experienced moderate anxiety toward learning. Future studies are needed to determine the factors that increase students' anxiety levels. According to this study, students with thinking and verbal learning styles have more positive attitudes towards learning.

In conclusion, understanding the relationship between learning style and attitude towards learning is crucial for the success of the learning process, and incorporating this knowledge into educational practices is highly important. It is critical for educators to identify students' learning styles and develop teaching methods that align with them, as this is a key step in optimizing the learning experience and enhancing success. By considering and adapting to individual learning styles, educators can create a more engaging and effective learning environment that supports students' learning needs and fosters their overall academic achievement.

According to this research, it is recommended to determine the prevalent learning style among students at the beginning of nursing education. Based on this, the teaching technique and method should be selected by the instructor accordingly. Based on the findings, it has been concluded that nursing students exhibit a predominant preference for by doing, feeling, visual and sequential learning styles. In line with these findings, it is recommended to increase the number of laboratory and clinical practice sessions in nursing education or enhance their efficiency and effectiveness. This approach would cater to the learning preferences of nursing students, allowing them to actively engage in practical experiences and reinforce their understanding of the subject matter.

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