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The Relationship Between Nursing Students' Medical Error Tendency and Personality Types and Assertiveness: A Cross-Sectional Study

Hemşirelik Öğrencilerinin Tıbbi Hata Eğilimleri ile Kişilik Tipleri ve Atılganlıkları Arasındaki İlişki: Kesitsel Bir Araştırma

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ABSTRACT Objective: The aim of this study is to assess the relationship between nursing students' medical error tendency levels, their personality types, and their assertiveness levels. **Material and Methods:** The study is a descriptive and cross-sectional study. It was conducted between March-June 2023 at the faculty of nursing of a state university. A total of 193 undergraduate students participated in the study. Data were collected using the Personal Information Form, Nursing Medical Error Proneness Scale, Type A Personality Scale and Rathus Assertiveness Inventory. The data were analyzed by calculating the frequency, percentage, mean and standard deviation and by using correlation analysis. **Results:** During clinical practice, 23.8% of the students were found to have sharp object injuries, 24.4% to have contact with patient blood/contaminated material. The average Type A Personality score of the students was 73.79±15.57 and the average Assertiveness score was 11.32±23.47. Students with high Assertiveness scores tended to make medical errors ($p<0.05$). A negative significance was determined between Assertiveness and the Type A Personality Scale timing sub-dimension ($p<0.05$). **Conclusion:** It was determined that the students had high type A personality scores and low assertiveness scores. It was observed that students with type A personality traits were more prone to medical errors due to higher stress levels and students who followed field-specific scientific publications were less likely to make medical errors.

Keywords: Assertiveness; personality types; nursing students; medical error

ÖZET Amaç: Bu çalışmanın amacı, hemşirelik öğrencilerinin tıbbi hata eğilim düzeyleri ile kişilik tipleri ve atılganlık seviyeleri arasındaki ilişkiyi incelemektir. **Gereç ve Yöntemler:** Çalışma, tanımlayıcı ve kesitsel bir çalışmadır. Mart-Haziran 2023 tarihleri arasında bir devlet üniversitesinin hemşirelik fakültesinde yürütülmüştür. Çalışmaya toplam 193 lisans öğrencisi katılmıştır. Veriler; Kişisel Bilgi Formu, Hemşirelik Tıbbi Hata Eğilimi Ölçeği, A Tipi Kişilik Ölçeği ve Rathus Atılganlık Envanteri kullanılarak toplanmıştır. Veriler frekans, yüzde, ortalama ve standart sapma hesaplanarak ve korelasyon analizi kullanılarak analiz edilmiştir. **Bulgular:** Klinik uygulama sırasında öğrencilerin %23,8'inin kesici alet yaralanması, %24,4'ünün hasta kanı/ kontamine materyalle temas ettiği bulunmuştur. Öğrencilerin ortalama A Tipi Kişilik puanı 73,79±15,57 ve ortalama atılganlık puanı 11,32±23,47 idi. Yüksek atılganlık puanına sahip öğrenciler tıbbi hata yapma eğilimindeydi ($p<0,05$). Atılganlık ile A Tipi Kişilik Ölçeği zamanlama alt boyutu arasında negatif anlamlılık belirlendi ($p<0,05$). **Sonuç:** Öğrencilerin yüksek A tipi kişilik özelliklerine ve düşük atılganlık puanlarına sahip oldukları belirlendi. A tipi kişilik özelliklerine sahip öğrencilerin daha yüksek stres seviyeleri nedeniyle tıbbi hatalara daha yatkın oldukları ve alana özgü bilimsel yayınları takip eden öğrencilerin tıbbi hata yapma olasılıklarının daha düşük olduğu görüldü.

Anahtar Kelimeler: Atılganlık; kişilik tipleri; hemşirelik öğrencileri; tıbbi hata

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Errors and adverse events committed by healthcare professionals can jeopardize patient safety and lead to injury, disability or death.[1] Medication administration, an important procedure in nursing practice, takes up 40% of nurses' time.[2] Despite the inclusion of medication education in most nursing curriculum, existing methodologies do not sufficiently prepare nurses to achieve the requisite levels of clinical competence.[3] Nursing students get knowledge about medication delivery protocols through theoretical instruction in classrooms and laboratories. Studies show that approximately half of nursing students make medical errors (28.3%-58.8%). The predominant category of medical error is drug error.[1,4-8] Students' inadequate clinical experience may predispose them to errors in medication administration. Research indicates that students who commit medical errors experience a spectrum of feelings, including dread, disgust, guilt, and anxiety.[1-4] Evidence indicates that medication errors influence students' judgments of their professional competence, some studies have also reported loss of self-confidence and students' fear of making errors as factors that increase the risk of errors.[9,10] Students with low medication administration confidence experience distress due to anxiety and fear of making mistakes, which can lead to medication errors.[3]

Students' personality types are an important factor affecting their confidence in administering medication and therefore their attitudes towards errors. Individuals with Type A personalities are more productive, hardworking and ambitious, while individuals with Type B personalities are calmer, more relaxed and more balanced.[11] Personality traits play a major role in the nursing profession, as this profession requires many psychosocial skills such as effective communication, empathy, coping with stress and decision-making in complex situations. Different personality traits can determine how nurses perform their jobs, how they embrace their roles within the profession and how they cope with stressful situations.[12] A study involving nursing and midwifery students revealed that 59.7% had Type A personality traits.[13] Since the nursing profession requires skills such as effective communication, decision-making and problem-solving, the degree of assertiveness is important in the utilization of these skills. According to the research results, it was determined that nursing students are generally shy.[14-16] The literature emphasizes that shyness is a common characteristic among healthcare professionals and that this can have negative effects on communication skills and patient relationships. Shyness can make it difficult for students to express themselves in clinical settings, which can increase the risk of making medical errors.[14-16] Understanding the extent of medical errors that occur in all healthcare areas is critical to preventing such events from recurring in the future. However, there is limited research on the causes, scope and factors associated with medical errors among nursing students. The aim of this study is to assess the relationship between nursing students' medical error tendency levels, their personality types, and their assertiveness levels.

Research Questions

1. Nursing students' tendency to medical errors, Type A personality traits and assertiveness levels?

2. Is there a correlation between the sociodemographic attributes of nursing students and their propensity for medical errors, assertiveness, and type? A character trait?

3. Is there a relationship between nursing students' tendency to medical errors and assertiveness?

MATERIAL AND METHODS

DESIGN

The research used a descriptive and cross-sectional design. It was planned and reported in accordance with the checklist that is used to record descriptive studies, is known as the Strengthening the Reporting of OBservational studies in Epidemiology checklist.

SAMPLE AND SETTING

This research was carried out at a nursing faculty in the Central Anatolia Region of Türkiye from March to June 2023. The 4-year undergraduate education in the nursing faculty is given in 8 semesters and consists of a total of 240 European Credit Transfer and Accumulation System. The study's target population comprised nursing students (n=210) who completed the theory and practice of the internal medicine nurs-

ing course registered in the nursing department in 2022-2023. Nursing students acquire clinical skills for the 1st time in their 1st year and continue in their 2nd year. They go to medical and surgical clinics within the scope of the internal medicine nursing course, which is the 1st course where they can apply these skills and encounter medical errors. Students in the 3rd and 4th years were excluded from the study because they were in different fields and hospitals in units such as school health, family health and pediatrics outside of clinical units. For this reason, students taking the internal medicine nursing course were included in the study. Cohen's sample size calculation formula for known target populations determined the minimum number of participants to be 137, with a 95% confidence interval (α=0.05, table value 1.96), with a sampling error of d=0.05, p=0.50, and q=0.5.[17,18] Inclusion criteria were that students had completed their practice in surgery and internal medicine clinics (being a 2nd-year student) and engaged in the research willingly. Exclusion criteria were those doing practice in the outpatient clinic and those who did not continue their practice and failed the course. The research involved 193 students who satisfied the inclusion criteria and consented to participate.

DATA COLLECTION AND MEASUREMENT TOOL

Data were collected using a Personal Information Form, Nursing Medical Error Tendency Scale, Type A Personality Scale and A Rathus Assertiveness Inventory.

Personal Information Form: The tool questions the students' sociodemographic characteristics (age, gender, marital status, etc. 5 items), academic experiences (grade level, internship status, etc. 4 items), and sharps injury incidents and experiences (number of injuries, conditions, reporting, etc. 4 items) by the researchers.[1,4-8]

The Medical Error Proneness Scale in Nursing: The measure was created by Özata and Altunkan to assess nurses' proclivities for committing medical errors. The 5-point Likert scale comprises 49 items distributed over 5 sub-dimensions: medication and transfusion procedures (18 items), falls (5 items), hospital infections (12 items), patient monitoring/supply safety (9 items), and communication (5 items). The Cronbach's alpha value of the scale is 0.95, with sub-dimensions ranging from 0.85 to 0.96.[19] The Cronbach's alpha value of the scale in this investigation was determined to be 0.95.

Type A Personality Scale: The scale was developed by Batıgün and Şahin in order to determine Type A personality traits such as competitiveness, impatience and success orientation.[20] Cronbach's alpha value of the scale was 0.48-0.79 in the 1st sample and 0.40-0.72 in the 2nd sample for the sub-dimensions; 0.86 in the 1st sample and 0.90 in the 2nd sample for the whole. The Cronbach's alpha value of the scale was found to be 0.89 in this study. The total score that can be obtained from the scale varies between 25-125, and higher scores indicate that the individual has a type A personality.

Rathus Assertiveness Inventor: The scale was developed by Rathus to measure assertiveness in interpersonal relationships. The scale, which is a 6-point Likert type, has 30 items with positive and negative expressions. The reliability of the test is 0.78 with test-retest analysis.[21] The Turkish validity and reliability of the scale were made by Voltan.[22] The reliability of the Turkish adaptation of the scale was evaluated with the test-retest method and was found to be 0.92. The reliability coefficient of the scale was found to be 0.81 in this study. As the score obtained from the scale increases, assertiveness increases and as it decreases, shyness increases. Those who receive a total score below +10 from the inventory are considered shy and those who receive a score of +10 and above are considered assertive.

DATA COLLECTION

Upon acquiring the requisite government approvals, students enrolled in the nursing department of the pertinent universities, who satisfied the inclusion criteria, were apprised of the study's objectives, and their written consent was secured. The researchers collected data using face-to-face surveys conducted in a classroom setting from March to June 2023.

DATA ANALYSIS

Data analysis was conducted utilizing the SPSS version 22.0 (IBM, United States) software. The Kol-

mogorov-Smirnov test was employed to confirm the normality of the data distribution. Descriptive analyses were presented as numerical values, percentages, means, and standard deviations. Comparative analyses employed one-way analysis of variance and Pearson correlation. In Pearson correlation, the absolute values of r are classified as follows: 0-0.19 indicates a very weak correlation, 0.2-0.39 signifies a moderate correlation, 0.40-0.59 represents a medium connection, 0.6-0.79 denotes a strong correlation, and 0.8-1 indicates a very strong correlation.[23] The data was deemed statistically significant at $p<0.05$.

ETHICS OF RESEARCH

Prior to the research, Selçuk University Faculty of Nursing Local Ethics Committee approval was obtained (date: December 29, 2022; no: 2022/77). Institutional approval has been obtained from Selçuk University Faculty of Nursing (No: 458685). The research adhered to the Helsinki Declaration of Human Rights and ethical norms at all stages. The students participating in the research were informed about the purpose of the study and the data collection tools, their written informed consent was.

RESULTS

Participant Descriptive Characteristics: The participants had an average age of 20.24±1.04 years and their overall academic grade point average was 2.93±0.39. It was determined that 86% of the participants were female, and 82.4% perceived their economic status as moderate. The mothers of 51.3% of the participants had primary education, while 30.6% of the fathers had high school education. 97.4% of the participants were native Turkish speakers, while 36.3% engaged with field-specific scholarly publications. During clinical practice, 23.8% of the participants experienced injuries from sharp objects, 24.4% came into contact with patient blood or contaminated materials, 1.6% made medical errors and 2.1% made medication dosage errors (Table 1).

Scale Score Averages of Nursing Students: The mean scores and reliability coefficients for the scales are presented in Table 2, indicating that the scales are valid and reliable.

TABLE 1: Descriptive and medical error-related characteristics of nursing students (n=193)

Variables	X̄±SD	%
Age	20.24±1.04	
GPA	2.93±0.39	
IPA	68.53±10.26	
Gender		
Female	166	86
Male	27	14
Perception of economic situation		
Good	15	7.8
Middle	159	82.4
Bad	19	9.8
Native tongue		
Turkish	188	97.4
Other	5	2.6
Following scientific publications		
Yes	70	36.3
No	123	63.7
Cutting instrument injury		
Yes	46	23.8
No	147	76.2
Contaminated material contact		
Yes	47	24.4
No	146	75.6
Medication administration errors		
Yes	3	1.6
No	190	98.4
Incorrect drug dose administration		
Yes	4	2.1
No	189	97.9

SD: Standard deviation; GPA: General academic grade point average; IPA: internal medicine nursing course grade point average

TABLE 2: Scale score averages of nursing students (n=193)

Scales and sub-dimensions	X̄±SD	Cronbach alpha coefficient
Nursing Medical Error Proneness Scale	213.08±24.72	0.958
Medication and transfusion applications	81.24±8.38	0.914
Falls	21.23±3.48	0.836
Hospital infections	53.27±6.24	0.871
Patient monitoring and material safety	37.04±5.95	0.832
Communication	20.31±4.54	0.824
Rathus assertion inventory	-11.32±23.47	0.813
Type A Personality Scale	73.79±15.57	0.895

SD: Standard deviation

Comparison of Medical Error Tendency Scale Scores of Nursing Students According to Sociodemographic Characteristics and Some Variables: When comparing participant characteristics with the mean scores on the Medical Error Propensity

Scale, a significant correlation was found between the medication and transfusion applications sub-dimension and both the status of following field-specific scientific publications and contact with patient blood or contaminated materials. Participants who followed field-specific scientific publications and those who did not come into contact with patient blood or contaminated materials had significantly higher mean scores ($p<0.05$). In the falls sub-dimension, participants who did not make medical errors and those who did not make medication dosage errors had significantly higher mean scores ($p<0.05$). No significant correlation was found in the hospital infections sub-dimension ($p>0.05$). In the patient monitoring and material safety sub-dimension, participants who followed field-specific scientific publications had significantly higher mean scores ($p<0.05$). In the communication sub-dimension, participants with a good economic status had significantly lower mean scores compared to those with moderate or poor economic status, while participants whose fathers were literate had significantly higher mean scores compared to those whose fathers had primary education or higher (Table 3).

Comparison of Nursing Students' Rathus Assertiveness Inventory and Type A Personality Scale Mean Scores According to Sociodemographic Characteristics and Some Variables: Examining the mean scores of participants on the Rathus Assertiveness Schedule, those who made medication administration errors had significantly higher mean scores compared to those who did not make such errors ($p<0.05$). No significant correlation was found between the total mean scores of the Type A Personality Scale and participant characteristics ($p>0.05$). In the sub-dimensions, no significant correlation was found in the withdrawal from work or social activities sub-dimensions. However, in terms of the importance given to the speed sub-dimension and the importance given to the timing sub-dimension, participants with a good economic status had significantly higher mean scores compared to those with a moderate economic status ($p<0.05$) (Table 4).

Correlation Between Total and Component Mean Scores of the Medical Error Assertiveness Scale and Total Scores of the Rathus Assertiveness Inventory and Type A Personality Scale: Examining the relationships between the scales, a negative and very weakly significant correlation was found between the medication and transfusion applications sub-dimension of the Medical Error Propensity Scale and the Rathus Assertiveness Schedule, while a positive and very weakly significant correlation was found with the total score of the Type A Personality Scale and the importance given to speed sub-dimension ($p<0.05$). A positive and very weakly significant correlation was found between the medical error propensity scale and the patient monitoring and material safety sub-dimensions and the importance given to the speed sub-dimension of the Type A personality scale ($p<0.05$). A negative and very weakly significant correlation was found between the Rathus assertiveness schedule and the importance given to the timing sub-dimension of the type A personality scale ($p<0.05$) (Table 5).

DISCUSSION

In this study, the relationship between some sociodemographic characteristics, assertiveness and personality types of nursing students and their propensity for committing medical errors was analyzed. Literature indicates that nurses and nursing students are particularly susceptible to medical blunders.[24,25] Research indicates that about 50% of nursing students commit medical errors (ranging from 28.3% to 58.8%), with medication errors being the most prevalent form.[4-8,24,25] The prevalence of medication errors made by students during clinical practice varies between 1.1-6%.[26] In this study, the medication administration error rate was determined as 1.6% and the medication dosage error rate as 2.1%. Medication errors, such as calculation errors, wrong patient, wrong medication, or neglect of medication administration, can occur due to student, education and environmental factors.[26,27] It is observed that student nurses who perform medication and transfusion administrations independently of the nurse have a higher tendency for medical errors than student nurses who perform them together with the nurse.[5] Although the prevalence of medication errors is 40%, it is stated that there is inadequate reporting of these errors.[1,28] In this study, the low rates of reporting medication errors can be

TABLE 3: Comparison of Medical Error Tendency Scale scores of nursing students according to sociodemographic characteristics and some variables

Variables	Medication and transfusion applications	Falls	Hospital infections	Patient monitoring and material safety	Communication	Nursing Medical Error Proneness Scale
Age					p=0.065	r=-0.080
						p=0.677
GPA						r=-0.030
						p=0.270
IPA						r=0.006
						p=0.939
	X̄±SD	X̄±SD	X̄±SD	X̄±SD	X̄±SD	X̄±SD
Gender						
Female	81.56±8.29	21.34±3.35	53.56±5.90	37.18±5.89	20.39±4.57	214.02±24.18
Male	79.26±8.85	20.56±4.19	51.52±7.98	36.15±6.36	19.81±4.43	207.30±2763
t value	1.325	1.083	1.582	0.836	0.605	1.314
p value	0.187	0.280	0.115	0.404	0.546	0.190
Economic situation						
Good [1]	78.27±6.97	19.73±3.95	51.60±6.14	34.67±6.48	16.93±6.45	201.20±25.16
Middle[2]	81.30±8.16	21.25±3.31	53.42±6.01	37.02±5.88	20.48±4.23	213.47±23.78
Bad[3]	83.05±10.80	22.26±4.23	53.37±8.21	39.05±5.73	21.53±4.36	219.26±30.07
F	1.397	2.254	0.583	2.313	5.148	2.379
p value	0.250	0.108	0.559	0.102	0.007	0.095
Significance*					1<2,3	
Native tongue						
Turkish	81.21±8.38	21.21±3.50	53.24±6.27	36.97±5.96	20.23±4.56	212.86±24.72
Other	82.20±9.68	22.00±2.83	54.60±5.77	39.40±5.59	23.20±2.49	221.40±26.05
t value	-0.259	-0.502	-0.480	-0.900	-1.448	-0.761
p value	0.796	0.617	0.632	0.369	0.149	0.447
Following scientific publications						
Yes	82.86±7.52	21.91±2.96	53.84±6.12	38.27±5.15	21.06±3.95	217.94±21.89
No	80.32±8.73	20.84±3.70	52.95±6.31	26.33±6.27	19.88±4.81	210.32±25.88
t value	**2.040**	2.084	0.954	2.318	1.743	2.078
p value	**0.043**	0.038	0.342	0.022	0.083	0.039
Cutting instrument injury						
Yes	79.78±8.83	20.74±3.23	52.13±6.58	36.09±6.20	19.70±4.37	208.43±23.92
No	81.69±8.22	21.38±3.55	53.63±6.12	37.33±5.86	20.50±4.59	214.54±24.87
t value	-1.352	-1.092	-1.428	-1.242	-1.044	-1.465
p value	0.178	0.276	0.155	0.216	0.298	0.144
Contaminated material contact						
Yes	78.94±8.73	20.45±3.15	52.87±5.26	37.02±5.51	20.45±3.97	209.72±22.69
No	81.98±8.16	21.48±3.55	53.40±6.54	37.04±6.10	20.26±4.72	214.16±25.32
t value	**-2.185**	-1.779	-0.507	-0.20	0.244	-1.071
p value	**0.030**	0.077	0.613	0.984	0.807	0.285
Medication administration errors						
Yes	73.33±14.15	17.00±2.65	54.00±3.61	36.33±2.52	22.67±2.08	203.33±20.74
No	81.36±8.26	21.29±3.46	53.26±6.28	37.05±5.99	20.27±4.56	213.24±24.80
t value	-1.653	-2.140	0.202	-0.206	0.907	-0.687
p value	0.100	0.034	0.840	0.837	0.366	0.493
Drug dosage errors						
Yes	75.25±10.05	16.75±6.13	46.75±10.87	36.25±7.27	17.75±9.00	192.75±40.28
No	81.37±8.33	21.32±3.37	53.41±6.08	37.05±5.94	20.36±4.43	213.51±24.28
t value	-1.448	-2.640	-2.131	-0.266	-1.138	-1.670
p value	0.149	0.009	0.034	0.790	0.257	0.097

SD: Standard deviation; t: Independent samples t-test; F: One way analysis of variance test. r: Pearson correlation

TABLE 4: Comparison of nursing students' Rathus Assertiveness Inventory and Type A Personality Scale mean scores according to sociodemographic characteristics and some variables

	Rathus Assertiveness Inventory total score	Type-A Personality Scale total score
Age	r=-0.272	r=0.052
	p<0.001	p=0.472
GPA	r=0.026	r=-0.069
	p=0.718	p=0.341
IPA	r=0.113	r=-0.004
	p=0.118	p=0.957
Gender		
Female	-12.26±23.44	73.47±15.18
Male	-5.52±23.27	75.74±17.94
t value	-1.387	-0.702
p value	0.167	0.484
Economic situation		
Good[1]	-14.73±21.38	77.73±18.96
Middle[2]	-9.92±22.79	72.73±14.86
Bad[3]	-20.26±29.19	79.53±17.56
t value	1.835	2.166
p value	0.163	0.117
Native tongue		
Turkish	-11.24±23.61	73.48±15.37
Other	-14.20±19.58	85.20±20.66
t value	0.278	-1.669
p value	0.782	0.097
Following Scientific Publications		
Yes	-13.23±22.04	73.87±15.14
No	-10.23±24.27	73.74±15.87
t value	-0.853	0.056
p value	0.395	0.955
Cutting Instrument Injury		
Yes	-7.87±23.12	71.80±13.60
No	-12.39±23.56	74.41±16.13
t value	1.142	-0.990
p value	0.255	0.323
Contaminated Material Contact		
Yes	-8.94±20.66	76.19±14.96
No	-12.08±24.32	73.01±15.73
t value	0.798	1.219
p value	0.426	0.224
Medication administration errors		
Yes	17.00±20.78	75.33±10.12
No	-11.76±23.28	73.76±15.65
t value	2.125	0.173
p value	0.035	0.863
Drug dosage errors		
Yes	-10.75±18.21	80.25±30.32
No	-11.33±23.61	73.65±15.23
t value	0.028	0.838
p value	0.181	0.403

GPA: General academic grade point average; IPA: internal medicine nursing course grade point average; r: Pearson correlation; t: Independent samples t-test; F: One-way analysis of variance test

explained by various reasons. Fear of punishment and stigmatization are important obstacles to students reporting errors. Stolic et al. state that students are afraid of negative consequences they may encounter when they report their errors and therefore prefer to hide their errors.[26] Another reason is that students have low awareness levels regarding error reporting. Inadequate training and information regarding error reporting during the education process may cause students to be uncertain about which situations should be reported. Studies have shown that the frequency of nursing students experiencing a sharps injury at least once is between 27.8-62.6%. This experience can occur with clean material before the procedure or with contaminated material after the procedure.[29-31] In a state university hospital, 50% of the sharps injuries that occurred in one year were committed by students.[29] In this study, the rate of sharps injuries during clinical practice was determined as 23.8% and the rate of contact with patient blood or contaminated material was determined as 24.4%, showing similar results to the literature.

The personality structures of nursing students directly affect their ability to cope with the challenges they encounter during their education and clinical practice. The Type A Personality Scale plays a critical role in assessing these personality structures. Individuals with Type A personalities are generally more productive, hardworking and ambitious, which can increase their academic and professional success. However, these characteristics can also lead to negative outcomes such as high work stress and distancing from social activities. Individuals with type B personalities have a calmer, more relaxed and more balanced structure, which can positively affect their ability to cope with stress.[11] In one study, it was found that 59.7% of nursing and midwifery students had Type A personalities.[13] This finding shows that type A personality traits are common among healthcare professionals. On the other hand, it was determined that as the importance given to work by nurses with type A personality traits increased, they distanced themselves from social activities and started to do their jobs faster.[32] This finding shows that Type-A personality traits may increase the tendency to make medical errors.

TABLE 5: Correlation between total and component mean scores of the Medical Error Assertiveness Scale and total scores of the Rathus Assertiveness Inventory and Type A Personality Scale

Medication and transfusion applications	Falls	Hospital infections	Patient monitoring and material	Communication	Medical Error Proneness Scale	Rathus Assertiveness Inventory	Type A Personality Scale total score
1. Medication and transfusion applications	r=0.716**	r=0.7681**	r=0.6621**	r=0.5341**	r=0.891**	r=0.0921**	r=0.1511**
2. Falls		r=0.7381**	r=0.6711**	r=0.5461**	r=0.8321**	r=-0.070 p=0.334	r=0.122 p=0.090
3. Hospital infections			r=0.7401**	r=0.5991**	r=0.9051**	r=-0.060 p=0.404	r=0.071 p=0.328
4. Patient monitoring and material safety				r=0.7171**	r=0.8781**	r=-0.092 p=0.203	r=0.094 p=0.195
5. Communication					r=0.7651**	r=-0.056 p=0.441	r=0.022 p=0.766
6. Medical Error Proneness Scale total score						r=-0.089 p=0.220	r=0.113 p=0.118
7. Rathus Assertiveness Inventory Inventory total score							r=-0.112 p=0.120
8. Type A Personality Scale total score							

*p<0.05; **p<0.001. r: Pearson correlation

Since the nursing profession requires skills such as effective communication, decision-making and problem-solving. The degree of assertiveness is crucial in the implementation of these skills.[14-16] This finding shows that nursing students cannot be assertive enough in social and professional environments. The literature emphasizes that shyness is a common characteristic among healthcare professionals and that this can have negative effects on communication skills and patient relationships. Shyness can make it difficult for students to express themselves in clinical settings, which can increase the risk of making medical errors.[14-16] This study is similar to the literature in this respect. Assertiveness, which is a skill that can be developed, can be examined and supported in student nurses, and students will be able to cope with the stress they encounter in their lives more easily, and thus their personal and professional skills will increase. Nurses must be trained to demonstrate self-confidence and assertiveness to enhance the quality of development and care in the nursing profession.[32,33] In a comprehensive review of the effectiveness of assertiveness training interventions in nursing, it has been proven that group work, role playing, feedback sessions and interactive training materials, which have an important place in nursing assertiveness training.[34] Such treatments effectively enhance the professional competencies of nursing students and nurses. In this context, it is reported that organizing nursing training programs to include assertiveness training will make significant contributions in terms of both individual and professional development.

LIMITATIONS

This research possesses limitations that may influence the generalizability and reliability of its results. The employed cross-sectional design is incapable of identifying causal relationships among variables. It exclusively targets nursing students at a specific university and is exclusive to internal medicine-surgery clinics. Another issue is that dependence on self-report measures may result in reporting bias. Since the nursing profession requires skills such as effective communication and decision making, assertiveness plays a critical role in the successful application of these competencies.

CONCLUSION

The findings of this study reveal that the personality traits and assertiveness levels of nursing students have significant effects on their tendency to make medical errors. In this context, it is recommended to implement various strategies in nursing education and clinical practices. Educational modules aimed at developing students' communication and assertiveness skills should be included in the nursing curriculum. These modules can focus on developing students' decision-making and problem-solving skills by using scenarios related to patient safety and error management. In clinical practice processes, it is important to implement one-on-one supervision programs aimed at meeting students' individual needs. In this context, it is thought that regular observation and feedback mechanisms provided by experienced nurses and clinical instructors can be effective in preventing medication errors. In addition, in order to contribute to students' recognition of their individual differences and development of stress coping skills, workshops focused on personality and stress management should be planned under expert guidance. In clinical practices, it is recommended to establish a secure error reporting system. This system should reduce students' fear of making mistakes and allow them to express their errors openly, and this process should be used for educational purposes. Students' error awareness and safety awareness can be increased by using realistic simulations in medication administration and patient safety. It is important to include randomized controlled trials in future studies to evaluate the effectiveness of these suggested strategies. In addition, examining customized educational approaches suitable for different personality traits and assertiveness levels can contribute to the development of more effective methods for preventing medical errors.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Ülkü Saygılı Düzova;* ***Design:*** *Ülkü Saygılı Düzova;* ***Control/Supervision:*** *Ülkü Saygılı Düzova, Ayyüce Tuba Koçak;* ***Data Collection and/or Processing:*** *Mustafa Kılıç, Ayyüce Tuba Koçak, Nurseza Akgöz;* ***Analysis and/or Interpretation:*** *Mustafa Kılıç, Ülkü Saygılı Düzova;* ***Literature Review:*** *Mustafa Kılıç;* ***Writing the Article:*** *Ülkü Saygılı Düzova, Mustafa Kılıç, Ayyüce Tuba Koçak, Nurseza Akgöz;* ***Critical Review:*** *Ülkü Saygılı Düzova;* ***References and Fundings:*** *Mustafa Kılıç;* ***Materials:*** *Ayyüce Tuba Koçak;* ***Other:*** *Ülkü Saygılı Düzova.*

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