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Journal of Nursology

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The target audience of the journal includes nurses, academicians, clinical researchers, medical/health professionals, students, nursing professionals, and related professional and academic bodies and institutions.

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Nursing Students Evaluate the Hidden Curriculum in Their Faculties: A Cross-Sectional Study

Hemşirelik Öğrencileri Fakültelerindeki Örtük Müfredatı Değerlendiriyor: Kesitsel Bir Çalışma

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ABSTRACT

Objective: The aim of this study is to determine how nursing students evaluate the hidden curriculum in their faculty.

Methods: The study has a descriptive and cross-sectional design. The population of the study consists of first, second, third, and fourth-year nursing students attending the fall and spring semesters of the 2021-2022 academic year at a university's nursing faculty. A total of 288 students participated in the study. The data were collected online by the "General Information Form", "Hidden Curriculum Evaluation Scale in Nursing Education". In the study, the data were evaluated with t test and one-way analysis of variance.

Results: In the study, the mean total score of the Hidden Curriculum Evaluation Scale in Nursing Education was determined to be 161.99 (± 25.30). The mean scores for the sub-dimensions of the scale were 71.01 (± 12.32) for school climate, 48.75 (± 11.09) for professional attainments, and 42.23 (± 8.38) for student-teacher-school interaction. It was determined that students evaluated the hidden curriculum in their faculties at above a moderate level and that their perception of the hidden curriculum differed according to gender, age, grade level, career preferences and level of knowledge on the subject.

Conclusion: It is extremely important for institutions and educators to be aware of the hidden curriculum and to pay attention to the role of professional values, norms and behaviors.

Keywords: Hidden curriculum, nursing education, nursing student, professionalism

ÖZ

Amaç: Bu çalışmanın amacı, hemşirelik öğrencilerinin fakültelerindeki örtük müfredatı nasıl değerlendirdiklerini belirlemektir.

Yöntemler: Çalışma tanımlayıcı ve kesitsel bir tasarımıdır. Çalışmanın evreni, 2021-2022 eğitim-öğretim yılı güz ve bahar dönemlerinde bir üniversitenin hemşirelik fakültesinde öğrenim gören 1., 2., 3. ve 4. sınıf hemşirelik öğrencilerinden oluşmaktadır. Çalışmaya 288 öğrenci katıldı. Veriler "Genel Bilgi Formu" ve "Hemşirelik Eğitiminde Örtük Program Değerlendirme Ölçeği" kullanılarak çevrim içi olarak toplandı. Çalışmada veriler t testi ve tek yönlü varyans analizi ile değerlendirildi.

Bulgular: Çalışmada, öğrencilerin Hemşirelik Eğitiminde Örtük Program Değerlendirme Ölçeği toplam puan ortalaması 161,99 ($\pm 25,30$) olarak belirlenmiştir. Ölçeğin alt boyutlarına ait puan ortalamaları ise okul iklimi için 71,01 ($\pm 12,32$), mesleki kazanımlar için 48,75 ($\pm 11,09$) ve öğrenci-öğretmen-okul etkileşimi için 42,23 ($\pm 8,38$) olarak saptanmıştır. Öğrencilerin fakültelerindeki örtük müfredatı orta düzeyin üzerinde değerlendirdikleri ve örtük müfredat algılarının cinsiyete, yaşa, sınıf düzeyine, kariyer tercihlerine ve konuyla ilgili bilgi düzeyine göre farklılık gösterdiği belirlenmiştir.

Sonuç: Kurumların ve eğitimcilerin örtük müfredatın farkında olmaları ve mesleki değerlerin, normların ve davranışların oluşumunda rolüne dikkat etmeleri son derece önemlidir.

Anahtar Kelimeler: Örtük program, hemşirelik eğitimi, hemşirelik öğrencisi, profesyonellik



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INTRODUCTION

Education is an important process that directly affects the future lives of individuals. The aim of nursing education is to enable students to acquire the knowledge and skills necessary to fulfill their professional nursing roles and to assume social responsibilities.¹ The graduate profile of universities shows that, not all intended learning outcomes are achieved, and students may graduate with undesired learning outcomes.^{2,3} These results reveal the need to focus on how and what students learn during their undergraduate education.

The hidden curriculum includes “organizational, institutional, and cultural patterns of values and behavior that shape how and what students learn outside of the formal and intended curriculum”.⁴ The knowledge, opinions, perceptions, attitudes, principles and values that students acquire outside of the objectives and activities specified in formal curriculum practices are the result of the hidden curriculum.⁵ The formal curriculum describe theoretical frameworks that aim to develop best practice, while hidden curricula refer to practices that serve to sustain existing culture.⁶ The formal curriculum includes structured academic content such as topics, courses, and specific learning outcomes. The hidden curriculum includes informal social processes such as role modeling, conversations and interactions between faculty members and students, more implicit forces of organizational life such as power and obedience, and many other factors such as the school atmosphere and the architectural layout of the school.^{2,4} Since these factors differ across universities, the hidden curriculum differs according to each institution.⁷ The hidden curriculum continues naturally within the school culture, affecting students in planned or unplanned ways. Students typically learn behaviors and values that shape their professional identities (such as empathy, communication, teamwork, and ethics) by observing, modeling, and interacting with their peers, faculty members, and institutional administrators.^{4,8,9} In the learning process of students, the perspectives, thoughts, and behaviors of administrators, teachers, and students may be more influential than the planned program itself. Karimi et al.¹⁰ noted in his study that nursing students learn their professional identities through the hidden curriculum.¹⁰ Therefore, students are significantly influenced by the hidden curriculum.¹¹⁻¹³

Attitudes and behaviors such as professional ethics, professionalism, empathy skills, communication, and professional commitment are the most fundamental values

in the provision of quality and safe care for nurses.^{2,14,15} The teaching of professional nursing behaviors in accordance with the curricula influences the quality of nursing care provided.¹⁶ Students can prepare for adult professional roles, internalize professional values and develop professional identity through the hidden curriculum.^{4,14,17,18} It has been reported in the literature that the hidden curriculum could affect nursing students’ professional behaviors and practices, their socialization, and the development of their professional values and cultural competencies both positively and negatively.^{6,10,14,15,18-20} Therefore, recognizing and assessing the hidden curriculum is important for the development of nursing students’ professional identities and ethical competencies. A well-developed professional identity with ethical competence contributes to the development of the nursing profession and the provision of higher quality health care.^{6,14,21} Therefore, it is very important that the values related to ethics, professional commitment, communication and professionalism in the formal curriculum in undergraduate education are compatible with the hidden curriculum and that these values form the basis of the culture of the institution.

The hidden curriculum has a significant impact on students’ learning outcomes and future professional practice.^{12,14,20-22} The literature suggests that it is important to understand the nature of the values and messages communicated through the hidden curriculum, as students internalize the messages in the hidden curriculum more easily and consider them as more effective than the formal curriculum.^{4,20,23,24} Akçakoca and Orgun² emphasized that educational institutions that want to improve the quality of their graduates should investigate their hidden curricula and identify the implications of education and manage them according to the objectives of the educational program.²

AIM

This study aimed to determine how nursing students studying in a nursing faculty evaluate the hidden curriculum in their faculties.

Research question

Accordingly, the research question of this study is:

- How do nursing students studying at a nursing faculty evaluate the hidden curriculum in their faculties?

METHODS

Study design

The study is descriptive and cross-sectional.

Setting and participants

The population of the study consisted of 1st, 2nd, 3rd and 4th grade students who were attending the fall and spring semesters of 2021-2022 academic year at faculty of nursing in a university. Nursing faculty is a 4-year undergraduate nursing college in Turkey that provides education in the Bachelor of Science in Nursing program. Data were collected from October 2021 to February of 2022. There are a total of 685 students studying in the nursing department. It was planned to include the entire population in the study without selecting a sample. There were no explicit exclusion criteria if a student met the inclusion criteria. Finally, data from 288 volunteer participants were analyzed. The post-hoc power obtained for the accessible sample size was calculated using the G-Power 3.1.9.7 package program. The power of the study was determined as 94% in the analysis conducted in the four-group sample with a margin of error of 0.05, a sample size of 288, and an effect size of 0.241, and it was determined that the sample size was sufficient.

Data Collection and Instruments

The data related to the dependent variable were collected online by the "General Information Form", "Hidden Curriculum Evaluation Scale in Nursing Education" (HCES-N)". The data collection tools of the research were created as an online questionnaire form on the internet. Online data collection forms were delivered to the research sample via announcing through e-mail, social media (Twitter, Instagram, WhatsApp, etc.) and the faculty website. The data collection form includes a preliminary information page in which the purpose of the study is explained, and the students confirm that they accept voluntary participation. The students who agreed to participate in the study selected the "I agree to participate in the study" option, then answered the questionnaire and scale including the "General Information Form" and the "Hidden Curriculum Evaluation Scale in Nursing Education". Among all participants who received low, medium and high scores from the scale, those voluntary students to participate received a questionnaire with 14 open-ended questions related to the scale via e-mail that aimed to learn the students' evaluations of the hidden curriculum in depth, in the data collection phase of the HCES-N.

Then, a survey form consisting of open-ended questions was sent to the e-mails of students with low, medium and high scores on the scale. These open-ended questions, created by selecting from the scale items, were asked to determine whether student opinions support the quantitative findings and to obtain students' opinions about the hidden curriculum. Nineteen volunteer students have responded to the survey sent to the students' emails.

General Information Form: This form was created by researchers through literature search in order to collect descriptive information of students^{2,25} It consists of 6 questions about student nurses' grade, gender, age, general academic achievement, reason for choosing nursing profession and whether they have knowledge about the hidden curriculum or not.

Hidden Curriculum Evaluation Scale in Nursing Education (HCES-N):

The scale for the evaluation of the hidden curriculum in nursing education by nursing students, was developed by Akçakoca & Orgun.² It is a five-point Likert type scale and consists of 43 items and 3 sub-dimensions. Each item in the scale is scored between 'always (5)' and 'never (1)'. The 13 items in the scale (items; 13, 18, 20, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43) are reverse scored. The lowest score that can be obtained from the total scale is 43 and the highest score is 215. High scores on the scale are interpreted as the hidden curriculum of the institution is compatible with the official program and develops desired characteristics in students. In the scale, the "School climate" sub-dimension consisted of 21 items (items 1-21) and Cronbach's Alpha value was 0.913; the "Professional attainments" sub-dimension consisted of 12 items (items 22-33) and Cronbach's Alpha value was 0.888; the "Student-teacher-school interaction" sub-dimension consisted of 10 items (items 34-43) and Cronbach's Alpha value was 0.765. The Cronbach alpha reliability coefficient of the scale is 0.91. In this study, the Cronbach's alpha reliability coefficients of the scale were determined to be 0.94 for the total score, 0.87 for the school climate sub-dimension, 0.97 for the professional attainments sub-dimension and 0.91 for the student-teacher-school interaction sub-dimension.

Open-ended Question Form: It consists of 14 statements prepared by the researchers based on the scale items in order to examine students' opinions on the hidden curriculum. The statements in the form are given below. The students were instructed to complete the these given sentences.

1. *I think/do not think that the courses at school respond to the personal development needs of students. Because, ...*
2. *I think/do not think that I am satisfied with the education I received at school. Because,...*
3. *I think/do not think that the education I received at school is sufficient for my profession. Because, ...*
4. *I think/do not think that there is good cooperation and communication between teaching staff and students at the school. Because,...*

5. *I think/do not think that lecturers/instructors have a positive attitude towards the nursing profession? Because,...*
6. *I feel/do not feel that I am a part of the school during the education I receive at the school. Because,...*
7. *I think/do not think that the rules and regulations at school are applied fairly to everyone. Because,...*
8. *I think/do not think that the lecturers, their attitudes and behaviors are good role models for us. Because,...*
9. *I think/do not think that I have learned to respect the values, beliefs and opinions of people (patients, relatives, other health personnel, etc.) and to communicate well with them during my education at school. Because,...*
10. *I think/do not think that I have learned that professional ethical principles are important in nursing practice. Because,...*
11. *I think/do not think that nursing is a valuable and valid profession in society. Because,...*
12. *I think/do not think that there is gender discrimination in school/clinical practices. Because,...*
13. *I think/do not think that lecturers are more understanding and polite to students they find close to themselves. Because,...*
14. *I think/do not think that there is an oppressive attitude at school. Because,...*

Analysis of Data

Statistical analyses were performed using SPSS 21 version (IBM SPSS Corp., Armonk, NY, USA) statistical software. The differences in hidden curriculum according to participants' demographic characteristics were confirmed via an independent t-test, one-way analysis of variance, and Tukey HSD post hoc test. Tests of normality of the main variables were performed using the Kolmogorov-Smirnov test and skewness and kurtosis tests. A value of $P < .05$ was accepted as the level of significance in all statistical analyses.

Data on open-ended questions about participants' opinions on the hidden curriculum were analyzed using content analysis method, which requires a subjective textual interpretation of the content of the data to be made through a process of systematic classification.²⁶ The statements were then transcribed by the researchers and a raw data document was created in Microsoft word. The data were analyzed independently by two researchers. The responses "(I think/ do not think" answers) to the statements were presented quantitatively as frequency. The written answers given in the statements were carefully read by the researchers, similar answers were grouped under the same heading and after reaching a consensus,

they were grouped under three headings (school climate, professional attainments, student-teacher interaction) and presented under the frequencies of "I think/ do not think". The results are summarized in Table 3. Some statements of students' opinions are also included in the findings.

Ethical Approval

The study protocol was approved by the Ethics Committee of Ankara University (Decision Date: 25/10/2021, Number: 16/178), and institutional permission was granted. Informed consent was obtained from all students participating in the study. The research conforms to the provisions of the Declaration of Helsinki (as revised in Brazil 2013).

RESULTS

Most participants were women (85.8%) and aged between 21-22 years (46.5%), most students rated their academic achievement as good (56.9%), and the majority of students chose their profession willingly (35.8%). Among the participant students, 70.5% stated that they had no knowledge about the hidden curriculum. Sociodemographic data of the students are presented in Table 1.

Hidden curriculum differed significantly according to sociodemographic characteristics. Accordingly, being female showed a difference in the scale total score ($t = 5.495$; $P < .001$), school climate ($t = 5.395$; $P < .001$) and professional attainments ($t = 5.150$; $P < .001$) sub-dimensions, age variable showed a difference in the scale total score ($F = 2.592$; $P = .037$) and school climate sub-dimension ($F = 2.577$; $P = .038$), grade level showed a difference in scale total score ($F = 4.888$; $P = .002$), school climate ($F = 6.091$; $P < .001$) and student-teacher-school interaction ($F = 4.844$; $P = .003$) sub-dimensions, academic achievement showed difference only in the sub-dimension of school climate ($F = 3.194$; $P = .024$), and the variable of choosing the nursing profession showed difference in all sub-dimensions except for the student-teacher-school interaction sub-dimension and scale total score ($F = 0.975$; $P = .405$) ($P < .05$). All these findings are presented in Table 1.

The scores of the students regarding the Hidden Curriculum Evaluation Scale in Nursing Education (HCES-N) and its sub-dimensions are given in Table 2. The students' hidden curriculum evaluation scale in nursing education (161.99 ± 25.30) and the school climate (71.01 ± 12.32) sub-dimension scores were found to be at moderate level, while scores for the professional attainments (48.75 ± 11.09) and student-teacher-school interaction (42.23 ± 8.38) sub-dimensions were found to be at a higher level.

Table 1. Differences in HCES-N and Sub-dimensions According to Sociodemographic Characteristics (n=288)

		HCES-N and sub-dimensions			
Characteristics	n (%)	HCES-N Total Mean± Sd [†]	School climate Mean± Sd [†]	Professional attainments Mean± Sd [†]	Student-teacher- school interaction Mean± Sd [†]
Gender					
Female	247 (85.8)	165.17±23.01	72.53±11.44	50.06±10.22	42.57±8.37
Male	41 (14.2)	142.82±29.97	61.82±13.57	40.82±12.88	40.17±8.23
<i>t (P)</i>		5,495(<.001)	5.395(<.001)	5.150(<.001)	1.707(.089)
Age (years)					
18-19 (1)	12 (4.2)	179.50±23.57	79.50±11.26	53.91±6.99	46.08±7.03
19-20 (2)	125 (43.4)	164.56±23.54	72.08±11.60	49.37±10.98	43.09±8.49
21-22 (3)	134 (46.5)	158.80±26.55	69.68±12.86	47.98±11.47	41.13±8.23
23-24 (4)	13 (4.5)	155.76±24.05	66.30±11.29	46.07±10.53	43.38±5.51
25 age and over	4 (1.4)	156.25±24.11	71.50±12.44	48.00±12.35	36.75±15.34
<i>F(P)</i>		2.592(.037)	2.577(.038)	1.104(.355)	2.059(.086)
<i>Posthoc Tukey HSD</i>		1-3(.050)	1-2 (.045) 1-3 (.008) 1-4(.007)		
Academic level					
1.class (1)	62 (21.5)	173.19±24.02	76.48±11.86	50.37±10.19	45.33±6.95
2.class (2)	70 (24.3)	157.37±25.61	68.90±12.00	46.64±12.28	41.82±9.69
3.class (3)	123 (42.7)	160.91±24.14	70.41±11.74	48.73±11.04	41.76±7.78
4.class (4)	33 (11.5)	156.66±26.94	67.42±13.26	50.24±9.96	39.00±8.57
<i>F(P)</i>		4.888(.002)	6.091(<.001)	1.489(.218)	4.844(.003)
<i>Posthoc-TukeyHSD</i>		1-2 (.004) 1-3 (.020) 1-4(.021)	1-2 (.002) 1-3 (.007) 1-4 (.003)		1-2(.070) 1-3 (.028) 1-4 (.002)
Academic Achievement					
Perfect (1)	49 (17.0)	161.44±25.80	70.89±13.56	49.42±12.12	41.12±8.75
Good (2)	164 (56.9)	164.17±23.87	72.21±11.32	49.73±10.56	42.21±8.38
Medium (3)	68 (23.6)	158.92±27.72	69.41±13.22	46.54±11.24	42.97±8.44
Bad (4)	7 (2.4)	144.57±25.47	59.00±11.28	42.28±11.75	43.28±4.92
<i>F(P)</i>		1.867(.135)	3.194(.024)	2.209(.087)	0.497(.685)
<i>Posthoc Tukey HSD</i>			2-4 (.027)		
Nursing Profession Selection					
Voluntarily (1)	103 (35.8)	166.77±22.00	72.85±10.64	51.29±9.89	42.63±7.00
Incidentally (2)	28 (9.7)	148.89±28.03	64.21±12.39	43.78±11.17	40.89±9.31
On suggestion (3)	80 (27.8)	161.58±26.35	71.96±13.49	48.33±12.02	41.28±10.12
Other (4)	77 (26.7)	160.77±25.91	70.02±12.42	47.58±10.93	43.16±7.70
<i>F(P)</i>		3.908(.009)	4.052(.008)	4.118(.007)	0.975(.405)
<i>Posthoc Tukey HSD</i>		1-2(.005)	1-2 (.005) 1-3(.020)	1-2 (.008)	
Hidden Curriculum Information					
Yes (1)	19 (6.6)	169.26±24.36	77.78±12.55	52.42±8.30	39.05±12.66
Partly (2)	66 (22.9)	168.86±23.08	73.80±11.68	51.06±9.16	44.00±7.31
No (3)	203 (70.5)	159.07±25.62	69.46±12.19	47.65±11.72	41.95±8.13
<i>F(P)</i>		4.678(.010)	6.385(.002)	3.519(.031)	2.986(.052)
<i>Posthoc Tukey HSD</i>		2-3 (.017)	1-3 (.012) 2-3 (.032)	2-3 (.030)	

*P<.05; [†]Sd: Standard deviation; t: Independent groups t test; ANOVA: Analysis of variance; HCES-N: Hidden Curriculum Evaluation Scale in Nursing Education

Table 2. Descriptive statistics of students' HCES-N and sub-dimensions (n=288)

	Mean± SD	Minimum	Maximum
School climate	71.01±12.32	21.00	105.00
Professional attainments	48.75±11.09	12.00	60.00
Student-teacher-school interaction	42.23±8.38	10.00	50.00
HCES-N total	161.99± 25.30	43.00	215.00

SD: Standard deviation; HCES-N: Hidden Curriculum Evaluation Scale in Nursing

Table 3 shows the students' opinions on the hidden curriculum. This study enabled the students to express their evaluations about the hidden curriculum according to

their own views, which in turn provided a deeper understanding for this topic. The important topics/concepts that emerged through the opinions of the students were grouped according to the sub-dimensions of the scale, namely school climate, professional attainments and student-teacher-school interaction, and it was observed that positive opinions were given in all topics. However, in statements such as "meeting individual needs, being satisfied with the education received" in the school climate topic, students frequently expressed the inadequacy of the practical courses and the dissatisfaction they experienced due to this. The students' statements are given in Table 3.

Table 3. Students' Opinions on the Hidden Curriculum

Subheadings	Items	Students' opinions and frequency	
		I think	I do not think
School Climate	1. I think/do not think that the courses at school respond to the personal development needs of students. *	8 <i>"Knowing health and psychology courses teaches personal development socially and scientifically. Social, cultural and scientific activities are quite sufficient for a student"</i>	12 <i>"There is only theoretical knowledge, practical training is insufficient. The number of students is too high and needs are not met. We are not evaluated individually."</i>
	2. I think I am satisfied/not satisfied with the education I received at school. *	12 <i>"I can understand and feel the improvement in myself compared to before, the lessons are given the necessary importance"</i>	8 <i>"practical training is quite inadequate, course materials are inadequate, inelaborate training, no feedback is given, laboratory practices are inadequate"</i>
	3. I think/do not think that the education I received at school is professionally adequate. *	14 <i>"but 9 of them say the practice is inadequate."</i>	11 <i>"especially practical training is insufficient."</i>
	4. I think/do not think that there is good cooperation and communication between teaching staff and students at the school.	12 <i>"there is the communication at the level it should be, our questions are not left unanswered"</i>	7 <i>"lack of physical space and materials, lack of communication, lack of activities"</i>
	5. I think/do not think that the approach of the lecturers/educators towards the nursing profession is positive.	19 <i>"they value the profession, it sets a good example for us, it is a structure that values students, there is encouragement for the profession, they love their profession, it is very good, they emphasize that our profession is very important, they adopt professional approaches"</i>	-
	6. I feel/do not feel that I am a part of the school during the education I receive at the school.	11 <i>"I love my teachers, I love my friends"</i>	8 <i>"Since we coincide with the online education process, there is no joint work"</i>
	7. I think/do not think that the rules and regulations at school are applied fairly to everyone.	17 <i>"rules and expectations are explained in advance, I have not encountered any negative situation"</i>	2 <i>"even if I apply for something I need, it is not accepted"</i>

Table 3. Students' Opinions on the Hidden Curriculum (Continued)

Subheadings	Items	Students' opinions and frequency	
		I think	I do not think
Professional attainments	8. I think/do not think that the attitudes and behaviors of the lecturers are good role models for us.	17 <i>"their professional competence, professional approach and love for the profession make them role models."</i>	2 <i>"in general, there is an oppressive side to their behavior, there is a lesson-oriented approach"</i>
	9. I think/do not think that I have learned to respect the values, beliefs and opinions of people (patients, relatives, other health personnel, etc.) and to communicate well with them during my education at school.	18 <i>"the education I received at school and interacting with different people increased my communication skills and empathy."</i>	1 <i>"I learned from the social environment, not from the education I received at school."</i>
	10. I think/do not think that I have learned that professional ethical principles are important in nursing practice.	18 <i>"this profession is very sensitive, human health is at stake, health is a very serious field, our work is with people, it is part of our education"</i>	1 <i>"This is neglected in clinical settings"</i>
	11. I think/do not think that nursing is a valuable and valid profession in society.	14 <i>"because health is a priority and a necessity for everyone, and the nurse has an important position in the protection and promotion of health"</i>	5 <i>"because I think that the society is not aware of professional obligations and responsibilities, there is a negative evaluation from the environment, our social image is unfortunately still not at the desired levels"</i>
Student-teacher-school interaction	12. I think/do not think that there is gender discrimination in school/clinical practices.	3 <i>"nurses are more lenient towards male students in clinical practice"</i>	16 <i>"because there is an individual-oriented approach, I have never seen such a practice"</i>
	13. I think/do not think that lecturers are more understanding and polite to students they find close to themselves.	7 <i>"some of our teachers favor students, they talk to them more actively, those who like to attract attention and show their knowledge have always been more popular"</i>	12 <i>"their approach is the same towards everyone, I have never seen such an attitude"</i>
	14. I think/do not think that there is an oppressive attitude at school.	3 <i>"our ideas are not listened to, different behaviors are not accepted"</i>	15 <i>"there are only rules to follow, there is a calm and understanding educational environment"</i>

*Multiple responses were received.

DISCUSSION

This study was conducted to reveal how students evaluate the hidden curriculum in nursing education. The nursing students who participated in the study stated that the hidden curriculum in their faculties met the compliance of the formal programs and the desired characteristics in learning at above a moderate level. In educational environments, it is stated that the hidden curriculum of the institution and the educational programs should be compatible and at a high level. The high level of this compatibility is a positive factor affecting the professional competence of students.^{4,18,20,27} In this study, the fact that the hidden curriculum in the faculties of the students was

not found to be at a high level suggests that there are areas that need to be improved in the compatibility of the hidden curriculum with the education programs in faculties. The students' negative answers to the questions related to school climate such as physical structure and inadequacy of clinical practice may have caused students not to perceive the hidden curriculum at a high level. Besides, the fact that the majority of the students in the study stated that they had no knowledge about the hidden curriculum supports this situation. It can be said that students who have knowledge about the hidden curriculum have more positive perceptions of the hidden curriculum.^{10,14,28} Similar studies have indicated that nursing students'

perceptions of the hidden curriculum are at a moderate level^{29,30} or above a moderate level.²⁸

The quality of education received in faculties that are responsible for training professional nurses is a factor that directly affects both the professional satisfaction of nurse candidates and the quality of health services. Therefore, if institutions purposes to improve the quality of its graduates, it should be able to reveal and improve the hidden curriculum of the institution and the factors (such as faculty members' attitude, student interaction, educational environment, institutional culture, academic support) affecting it.² Similarly, the nursing students who participated in the study stated the hidden curriculum in their faculties it was determined that school climate was met at a moderate level, while professional attainments and student-teacher-school interaction were met at a higher level. The studies also show that nursing students score at a moderate and above a moderate level on the sub-dimensions of the scale.²⁸⁻³⁰ School climate is a concept that includes physical, social and academic dimensions.³¹ When the answers given by the students to the open-ended questions are analyzed, the majority of them mentioned the inadequacy of the physical structure and educational materials related to the school climate. It was also observed that students emphasized that the courses did not meet their personal development needs and that their practical training was insufficient. Almost half of the students stated that they did not feel like they were a part of the school due to the fact that their education processes in the last two years coincided with the pandemic (courses were conducted via distance education) and there were no joint activities. These results are important for students to adopt a positive school climate and develop a sense of belonging to their schools. Because, meeting on a common ground, taking responsibility, ensuring student participation and mutual interaction are important elements in the development of the sense of belonging.

There are different evaluations by a limited number of quantitative studies conducted with nursing students in the literature.^{5,29} This may be due to the differences in the socio-cultural structure of the faculties. Because, many variables such as the behaviors, approaches, beliefs, value judgments of educators and administrators, school climate, academic and social life, discipline and functioning of the school affect the hidden curriculum.^{4,5} Since these variables differ across universities, the hidden curriculum may vary according to each institution. It is natural to have these differences, the important thing is to help students, who will have a nursing profession, to graduate from their

faculties as professional nurses in accordance with their professional roles. In this context, revealing the hidden curriculum is important for improving professionalism.^{14,18} The majority of the students stated that they received ethical principles, which are important elements of professional acquisitions, at an adequate level during the education process and that the educators exhibited professional attitude. It is thought that the role model behaviors of the educators in the adoption of professional achievements positively affect the professional achievements of the students. Although most of the students considered the education and professional acquisitions they received at school to be sufficient, they stated that they felt inadequate especially in clinical practice and that they did not have the chance to observe the subjects taught theoretically or apply them in the laboratory. It is thought that this result may be related to the fact that especially 2nd, 3rd, and 4th grade students could not participate in clinical practices for sufficient time due to the pandemic.

It is known that the hidden curriculum is as effective as the planned program in the formation of professional characteristics. Joynt et al.³² highlighted a discrepancy between the knowledge imparted by the formal curriculum

and the perceptions shaped by the hidden curriculum. They suggested that strategies should be developed to effectively manage the hidden curriculum.³² Therefore, the nursing education process should be considered as a whole and should not only focus on a planned formal program. In this study, most of the students stated that the education they received at school increased their communication and empathy skills, and that ethical principles are a part of nursing education. However, one student reported that ethical principles were neglected in clinics. It is stated that professional values learned at school may change under the influence of many factors in professional life.²² In this study, the hidden curriculum was evaluated only on a school basis. However, clinical observations and the behaviors of health professionals whom they identify as role models are also important in the formation of students' professional values.^{21,33} If theoretical knowledge is not clearly reflected in clinical practice, this creates an incompatibility between what is taught and what is observed, which may negatively affect the professional preparation of nursing students.^{21,34}

In this study, it was found that female students' perceptions of hidden curriculum in the total scale score and in the sub-dimensions of school climate and professional achievements were significantly higher than

male students. In a study in the literature, it was reported that female students' perceptions of only professional gains were higher than male students.²⁹ Another study found that there was a relationship between both the total scale score and the student-teacher-school interaction sub-dimension and gender.²⁸ Studies in the literature showing that male students have lower professional attitudes and behaviors^{25,35,36} support the results of this study. The patriarchal structure of the society, the social perception that nursing is a female profession³⁷ and the majority of the educators being women may have affected male students' perceptions of professionalism. In particular, the fact that the hidden curriculum is effective in the development of moral and ethical values,^{11,38} suggests that this result is a finding that educators should take precautions.

The study found that students aged 18-19 had significantly higher total scale scores and perceptions of the hidden curriculum in the school climate sub-dimension compared to other age groups. This suggests that younger nursing students, particularly those aged 18-19, tend to have a more positive perception of the hidden curriculum. The limited educational experiences of younger students may indicate that they possess a less critical perspective. Additionally, differences in sample sizes between the groups may also influence this situation.

According to the total scale and the sub-dimensions of school climate and student-teacher-school interaction, 1st grade students' perceptions of hidden curriculum were significantly higher than 4th grade students' perceptions of hidden curriculum. This situation can be interpreted as the 1st grade students' perceptions of the hidden curriculum were more positive. Orgun et al.⁵, unlike the results of this study, found that 4th grade nursing students' perceptions of hidden curriculum were higher.⁵ In fact, the literature suggests that the perception of school climate may become more positive as students become accustomed to the school and its culture.²⁹ The effect of this difference may have been due to the fact that at the time of the study, students received their education through distance education under pandemic conditions. As a result, during the pandemic, students were away from their faculties, school climate and educator interaction. In addition, nursing education is carried out in both classroom and clinical settings. Students may be influenced by the faculty members, nurses who support clinical education, administrators and student nurses whom they take as role models,^{4,33} during their education. These effects may be positive or negative on their professional behaviors, attitudes in professional practices, perceptions of the profession and professional socialization.^{2,6,10,18,19} For this reason, the influence of the culture of the environment in

which students are trained in the clinic is also important, besides the influence of the faculty lecturers they take courses from. The majority of the students stated that the professional competencies, professional approaches and love for the profession of the lecturers were effective in making them role models. Students are more inclined to learn by modeling what they experience or observe from their educators. In general, this is a very effective learning method, but a concern arises when the modeled actions run counter to the intended learning goals and negatively impact students' development.¹² Sharing the faculty cultures and expectations of the educators in cooperation with the administration where students conduct practice and reinforcing this interaction with planned trainings can be significantly effective for nursing students. Understanding the importance and effects of the hidden curriculum by educators is of great importance in terms of structuring and supporting learning-teaching processes and controlling the elements that may cause negative inputs for students.³⁹

In this study, it was determined that there was a significant difference in the school climate sub-dimension with respect to the academic achievement variable. It is observed that the school climate perception of the students who evaluate their academic achievement as poor is lower than the students who evaluate their academic achievement as good and excellent. School climate is an important concept that affects students' learning levels as well as their social and emotional development. The necessary rules, values and exemplary behaviors for students to be successful are transferred to students through the hidden curriculum.^{21,27,40} In the literature, it was found that there was a significant positive relationship between school climate and academic achievement.^{29,41,42} Accordingly, it can be said that students who evaluate their academic achievement as poor have more negative perceptions of hidden curriculum. In addition, students who perceive the school climate as good have a positive sense of belonging to the school⁴³. Students' sense of belonging to the school can encourage them to perform at their maximum to achieve the desired academic performance.⁴⁴

The total scale, school climate, and professional attainments sub-dimensions score of the students who chose the nursing profession willingly were found to be significantly higher than the students who chose the nursing profession by chance and suggestion. While Kıskaç et al.²⁸, Yanmış and Özcan²⁹ and obtained similar findings in their studies, Şimşek et al.³⁰ found no relationship in their research.²⁸⁻³⁰ Choosing a profession willingly may have an impact on the student's awareness of the profession and its

values, and on the development of a sense of belonging to the school. Min et al.⁴⁵ found that students' satisfaction levels have an impact on their professional attitudes.⁴⁵ As a result, it is expected that a student with a positive attitude about his/her profession would also have positive perceptions about the educational institution⁵. In this study, it was observed that while the majority of the students expressed nursing as a valuable and valid profession, some of them stated that the society was not aware of professional obligations and responsibilities, that the environment had negative evaluations, and that its social image was still not at the desired level. It could be said that the university where the study was implemented has cultural diversity because it is located in a central location and has students from many different regions. This result is thought to be due to the cultural differences of the students.

Limitations

Nursing education is a process that takes place in classroom and clinical settings. Students gain ethical competence and form their professional identity by observing knowledge, socialization and model behavior in educational environments. In this context, the content of the hidden curriculum should be evaluated according to all groups such as peers, educators, clinical nurses in the clinical settings where the education takes place, with whom the student interacts throughout nursing education. One of the limitations of the study is that the evaluation was made only at the school level and according to the perceptions of the students. The second limitation of the study is that it is limited by nursing students in one institution, hence it includes the opinions of nursing students in only one university.

As a result of the study, it was found that nursing students' general and school climate perceptions of the hidden curriculum of their faculties were at a moderate to above moderate level, while their perceptions of professional attainments and student-teacher-school interaction were at higher level. This result shows that the hidden curriculum of the faculty is compatible with the formal curriculum and is effective at an above-average in providing students with the desired characteristics. It was also concluded that being female, the younger, choosing the profession willingly, being in the first grade, and awareness of the hidden curriculum increased the perception of the hidden curriculum.

If an institution providing nursing education purposes to improve the quality of its graduates, it should be able to reveal and improve the hidden curriculum of the institution

and the factors affecting it.² It is crucial that institutions and educators harness the potential of the hidden curriculum to positively influence students' professional identity development and patient care. In this context, it is recommended that institutions and educators be aware of their own hidden curricula and pay attention to the role of the hidden curriculum in the formation of professional values, norms and behaviors. Besides, the fact that the hidden curriculum differs according to gender, age and career preferences shows that more research is needed in these areas.

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Hakem Değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir- STK, TAS; Tasarım- STK, TAS; Denetleme- STK, TAS; Kaynaklar- STK, TAS; Veri Toplanması ve/veya İşlemesi- STK, TAS; Analiz ve/veya Yorum- STK, TAS; Literatür Taraması- STK, TAS; Yazıyı Yazan- STK, TAS; Eleştirel İnceleme- STK, TAS; Diğer- NA.

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360-Degree Evaluation of Educational Skills of Senior Nursing Students: A Retrospective Study

Son Sınıf Hemşirelik Öğrencilerinin Eğitim Becerilerinin 360 Derece Değerlendirilmesi: Retrospektif Bir Çalışma

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ABSTRACT

Objective: To assess the educational skills of senior nursing students using the 360-degree evaluation method.

Methods: This study retrospectively analyzed the scores of senior nursing students (n = 205) in terms of their educational skill evaluation by the instructor, preceptor, self, and peers. Data were collected retrospectively from the archived student files of the course between August 2022 and October 2022. SPSS for Windows v. 22.0 was used for statistical analysis. $P<.05$ was accepted as the statistical significance level.

Results: Of the students, 90.7% (n=186) were female, and 9.3% (n=19) were male. The mean and standard deviation scores on the education skills evaluation form were found to be 92.88 ± 7.65 for instructor evaluation, 94.67 ± 7.56 for preceptor evaluation, 96.38 ± 10.23 for self-evaluation, and 97.57 ± 8.60 for peer-evaluation. There was a positive and weakly significant correlation between instructor and preceptor evaluations ($r=.352$; $P<.001$), but instructor evaluation did not have a significant correlation with self-evaluation or peer-evaluation ($P>.05$). A positive and moderately significant correlation was observed between self-evaluation and peer-evaluation ($r=.634$; $P<.001$).

Conclusion: The students tend to give higher scores in self-evaluation and peer-evaluation. Therefore, it is recommended that evaluators adhere to established rules and undergo proper training to prevent a lack of agreement in evaluation among raters and ensure a consistent assessment.

Keywords: Educational measurement, clinical competence, nursing education, nursing education research

ÖZ

Amaç: Bu araştırmada, son sınıf hemşirelik öğrencilerinin eğitim becerilerinin 360 derece değerlendirme yöntemi kullanılarak incelenmesi amaçlanmıştır.

Yöntemler: Bu çalışmada, hemşirelik son sınıf öğrencilerinin (n = 205) öğretim elemanı, klinik rehber, kendi ve akranları tarafından eğitim becerileri değerlendirme puanları retrospektif olarak analiz edilmiştir. Veriler, Ağustos 2022 ve Ekim 2022 tarihleri arasında dersin arşivlenmiş öğrenci dosyalarından retrospektif olarak toplanmıştır. İstatistiksel analiz için SPSS for Windows v. 22.0 kullanıldı. İstatistiksel anlamlılık düzeyi olarak $P<.05$ kabul edildi.

Bulgular: Öğrencilerin %90,7'si (n=186) kız, %9,3'ü (n=19) erkektir. Eğitim becerileri değerlendirme formundaki ortalama ve standart sapma puanları; öğretim elemanı değerlendirmesi için $92,88 \pm 7,65$, klinik rehber değerlendirmesi için $94,67 \pm 7,56$, öz değerlendirme için $96,38 \pm 10,23$ ve akran değerlendirmesi için $97,57 \pm 8,60$ olarak bulunmuştur. Öğretim elemanı ve klinik rehber değerlendirmeleri arasında pozitif ve zayıf düzeyde anlamlı bir korelasyon mevcuttu ($r=.352$; $P<.001$), ancak öğretim elemanı değerlendirmesinin öz değerlendirme veya akran değerlendirmesi ile anlamlı bir ilişkisi yoktu ($P>.05$). Öz değerlendirme ile akran değerlendirmesi arasında pozitif yönde orta düzeyde anlamlı bir ilişki olduğu görüldü ($r=.634$; $P<.001$).

Sonuç: Öğrenciler öz değerlendirme ve akran değerlendirmesinde daha yüksek puanlar verme eğilimindedir. Bu nedenle, değerlendiriciler arasında değerlendirme konusunda fikir birliği eksikliğini önlemek ve tutarlı bir değerlendirme sağlamak için değerlendiricilerin belirlenmiş kurallara uymaları ve uygun eğitimden geçmeleri önerilir.

Anahtar Kelimeler: Eğitimsel ölçüm, klinik yeterlilik, hemşirelik eğitimi, hemşirelik eğitimi araştırması



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INTRODUCTION

Nursing is a knowledge-based and competency-oriented profession with a dynamic structure to meet the changing health needs of society. The presence of nurses with professional competence is crucial in the context of developing and evolving health service delivery.¹ Nursing education programs are designed and updated to enable students to acquire these competences. In this direction, there is a need for student-centered, standardized, and interdisciplinary evaluation methods.^{2–6} For this purpose, one of the current approaches used in the evaluation of clinical teaching is “360-degree evaluation”, which is also referred to as “360-degree feedback”, “multi-source survey”, and “multi-source rater feedback”.⁷

The 360-degree evaluation is a comprehensive evaluation approach that involves multiple stakeholders in the evaluation process of a student’s clinical teaching, including the students themselves, healthcare professionals, peers, and occasionally those who observe the student during clinical practice, such as patients and their relatives.⁷ This method pertains to the assessment of an individual’s performance by key personnel in the professional environment. In this process, feedback about the individual is collected and communicated to the individual, with the primary goals being the identification of strengths and areas for growth, ultimately leading to enhanced performance.⁸ This allows the learner or individual to gain insight into performance from various perspectives. The strategy of offering complete feedback is valued by students, and the inclusion of self-evaluation enhances students’ learning experience and personal growth.⁹ The involvement of other care team members in the evaluation process serves to promote and foster students’ active engagement in teamwork and shared leadership. Peer evaluation, on the other hand, empowers students to assume responsibility for actively participating in their own learning processes and engaging in collaborative learning. Patient involvement provides a focus on the patient-centered philosophy of care.¹⁰ The feedback from patients can significantly contribute to the improvement of health services.¹¹

The 360-degree evaluation method allows for comprehensive evaluation of students, providing a holistic view of their progress in knowledge, skills, behavior, and attitudes. It facilitates the development of students from a novice level to a state of competency.⁹ The utilization of this evaluation method has become a prevalent approach to assessing professional processes and clinical skills. This approach has the potential to be implemented in the

educational practices of future nurses and is recommended to be integrated into nursing education.^{9,10,12–14}

The 360-degree evaluation is an innovative, motivating, and comprehensive approach to the acquisition of excellence-oriented competencies.¹⁰ In a systematic review, Bayzat and Sarmasoğlu Kılıkçier⁷ determined that the communication skills of medical and nursing students were evaluated most frequently (65.2%) with the 360-degree evaluation.⁷ Other researchers conducted with different evaluator groups have investigated the use of the 360-degree evaluation method in various areas, including the assessment of the leadership skills of delivery room nurses¹⁴, the professionalism and clinical skills of nursing students¹⁵, the clinical judgment/ability of graduate advanced practice nursing students⁹, basic competencies of post-graduate residents¹¹, and clinical ethics in hospitals.¹⁶

The 360-degree evaluation method can be an extremely effective tool in nursing education, considering that students often differ in their communication in the presence of an educator and when communicating independently with their peers, healthcare professionals, and patients.¹⁷ In this context, evaluations from different perspectives have the potential to enhance the accuracy of scores and mitigate the frequency of student complaints, as opposed to relying solely on the subjective judgment of educators.¹⁵ Furthermore, the presence of different evaluators facilitates introspection on one’s own practices, hence fostering the learning process and the growth of the learner in this direction¹⁸, and positive changes can be observed in attitudes and behaviors through this process.¹⁹

The 360-degree evaluation method is widely recognized as a valuable formative assessment tool for facilitating assessment for learning²⁰; however, it is accompanied by many challenges.^{20–22} Several negative aspects can be observed, including a lack of agreement among evaluators^{15,23}, logistical challenges that hinder the model’s optimal functioning, and attitudinal barriers, such as the lack of an evaluation culture.²⁴ Therefore, the successful implementation of this method requires a planned approach with the comprehensive support of faculty members.²⁰

Although studies on the use of 360-degree evaluation in clinical teaching have increased in recent years, there is a scarcity of studies specifically investigating nursing students.^{7,14,15} This evaluation method has been utilized in the evaluation of patient presentation skills in pharmacy.²⁵ However, no study has been found that examined students’ education skills in nursing education from the perspective

of evaluation. Therefore, further research is required in this particular area.

AIM

The current study aimed to examine the educational skills of senior nursing students using the 360-degree evaluation method.

Research questions

The research questions were as follows:

- What is the mean educational skill evaluation score of senior nursing students from each evaluator group?
- Is there a statistically significant correlation between the mean educational skill evaluation scores of senior nursing students, as assessed by different groups of evaluators?

METHODS

This study retrospectively analyzed the scores of senior nursing students ($n = 205$) in terms of their educational skill evaluation by the instructor, preceptor, self, and peers.

Sample

The research population comprised senior nursing students ($n = 279$) enrolled in a Faculty of Nursing during the 2021-2022 academic year. The sample ($n = 205$) consisted of data from students whose forms were entirely completed by four evaluators. Four evaluation forms were used to conduct a comprehensive 360-degree evaluation for every student. In total, 820 (205×4) evaluation forms were analyzed.

Data collection

The Education Skills Evaluation Form (ESEF), which was prepared by the responsible teaching staff of the course in light of the literature²⁶⁻²⁸, received the opinions of seven experts and was content validated, was used to evaluate the training given by the students in the clinical setting. The ESEF a three-point rating scale (sufficient, 4 points; partially sufficient, 2 points; and unsatisfactory, 0 points) and consists of 25 items that assess presentation skills such as gaining attention at the beginning of the training, keeping the learner active during the training, giving feedback, evaluating at the end of the training and using effective presentation techniques. The lowest score that can be obtained from the scale is 0, and the highest score is 100. The clinical training of the senior nursing students was assessed at the same time by four evaluators through the utilization of the ESEF during a presentation, and the scores of students on this form were analyzed.

The course instructors introduced the ESEF to the nurse counsellors at the beginning of the academic year and to the students before they started clinical practice and

trained them on how to evaluate the form. The evaluator lecturers were experts in the field of teaching in nursing who were trained in this field. Data were collected retrospectively from the archived student files of the course between August 2022 and October 2022. The results of the ESEF, which was evaluated separately by the preceptor, the instructor, himself/herself and the peer evaluator during the clinical education of each student, were analysed.

Data analysis

SPSS version 22.0 (IBM Corp., Armonk, NY, USA) was used for data analysis. Descriptive statistics, including numbers, percentages, mean, and standard deviation values, were obtained. Since the data did not show a normal distribution according to the Kolmogorov-Smirnov test, Spearman correlation analysis was undertaken. $P < .05$ was accepted as the statistical significance level.

Ethical considerations

Ethical approval for this study was obtained from the Scientific Research and Publication Ethics Committee of Ege University (Protocol number: 1662, date: October 27, 2022). In order to use the data, permission was obtained from the institution (Date: 08.12.2022, Number: E.976708).

RESULTS

Of the students, 90.7% ($n = 186$) were female, and 9.3% ($n = 19$) were male. The mean and standard deviation values of the mean educational skills scores of the students were determined to be 92.88 ± 7.65 for instructor evaluation, 94.67 ± 7.56 for preceptor evaluation, 96.38 ± 10.23 for self-evaluation, and 97.57 ± 8.60 for peer evaluation. The mean educational skills scores of all evaluators were 95.37 ± 5.82 (Table 1). The highest mean score was obtained from peer evaluation, followed by self-evaluation and preceptor evaluation, and the lowest from instructor evaluation.

Table 1. Mean educational skills scores of senior nursing students ($n = 205$), as assessed by the instructor, preceptor, self, and peers

Evaluator	Min	Max	X $\pm$ SD
Instructor	40	100	92.88 ± 7.65
Preceptor	60	100	94.67 ± 7.56
Self	50	100	96.38 ± 10.23
Peer	50	100	97.57 ± 8.60
Mean score	63	100	95.37 ± 5.82

Min: Minimum; Max: Maximum; X $\pm$ SD: Mean $\pm$ Standard deviation

Upon analyzing the correlation between the evaluators, it was determined that there was a positive and weak-level correlation between instructor evaluation and preceptor evaluation ($r=.352$; $P<.001$) and a positive and very weak-

level correlation between preceptor evaluation and peer evaluation ($r=.142$; $P=.043$). Instructor evaluation did not have a significant correlation with self-evaluation or peer evaluation ($P > .05$). A positive and moderately significant correlation was found between self-evaluation and peer evaluation ($r=.634$; $P<.001$). In addition, the mean educational skills scores of the students had a positive and high-level correlation with instructor evaluation ($r=.712$;

$P<.001$) and a positive and moderately significant correlation with preceptor evaluation ($r=.691$; $P<.001$), self-evaluation ($r=.449$; $P<.001$), and peer evaluation ($r=.465$; $P<.001$) ($P < .05$). Among the evaluators, the highest level of correlation was observed between the self and peers, followed by between the instructor and preceptor (Table 2).

Table 2. Correlation between the educational skills scores of senior nursing students (n = 205), as assessed by different evaluators

Evaluator	Instructor evaluation	Preceptor evaluation	Self-evaluation	Peer evaluation	Mean score of all evaluators
Instructor	$r = 1$	$r = .352$ $P<.001^*$	$r = .111$ $P = .115$	$r = .125$ $P = .073$	$r = .712$ $P<.001^*$
Preceptor		$r = 1$	$r = .053$ $P = .449$	$r = .142$ $P = .043^*$	$r = .691$ $P<.001^*$
Self			$r = 1$	$r = .634$ $P<.001^*$	$r = .449$ $P<.001^*$
Peer				$r = 1$	$r = .465$ $P<.001^*$
Mean score of all					$r = 1$

* $P < .05$; r : Spearman correlation coefficient

DISCUSSION

The 360-degree evaluation method involves the evaluation of skills or competences by more than one evaluator. This study aimed to assess the educational skills of senior nursing students through self-evaluation, peer evaluation, preceptor evaluation, and instructor evaluation. The systematic review conducted by Bayzat and Sarmasoğlu Kılıkçier⁷ revealed that nurses served as evaluators in 95.6% ($n = 22$) of the studies. Apart from these, there are studies in which standardized patients⁹, other healthcare team members¹⁴, and patient relatives¹⁵ performed this evaluation. It has been stated that this method provides faculty members with a comprehensive assessment of students and critical data.⁹ In a study by González-Gil et al.¹⁰, students stated that self-evaluation held the paramount importance among multi-source assessments since it facilitated critical reflection on one's own performance, enabling individuals to identify areas of improvement and strategize potential modifications. In addition, it has been suggested that receiving feedback from colleagues is highly motivating¹⁰ and that peer evaluation is a useful pedagogical strategy in providing formative feedback in teaching students the essential skills of patient presentation.²⁵ In this study, the fact that four different evaluators carried out evaluations at the same time is a strength of the study. In addition, the evaluators are similar to those found in the studies in the literature.

In this study, the students obtained the highest mean educational skills scores from peer evaluation, followed by self-evaluation and preceptor evaluation, and the lowest from instructor evaluation. Upon reviewing the existing literature, it has been ascertained that the students attained the highest scores from evaluations conducted by their peers^{21,29}, and while the nurses gave the students relatively high scores, the instructors provided the lowest scores.^{15,30} In another study, it was found that self-evaluation yielded the highest total mean scores in the assessment of clinical skills, and this was followed by peer evaluation and subsequently clinical instructor evaluation.²⁹ In this context, it is consistent with the literature that there were inter-rater differences in this study and that students tended to give more points to themselves and their peers. In addition, the instructors' scores had the lowest mean of the four evaluators, similar to the literature. The meticulous evaluation of the instructors may be due to the importance of training competent nurses.³¹

In this study, it is seen that the highest level of correlation among the students' educational skills scores was between self-evaluation and peer evaluation, followed by instructor and preceptor evaluations. However, no significant relationship was found between instructor evaluation and self-evaluation or peer evaluation. Hemalatha and Shakuntala¹⁷ also reported that different evaluators made

different evaluations, and there was no correlation between certain evaluators.¹⁷ In another study, a significant, positive correlation was found between patient relative evaluation and self-evaluation, and there was a non-significant correlation between nurse and instructor evaluations.¹⁵ Similar to the literature, in the current study, a lack of agreement was detected among the evaluators. While instructors have difficulties using this method, it also provides an approach that offers a fair, consistent, more realistic, and objective assessment of clinical competence for students.^{9,32} In the literature, it has been stated that the instructors' lower evaluation scores when compared to other evaluators can be attributed to their more careful and meticulous observations.¹⁵ Furthermore, one possible explanation for this discrepancy or difference in scores may be the tendency of students to exhibit generosity while assessing both themselves and their peers. A study by Rahimi et al.³⁰ highlighted the importance of combining different perspectives to achieve a more comprehensive and balanced assessment, as perspectives between students and instructors could affect assessment outcomes.

The use of the 360-degree assessment method can be used as a comprehensive, appropriate and effective method for clinical courses as it positively encourages students' clinical performance self-efficacy.³¹ Given the observed variations in ratings across evaluators, self-evaluation and peer evaluation can be used as complementary methods to the evaluation of instructors in measuring the clinical performance of students.²⁹ This method is recommended for use with nursing students as it can lead to improvements in the quality of patient care and contribute to better outcomes in both education and patient care.³⁰ Berk³³ also emphasized the need for clear, understandable, meaningful, and appropriate guidelines for the rating of instructors and administrators in order to interpret the results in an accurate, fair, and equitable manner and to provide sensitive and appropriate feedback. In the current study, all evaluators were informed about the evaluation, completed the evaluation at the same time using the same form and rated the training skills they observed. In this context, it is thought that this evaluation method can play an important role in ensuring equal and fair assessment.

Limitations

One of the limitations of this study concerns its retrospective design, which restricted the examination of data pertaining to the entire population under investigation. Nevertheless, the sample size was large, and a comprehensive review of existing literature has not yielded any prior research examining the evaluation of student nurses' educational competencies through the

360-degree evaluation method. Lastly, the data of the study being limited to one nursing faculty resulted in a limitation concerning the generalization of the findings obtained.

In this study, a multi-source evaluation of nursing students' educational skills was undertaken using the 360-degree evaluation method. It is important to afford students the opportunity to participate in the evaluation process, as doing so can enhance their engagement, motivation, performance, and academic achievement within the instructional setting. In this context, the 360-degree evaluation approach can be integrated into nursing education programs to allow for the evaluation of many competencies, including teamwork, communication, and problem-solving, by different evaluators, such as patients, other healthcare professionals, and standardized patients. However, since the students tend to give higher scores in self-evaluation and peer evaluation, it is recommended that evaluators adhere to established rules and undergo proper training to prevent a lack of agreement in evaluation among raters and ensure a consistent assessment. Furthermore, it is advisable to conduct empirical studies that employ the 360-degree evaluation approach as a formative assessment tool, followed by the observation of subsequent modifications in students' skills.

Etik Komite Onayı: Etik kurul onayı Ege Üniversitesi Bilimsel Araştırma ve Yayın Etiği Kurulu'ndan (Tarih: 27.10.2022, Sayı: 1662) alınmıştır.

Bilgilendirilmiş Onam: Çalışmanın retrospektif tasarımı nedeniyle veriler daha önceden kaydedilmiş olduğu için katılımcı onamı alınamamıştır. Tüm veriler gizlilik ve anonimlik ilkelerine uygun olarak analiz edilmiştir.

Hakem Değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir- FO, NÖ, GÇ, CPA, YT; Tasarım- FO, NÖ, GÇ, CPA, YT; Denetleme- İD; Kaynaklar-; Veri Toplanması ve/veya İşlemesi- FO, NÖ, GÇ, CPA, YT; Analiz ve/veya Yorum- GÇ, CPA, YT; Literatür Taraması- GÇ, CPA; Yazıyı Yazan- FO, NÖ, GÇ, CPA; Eleştirel İnceleme FO, NÖ, YT

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Ethics Committee Approval: Ethics committee approval was obtained from the Scientific Research and Publication Ethics Committee of Ege University (Date: 27.10.2022, Number:1662) **Informed Consent:** Due to the retrospective design of the study, participant consent could not be obtained because the data had already been recorded. All data were analysed in accordance with the principles of confidentiality and anonymity.

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Nursing Students' Learning Experiences About the Nursing Process in Laboratory and Clinical Practice: A Qualitative Study

Hemşirelik Öğrencilerinin Laboratuvar ve Klinik Uygulamada Hemşirelik Süreci Hakkında Öğrenme Deneyimleri: Nitel Bir Çalışma

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ABSTRACT

Objective: The aim of this study was to analyze nursing students' learning experiences the nursing process in laboratory and clinical practice.

Methods: The study design was a descriptive qualitative approach. The population of the study consisted of 450 students studying at the faculty of nursing. Data were collected by using the focus group interview from 30 students. Focus group interviews were conducted between 01-20 September 2018. The data were analyzed by using thematic analysis. The transcription and analysis of the data were done by the researchers and no analysis program was used.

Results: Three themes were emerged: 1) Nursing process as clinical and professional guide 2) Step by step permanent learning 3) Mentoring need. Although the students understand the importance of the nursing process, they encountered difficulties during the learning related to the educator's attitude, learning opportunity, and lack of professional competency level.

Conclusion: In this study, for the nursing student, the nursing process is a successful method in developing a holistic perspective to students; however, there are important obstacles in its implementation. It is recommended that nursing process teaching should be carried out mainly in clinical practice under the guidance of the educators at the bedside.

Keywords: Nursing process, education, nursing, care planning, nursing student

ÖZ

Amaç: Bu çalışmanın amacı hemşirelik öğrencilerinin laboratuvar ve klinik uygulamada hemşirelik süreci hakkında öğrenme deneyimlerini analiz etmektir.

Yöntemler: Çalışma tasarımı tanımlayıcı nitel bir yaklaşımdır. Çalışmanın evreni hemşirelik fakültesinde öğrenim gören 450 öğrenciden oluşmaktadır. Veriler 30 öğrenciden odak grup görüşmesi kullanılarak toplanmıştır. Odak grup görüşmeleri 01-20 Eylül 2018 tarihleri arasında gerçekleştirilmiştir. Veriler tematik analiz kullanılarak analiz edilmiştir. Verilerin transkripsiyonu ve analizi araştırmacılar tarafından yapılmış olup herhangi bir analiz programı kullanılmamıştır.

Bulgular: Üç tema ortaya çıkmıştır: 1) Klinik ve profesyonel rehber olarak hemşirelik süreci 2) Adım adım kalıcı öğrenme 3) Mentorluk ihtiyacı. Öğrenciler hemşirelik sürecinin önemini anlasalar da eğitimcinin tutumu, öğrenme fırsatı ve mesleki yeterlilik düzeyinin eksikliği ile ilgili olarak öğrenme sırasında zorluklarla karşılaşmışlardır.

Sonuç: Bu çalışmada, hemşirelik öğrencisi için hemşirelik süreci öğrencilere bütünsel bir bakış açısı geliştirmede başarılı bir yöntemdir; ancak uygulanmasında önemli engeller vardır. Hemşirelik süreci öğretiminin esas olarak klinik uygulamada, yatak başında eğitimcilerin rehberliğinde gerçekleştirilmesi önerilir.

Anahtar Kelimeler: Hemşirelik süreci, eğitim, bakım planlaması, hemşirelik öğrencisi

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INTRODUCTION

The nursing process is an individual-oriented, dynamic and universally applicable care model. When applying the nursing process, high-level critical thinking and analysis skills are required at each stage.^{1,2} The nursing process provides to integrate discipline-specific knowledge with clinical practices using multiple types of critical thinking and reasoning skills. The use of nursing process requires the ability to collect data, verify data, analyze data, interpret and evaluation by make judgments during the diagnostic inquiry phase. Similarly, at the stage of care planning, knowledge and skills are needed to set goals, set priorities, choose the right interventions, implement these interventions and evaluate their results. Studies reported that students have some difficulties with every stage. These difficulties include; 1) distinguishing the concepts of the nursing process; 2) collecting, analyzing, and synthesizing the patients' data; 3) communication problems with the patients; 4) integrating theory and practice.³⁻⁵ Nursing students mostly have difficulty formulating appropriate nursing diagnoses, prioritizing diagnoses, developing care objectives for diagnosis.⁶ It is critical for students to transfer the nursing process to clinical practice and to make the correct diagnosis and appropriate interventions.⁷ Considering the complexity of the nursing process, innovative strategies and intensive guidance in practice are needed to provide the student with the ability to independently diagnose and plan care.⁸

AIM

In this context, the research was conducted with the aim of analyzing the nursing students' experiences of learning the nursing process in laboratory and clinical practice.

METHODS

Study Design

This study was conducted with descriptive qualitative research design. The goal of qualitative descriptive studies is to provide a comprehensive summary regarding everyday events/conditions/situations.⁹

Study Setting

The study was conducted between between 01-20 September 2018 in Akdeniz University Faculty of Nursing. The total number of students in the first, second, third and fourth years of the Faculty of Nursing is 998. Theoretical and practical courses in the faculty are conducted as 4 hours of theory, 2-4 hours of laboratory and 8-10 hours of clinical practice per week. The Gordon Functional Health Models model and the North American Nursing Diagnostic Association-International (NANDA-I) classification system are used in the teaching of the Nursing Process in the

faculty. The teaching of the nursing process is carried out in the Fundamentals of Nursing Course in the first year; four hours of theoretical information in the classroom and 4 hours of practice in the laboratory. In the laboratory practice, a case study method is used with 10-12 students through a guidebook. 1. In the clinical practice of the course, the teaching of the assessment, nursing diagnosis, planning, implementation and evaluation stages of the nursing process is carried out by reinforcing it with the clinical condition of the patient at the bedside. This method in clinical practice is used in all other theoretical and practical courses in order to put the nursing process into practice.

Universe and Sample

The universe of the research consisted of 998 first, second, third and fourth year students at the faculty where the research was conducted. The participants were selected from the second, third and fourth year students of the faculty. First year students were excluded from the study because they had not yet taken the course. Participants were selected using purposeful sampling method.¹⁰ The inclusion criteria were (1) being voluntary, (2) having taken the nursing process and case discussion course and (3) having participated in laboratory and clinical practice. Selection of participants and data analysis continued until a saturation point was reached at which no new concept emerged from the data analysis.^{10,11} In this context, the research was carried out with the participation of 30 students in five focus groups by forming focus groups of six students. A focus group interview lasted approximately 60-90 minutes. Standards for Reporting Qualitative Research (SRQR) guideline was followed to guide the study and present the results.¹²

Data Collection

Data were collected between 01-20 September 2018. Focus group interview technique was selected for data collection due to the advantages they reveal how individuals feel about specific issues and phenomena. Focus groups enable the sharing of elaboration on and clarification of ideas.^{13,14} New ideas are produced by individuals with similar characteristics. The interactions and positive group dynamics enable rich data collection.¹⁵ Five focus group interviews were conducted to collect data. A focus group for second-year students (as data saturation was achieved with one group) and two focus groups each for third and fourth-year students were formed.¹³ For focus groups it is recommended that the size of the group include between six and 12 participants, so that the group is small enough for all members to talk and share their thoughts, and yet large enough to create a diverse group.¹¹ Focus group interviews were conducted by one moderator

and two assistant moderators. The moderator was a faculty member who was not involved in the second, third, and fourth year courses. Assistant moderators were researchers. The moderator informed the participants about the study and focus group interview method and obtained written consent from the participants. Interviews were conducted with semi-structured interview questions. "Focus group discussions were conducted in line with nine sub-questions under the following three main questions (Table 1): What would you say about the nursing process?; What would you say about teaching the nursing process?; What would you say about the implementation of the nursing process?"

Table 1. Questions for the focus group interview

What would you say about the nursing process?
• What are the basic qualities of the nursing process? • What would you say about the concepts of the nursing process?
What would you say about teaching the nursing process?
• What would you say about theoretical education? • What would you say about clinical education? • What would you say about teaching methods?
What would you say about the implementation of the nursing process?
• What do you think about the effects of the nursing process on patient care? • What do you think about the effects of the nursing process on your development process? • What do you think about the factors that affect the implementation of the nursing process? • What would you say about care plans?

Data analysis

Five focus group interviews were analyzed by qualitative content analysis, which is an interpretive, systematic process that focuses on the subject and context.¹⁵ The data in the voice recorder and the notes taken by the reporters were transcribed into the computer. The transcript has been read by all authors many times until it forms a sense of integrity. The pre-existing code system was not used, and inductive content analysis was preferred in this study.^{15,16} The transcripts were analyzed in five steps: (1) Familiarizing with the data: The researchers read the transcript independently in detail at the first meeting and compared meaningful sections from words, sentences, or paragraphs that relate to the context, (2) Generating initial codes: The researchers read and coded the transcripts independently, (3) Discussing the codes: The researchers re-read the paragraphs, sentences, and codes, (4) Reviewing the codes: There searchers reviewed the codes according to their similarities and differences, (5) Defining the names and themes: Codes were clustered and categorized by three researchers.¹⁵⁻¹⁷

Rigor and trustworthiness

The study's Rigor and trustworthiness was based on four criteria: credibility, dependability, confirmability, transferability.^{10,18,19} Rigor and trustworthiness were achieved through focus group interviews using a semi structured interview form to ensure that the participants were asked a similar question. The moderator and two assistant moderators had training in the qualitative research. To increase the transferability, purposeful sampling method was used to explore different experiences of students at their progression in the education program. Within the scope of credibility, the researcher was diversified to reveal different perspectives, different meanings, different indicators, and sources of study data. Focus group interviews were transcribed without comments. Each researcher read the transcribed text independently and performed independent coding. The researchers repeatedly read the data during the coding and criticized the suitability. Created themes were evaluated and compared with the raw data by a qualitative research expert.¹⁵

Ethical Dimension

The study was approved by the Ethics Committee of Akdeniz University (Decision Date: 07/09/2016, Decision No: 491). Written informed consent was obtained from participants before data collection. Sections of the study (data collection, storage and destruction of data...etc.) were conducted in accordance with the Principles of the Declaration of Helsinki.

RESULTS

The average age of the students participating in the research is 20.46 ± 1.22 years, half of them are women. 70% of the students are satisfied with their nursing education. The students' academic grade point average is 2.86 ± 0.39 .

Based on data analysis obtained with students' experiences, three themes emerged: 1) Nursing process as clinical and professional guide 2) Step by step permanent learning 3) Need mentoring. Although the students understood the importance of the nursing process, they stated that they encountered difficulties during learning related to the educator's attitude, learning opportunity and inadequacy of professional competence (Table 2).

Theme 1: Nursing process as clinical and professional guide

The students' views within the scope of this theme included that they could see the whole about the patient as a whole and had the opportunity to address the patient in all aspects.

Table 2. Themes and Sub-themes

Themes	Sub-themes
Nursing process as clinical and professional guide	Seeing the whole picture Like a real nurse
Step by step permanent learning	A case, lots of thought Bedside teaching
Need mentoring	Difficulty communicating with the patient Lack of guidance

Subtheme-1. Seeing the whole Picture: Most of the participants thought that the nursing process provided holistic perspective and systematic approach.

"The nursing process gives me a different perspective. When we care for the patients and witness how much pain they have, we realize in time that the care plan is not dependent on our preference. The more nursing diagnoses we determine, the more holistic and broad-focused we can assess the patient." (P25)

"When we practiced the nursing process, we realized how important even the shape of the bed and nightstand is. Because we learned to evaluate the patient as a whole with his/her environment. A small problem with its environment can sometimes be the main cause of the problem." (P4)

Subtheme-2. Like a real nurse: The participants stated that patients, patient relatives, and other health professionals respected the nursing students, as they provided holistic patient care. These students verbalized that individuals' attitudes made them feel like a real nurse.

"When we provide holistic patient care, we realize that nurses and physicians care about us more. They want to obtain information about the patient's clinical status because they know that we have deep knowledge of the patient's progress. I have seen that patients respect us more. Patients ask us questions that they could not ask physicians or nurses. This makes us feel like a real nurse." (P4)

"As you care for the patient, you see what is important to the patient. For example, sleep deprivation may be an unimportant diagnosis for someone else. However, the nurse recognizes the importance of the problem. We learn to think like a nurse by conscience and human love." (P3)

Theme 2: Step by step permanent learning

Students often expressed their satisfaction with the case discussions held for the purpose of teaching the nursing process in laboratory and clinical environment.

Subtheme-1. A case, lots of thought: The participants stated that case discussions provided the students to recognize

different thoughts and to realize the deficiencies and mistakes. Small group case discussions were defined as a method that effective and useful.

"We analyzed the same case in the laboratory one by one. I understand that a situation can have many different aspects. The solution is to change the window you are looking at... I think the discussion would be more beneficial and permanent if we increase such practices a little more." (P2)

One of the participants remarked that she felt free to make mistakes in case discussions. Therefore, she requested that case discussions should be increased as much as possible.

"Being with friends in a different environment than the hospital is comfortable. There are no real patients, and you are free to make a mistake. Just brainstorming... Learning methods, which are like the real clinical environment, but we are not afraid of making mistakes, should be increased. I can say that I learned how to assess the patient as a whole through case discussions." (P3)

Subtheme-2. Bedside learning: All participants expressed that they needed bedside teaching and the educator's expertise. The participants remarked that they discovered humanistic care through bedside teaching as an effective and permanent learning method.

"The educator should first assess and know the patient. Afterward, she should decide whether diagnoses are appropriate for the patient. We both must know and discuss the patients' clinical status. When this happens, it becomes instructive." (P17)

"It is difficult to do something said, it is easier to do something shown. I observe the behavior, communication skill and facial expressions of the educator. I try to define humanistic care. The educator should love the human and her profession and have expert knowledge. Otherwise, theory and practice do not integrate." (P7)

Theme 3: Need mentoring

Within the scope of this theme, the participants stated that they often had difficulties in patient communication and wanted their mentors to be with them.

Subtheme-1. Difficulty communicating with the patient: Most of the participants had difficulties in some processes that include patient assessment, data collection, and communication due to inexperience and lack of knowledge.

"I cannot collect any data about some patterns. I am afraid to ask questions to patients. I fill out some fields

only according to my observations. Like the reproductive system and sexuality... I refrain from talking about sexuality. I have never talked to anyone about sexuality. How can I ask a person about this pattern?" (P13)

"I have difficulty to collect data from the patient. I cannot initiate communication due to the patient's attitude. I am not able to care for the patient as I planned. I hesitate to touch the patient. The patients kept saying: Who are you? Where is the educator? Are you doing it right? I want a more experienced person to care for me." (P14)

Subtheme-2. Lack of guidance: All participants reported that they needed mentors guidance and feedback at every stage of the nursing process for personal development, but they do not receive enough.

"Educators don't question practices' accuracy because of did not observe the student while providing the care. They just interpret written notes and expressions on the care plans and do not tell the missing points. How can I improve myself if they don't tell the inadequacies?" (P19)

Participants felt confused and desperatedue to the diversity of educators' expectations about the care plan.

"In the first year, I thought that I learned the concepts of the nursing process correctly. I was able to accurately identify the etiological factors and descriptive criteria of the diagnosis. In the second year, I realized that the educators' expectations were different. There were several diagnoses to be determined for each patient. There was an obligation to determine at least 2 collaborative diagnoses for one patient. I was confused. We say that caring is individual, but can we talk about individualized nursing care in this case? (P27)

"Educators described the outcome criteria and aim statement differently in care planning. There was no common expectation. I was able to cope with desperation by writing different statements according to each educators' expectations." (P22)

DISCUSSION

Nursing process as clinical and professional guide

In the study, the students stated that the nursing process enabled them to get to know the individual as a whole and that they learned to give care in a systematic way with a formal model. Likewise, students in the other studies stated that the nursing process is very important in evaluating the patient in a holistic manner, systematic and organized presentation of care.²⁰⁻²² In a study conducted by Korkut et al.,⁷ students stated that the nursing process

provides multidisciplinary care, and when each step of it is performed correctly, it makes blind spots visible. On the other hand, in another study, the students perceived that the nursing process is a good guiding tool for nursing care which improves the quality of care. The students revealed that the use of the nursing process enables nurses to prioritise patients' needs and guide them when providing care to patients.²³ The nursing process allows nurses to consider the individual as a whole and to adopt an individual-centered systematic approach while giving care. Therefore, as a result of teaching the nursing process, it is very important for the student to benefit and adopt. In this context, it should be taken into account that understanding the steps of the nursing process and care plan depends on problem solving and critical thinking competence, and the methods of practice, discussion, feedback and clinical adaptation should be integrated into the training process.

In the study, it was determined that students received positive feedback from other disciplines and patients regarding their professional identity while working with the nursing process, and they felt like a nurse. Korkut et al.⁷ also stated in their study that students understand the roles of nursing while working with the nursing process, they are happy because they make a difference in the lives of patients, and they gain professional gains. However, in some study results, it is emphasized that students routinely perform the nursing process without internalizing it. In a qualitative study was conducted by Heidari and Hamooleh,²⁴ it was determined that employing the nursing process has increased students' dissatisfaction. In this study, authors were stated that most students stated that using the nursing process decreases the sense of dependence due to monotony, and this in turn causes routineness and finally results in a decrease of motivation and performance in nursing students.²⁴ In the other study, students stated that some patients prefer to be evaluated and taken care of by nurses rather than students, and this reduces both motivation and practice for students to learn about the nursing process.²³

In the light of all these results, in this study, positive attitudes and experiences of students regarding the nursing process are an important finding. It is important for students to adopt the nursing process as it contributes to

their professional identity, starting from their student days. Because it enables them to internalize and use the nursing process in their professional life after graduation.

Step by step permanent learning

In the study, the students stated that laboratory work in teaching the nursing process is a good exercise before the clinic, and that they learned to see and analyze the whole

with group discussions under the guidance of educators. However, some studies show that the reasons for students' difficulties in applying the nursing process are the lack of appropriate education and practice on the scientific use of the nursing process in patient care.²⁵⁻²⁷ In the literature, it is frequently stated that students encounter the nursing process and writing a care plan for the first time in a clinical setting and have difficulties.²⁵ In a study conducted in Turkey, the authors state that students often have difficulties in terms of lack of knowledge and analytical thinking while writing a care plan in clinical practice, and they suggest adding case analysis and reinforcement to teaching methods.²⁸ In a study conducted by Farzi et al.,²⁹ students stated that they did not acquire the necessary skills to perform the operations in the clinical skills laboratory, and they also did not have the necessary cognitive knowledge to perform the operation. In another study, nurses stated that one of the biggest obstacles in the implementation of the nursing process is the education of the nursing process during student life, and the short and insufficient training period.³⁰

In the study, students often emphasized the benefit of group discussions for case analysis in the laboratory setting. In another study conducted in Turkey, students stated that the practices learned in the laboratory shortly before the clinical practice were more permanent, but the laboratory hours were limited due to the large number of students.⁴ It is thought that the exercises that include case analysis until the clinical practice process in the teaching of the nursing process are important in the preparation of the student for the clinic. In this context, this result obtained from the research is important.

Need Mentoring

In the study, students stated that while they were learning the nursing process in the clinic, they had problems at every step of the nursing process and they needed guidance to apply it to the patient. The expectation of the students in bedside guidance includes the educator assessment (collect, analyse and syntheses) with the student, making a diagnosis, and planning the care. It is reported that educators play a vital role in these problems and they are considered as "bridges" in filling the gap between theory and practice.³¹

Bedside guidance from educator offers students to integrate theory and practices through direct observation, interaction and facilitates effective knowledge translation, skills acquisition, and professional development.³² Gunay and Kiliç (2018) ' study participants (students) stated that instructors are knowledgeable, most often they don't tell at the bedside, but outside the sick room face-to-face, at a

seminar, at a meeting...etc.³³ Esmaeili et al.,³⁴ stated that the students learned the right skills by observing the behavior and practices of the trainer and seeing the right model increased their self-confidence. According to Benner et al.,³⁵ learning is the way that nurses use their knowledge as they think and act in ever-changing situations. When knowledge becomes integrated into the situation, that knowledge becomes embodied, easily accessible, and enables the nurse to continue to develop competency.³⁵

The nursing process when considered as a whole; is a basic framework in student education with its ability to take a holistic view of the individual and its contribution to the development of professional identity. According to Carpenito-Moyet,³⁶ the role of the educator is to teach the value, purpose and philosophy of the nursing process. In parallel, the educator should be with the student at each step of the implementation process and should guide him. For this reason, the guidance of the students, which is especially emphasized by the students in the teaching of the nursing process, and the elimination of the obstacles to the application of the knowledge will facilitate the teaching of the process. For this reason, in the teaching of the nursing process, the guidance of the students especially emphasized by the students, and the resolution of the obstacles to the implementation of knowledge will facilitate the teaching of the process.

Limitations of the study

A limitation of the present study is that we cannot rule out the possibility that the participants chose not to share some of their experiences of teaching the nursing process with the researchers at the faculty where they were receiving their education. Another limitation that should be taken into consideration is that the study was conducted in a single region. However, the fact that the results are consistent with those obtained in other countries indicates that the problems and issues identified are not limited to our setting. Therefore, we believe that our findings contribute to the international knowledge on this subject.

As a result of the study, it was determined that the nursing process is a successful method in developing a holistic perspective to students; however, there are some obstacles in its implementation. Faculty members are in a key position in embracing the importance and values of the nursing process, developing constructive, creative, student-centered teaching strategies (case study, simulation based...etc.) and being a positive role model. It is clearly demonstrated that students need to be supported, encouraged, and get feedback in the learning process. According to the results of the research, it is important to develop clinical guidance in teaching the

nursing process. In particular, nursing educators, even mentor nurses in the clinical field, should prioritize one-to-one student guidance in teaching the nursing process, which is used as a scientific framework in patient care.

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Sexual Health Practices Evaluation Scale: A Methodological Study

Cinsel Sağlık Bakım Uygulamaları Değerlendirme Ölçeği: Metodolojik Bir Çalışma

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ABSTRACT

Objective: In this study, the Sexual Health Care Practices Assessment Scale (SHCP-AS) was developed to create a valid and reliable measurement tool to evaluate nurses' sexual health care practices.

Methods: Cross-sectional and methodological research methods were used in the study. The study population consisted of nurses working in hospitals in the Central Black Sea Region, and the sample consisted of 309 nurses who were selected using a random sampling method. Data were collected using a descriptive information form and SHCP-AS. Content validity and factor analysis were used to determine the scale's validity, two-half test reliability was used to determine the reliability, and the Cronbach Alpha reliability coefficient was calculated.

Results: According to the results of the exploratory factor analysis of the scale, Kaiser-Meyer-Olkin test value was 0.98, Barlett's test $\chi^2 = 13275.67$, $df = 703$, $P < .000$. The SHCP-AS consisted of two sub-dimensions titled "Initiating and Maintaining Communication" and "Sexual Health Care Practices" and 30 items. Cronbach's Alpha values were 0.98 for the overall scale, 0.96, and 0.94 for the subgroups. McDonald's Omega Coefficient values were 0.98 for the overall scale, 0.98, and 0.94 for subgroups. Two-half test reliability was calculated with the Spearman-Brown formula after the scale was divided into two equivalent halves, and the result was found to be 0.98.

Conclusion: In the study, it was found that the SHCP-AS is a valid and reliable measurement tool in determining the sexual health care practices of nurses. It is recommended that the psychometric structure of the scale should be evaluated with more comprehensive studies on different samples.

Keywords: Sexuality, sexual health care, nursing, practices, scale development.

ÖZ

Amaç : Bu çalışmada, hemşirelerin cinsel sağlık bakım uygulamalarını değerlendirmede kullanılacak geçerli ve güvenilir bir ölçüm aracı oluşturma amacıyla Cinsel Sağlık Bakım Uygulamaları Değerlendirme Ölçeği (CSBU-DÖ) geliştirilmiştir.

Yöntemler : Araştırmada kesitsel ve metodolojik araştırma yöntemleri kullanılmıştır. Araştırmanın evrenini Orta Karadeniz Bölgesi'ndeki hastanelerde çalışan hemşireler, örneklemini ise gelişigüzel örneklem yöntemi ile seçilen 309 hemşireden oluşmuştur. Veriler, tanıtıcı bilgi formu ve CSBU-DÖ kullanılarak toplanmıştır. Ölçeğin geçerliğinin saptanmasında kapsam geçerliği ve faktör analizi, güvenilirliğinin saptanmasında iki yarım test güvenilirliği kullanılmış, Cronbach Alpha güvenilirlik katsayısı hesaplanmıştır.

Bulgular : Ölçeğin açıklayıcı faktör analizi sonuçlarına göre Kaiser-Meyer-Olkin test değeri 0,98, Barlett testi $\chi^2 = 13275,67$, $df = 703$, $P < ,000$ olarak bulunmuştur. CSBU-DÖ "İletişimi Başlatma ve Sürdürme" ve "Cinsel Sağlık Bakım Uygulamaları" başlıklı iki alt boyut ve 30 maddeden oluşmuştur. Ölçeğin tüm alt boyutlarında Cronbach Alpha değerleri ölçek geneli için 0,98, alt gruplar için 0,96 ve 0,94 olarak bulunmuştur. McDonald's Omega Katsayısı değerleri ölçek geneli için 0,98, alt gruplar için 0,98 ve 0,94 olarak bulunmuştur. İki yarım test güvenilirliği ölçek eşdeğer iki yarıya bölündükten sonra Spearman Brown formülü ile hesaplanmış ve sonuç 0,98 olarak bulunmuştur.

Sonuç : Araştırmada CSBU-DÖ'nün hemşirelerin cinsel sağlık bakım uygulamalarını belirlemede geçerli ve güvenilir bir ölçme aracı olduğu saptanmıştır. Ölçeğin psikometrik yapısının daha kapsamlı ve farklı örneklemeler üzerinde yapılacak çalışmalarla değerlendirilmesi önerilmektedir.

Anahtar Kelimeler: Cinsellik, cinsel sağlık bakım, hemşirelik, uygulamalar, ölçek geliştirme.

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INTRODUCTION

The World Health Organization defines sexual health as "the physical, emotional, and social well-being of individuals about their sexuality and related physical, emotional, and social well-being."¹ Sexual health is affected by many factors, such as genetics, cultural and social values, previous sexual experiences, sexual identity, sexual myths, chronic diseases, and treatment processes. For example, psychological stress, peripheral neuropathy, or medications used in individuals diagnosed with diabetes significantly affect sexual desire. Sexual desire and function may also be impaired in individuals diagnosed with cancer or receiving chemotherapy treatment, and individuals may be negatively affected emotionally, physically, and psychologically.² In general, sexual health may be ignored in nursing care. However, nurses must provide holistic care to individuals, including sexual health care. Due to the effect of deviations from health on sexual life, individuals' concerns and problems related to sexual health should be the focus of nursing care. Promotion and support of sexual health is one of the essential elements of nursing care and should be considered as a priority approach together with other health needs. The provision of sexual health services is an integral part of holistic care aimed at improving the overall health and quality of life of individuals. In this context, nurses have a critical role in raising awareness about sexual health issues, providing counselling, and organizing appropriate care services.³ Although nurses generally agree that sexual problems of individuals should be addressed and discussed as part of health services, they hesitate to take an active role in clinical practice. Factors such as nurses thinking that patients will feel uncomfortable during sexual health care⁴, not having enough preparation, knowledge, and skills to address a unique subject that is seen as taboo in society, and sexual health care practices not being part of the clinical culture⁵ are among the barriers to providing sexual health care. Studies have revealed that health professionals experience inadequacy in sexual health care practices and that special education is necessary in this field. However, the majority of nursing education programs do not offer comprehensive training to develop teaching or counselling skills related to sexual health care practices. This situation necessitates the restructuring of education programs to overcome the knowledge and skill deficiencies in sexual health. Annerstedt and Glasdam⁶ point out that the deferral and neglect of sexual health care is a consequence of existing ideas and discourses about sexual health in society that drive actions and attitudes towards care. The authors describe nurses' initiation of conversations about sexual health care as "moving beyond the implicit agenda," where

nurses address sexual health quickly and briefly and then immediately shift the conversation to another aspect.⁶

All these factors emphasize the complexity of the problems encountered in sexual health care and the importance of an appropriate model to help individuals receiving nursing care cope with sexual health problems. In the relevant literature, many models are guiding the provision of sexual health care. These models include ALARM (A: Activity, L: Libido, A: Arousal, R: Resolution, M: Medical History), PLISSIT (P: Permission, LI: Limited Information, SS: Specific Suggestion, IT: Intensive Therapy), BETTER (B: Bring up, E: Explain, T: Tell, T: Time, E: Educate, R: Record) and IMB (I: Information, M: Motivation, B: Behavioural Skills) models. The PLISSIT model, which provides a systematic approach to sexual health care and consists of permission, limited information, unique recommendations, and intensive therapy steps, is the most widely known and used among these models.⁷ The PLISSIT model provides nurses and other health professionals with a short framework for sexual health care practices in order to identify the individual's needs for sexual health care and plan practices, and allows the individual's concerns about sexuality to be evaluated at the earliest stage.⁸ It is recommended that practices based on the PLISSIT model be used effectively in the evaluation of sexual health care practices of individuals living with a stoma, patients with chronic disease, or those receiving care after hysterectomy. This model provides a structured framework for determining the sexual health needs of individuals and planning appropriate interventions.⁹ Although various scales have been developed to evaluate nurses' attitudes and beliefs about sexual health care¹⁰ and to measure the effectiveness of sexual health education, a measurement tool based on the PLISSIT model to evaluate nursing practices in sexual health care has not yet been developed. This deficiency constitutes an important gap in the systematic evaluation and improvement of nursing practices. Clarifying nurses' attitudes and practices towards sexual health care practices in each of the steps of the PLISSIT model will help to identify barriers to sexual health care. This study was conducted to develop the Sexual Health Care Practices Assessment Scale (SHCP-AS) to determine nurses' tendencies to provide sexual health care to individuals based on the PLISSIT model.

METHODS

Design

In this study, a cross-sectional and methodological research design was used to conduct the validity and reliability of the SHCP-AS. In developing the scale, the steps of creating the item pool and content validity, validity, and reliability

analyses were followed. The process for the development of the SHCP-AS is shown in Figure 1.

Population and Sample of the Study

The population of the SHCP-AS development study consisted of nurses working in hospitals in the Central Black Sea Region of Turkey, and the sample consisted of 309 nurses who were included in the study by random sampling method. The literature recommends that the sample in scale development studies should be 5-10 times the number of items¹¹⁻¹³, and at least 200 participants¹⁴ should be reached to create an appropriate structural equation model. In this study, 8.13 times the number of items (38 items) was reached with 309 participants.

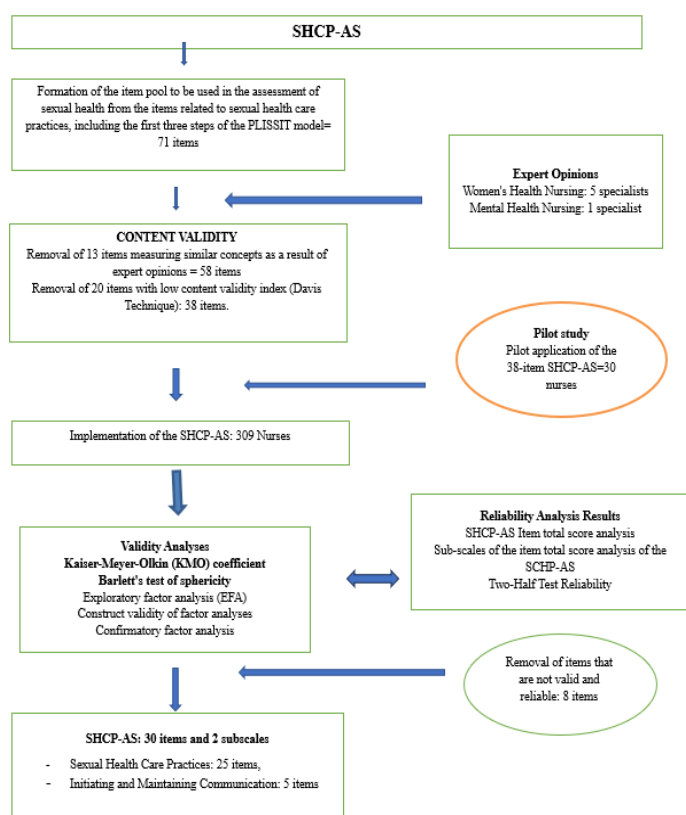


Figure 1. Summary of the Study Methodology

Inclusion and Exclusion Criteria

The inclusion criteria were working as a nurse and agreeing to participate in the study. Failure to complete the SHCP-AS entirely was determined as an exclusion criterion.

Data Collection

The data were collected using an introductory information form and the SHCP-AS. In the study, the data were collected face-to-face in one of the hospitals and through an online form created using Google Free Online Form Builder in the other two hospitals. IP limitation was introduced through the Google Forms site to eliminate the possibility of

repeated filling of data collection forms online.

Introductory Information Form

The descriptive information form consisted of 7 questions about the general characteristics of the participants, such as age, gender, educational status, marital status, service and position, duration of employment, and number of patients cared for daily.

Creating a SHCP-AS Item Pool

In creating the item pool of the scale, articles on the PLISSIT model,^{4,15,16} observations and experiences of the researchers, and the results of quantitative^{2,17} and qualitative^{18,19} studies on sexual health care practices were examined. The draft scale included 71 items about sexual health care practices related to the permitting, limited information, and unique recommendations sections of the PLISSIT model. A 5-point Likert scale (ranging from "Never-1" to "Always-5") was used for scoring the SHCP-AS.

Content Validity

Expert opinions were consulted to evaluate the language and content validity of the items in the item pool. The expert group consisted of 6 people, five women's health and obstetrics nursing and one mental health nursing faculty member. In the selection of the expert group, the criteria of having at least a doctorate, having previous publications on the scale development process, and working on sexual health issues were taken into consideration. Davis's technique was used to evaluate the expert opinions. Experts evaluated the relevance and comprehensibility of the items using a four-point Likert scale (1- Appropriate, 2 - Item should be slightly revised, 3- Item should be seriously revised, 4 - Item is not appropriate). After all expert opinions were obtained, the number of experts who marked options (1) and (2) on the scale items were divided by the total number of experts, and the Content Validity Index (CVI) was obtained. It was found that the CGI value of the SHCP-AS was 0.96. According to the Davis technique, items with a CGI ≥ 0.80 in the draft scale are considered adequate regarding content validity, while items with a CGI value lower than 0.80 should be removed from the scale. (20 this context, 18 items with a CGI score of 0.66, 2 items with a CGI score of 0.50, and 13 items with the same meaning in line with expert opinions were removed from the scale.²⁰ As a result, a 38-item draft SHCP-AS was made ready for pilot application.

Pilot implementation

The pilot study of the SHCP-AS, which was developed in line with expert opinions and consisted of 38 items, was conducted with the participation of 30 nurses. Within the content of this pilot study, the readability,

comprehensibility, and response time of the scale were evaluated. The participants completed the scale within 10-15 minutes and gave no negative feedback about the scale's readability, comprehensibility, or response time. It was decided to apply the SHCP-AS as it was prepared for the pilot application. The data obtained from the pilot application were not included in the sample.

Data Analysis

The data were analysed using Statistical Package for the Social Science (IBM SPSS Corp., Armonk, NY, USA) 24 and SPSS Analysis of Moment Structures (AMOS) programs. Content validity and factor analysis were conducted within the content validity analyses. Cronbach Alpha reliability coefficient and two-half test reliability analyses were conducted within the scope of reliability analyses. The methods used in data analysis are shown in Table 1.

Table 1. Statistical methods used in the SHCP-AS		
		Statistical Method
Validity Analysis		
Interpretive validity	Content validity	Davis Technique Pilot implementation
Construct validity	Factor analysis	Kaiser-Meyer-Olkin (KMO) coefficient Barlett's test of sphericity Exploratory factor analysis (EFA) Confirmatory factor analysis (CFA)
Reliability Analysis		
Internal Consistency	Cronbach Alpha Reliability Coefficient	Cronbach Alpha Coefficient McDonald's Omega Coefficient
Scale Stability	Two-Half Test Reliability	Spearman Brown Correlation Coefficients

Ethical Dimension of the Research

Ethics committee approval for the study was obtained from Ondokuz Mayıs University Social and Human Sciences Research and Publication Ethics Committee (Date: 31.05.2024, Number: 2024-578). Before starting to collect the data, the researcher informed the participants about the purpose of the study, that participation in the study was voluntary, that they could leave the study at any time, and that the information was confidential. The researcher also obtained their verbal consent. In the online forms, participants could access the items after marking the phrase 'I accept the research' before data collection.

RESULTS

The findings obtained from the data analysis are presented under the headings exploratory factor analysis, determination of factor pattern, confirmatory factor analysis, and reliability analysis.

Characteristics of Participants

Of the nurses who participated in this study, 96.8% (n=299) were female, 60.8% (n=188) were married, and the mean age was 32.16±8.00. The nurses' mean number of years of employment was 9.84±8.5; 80.6% were undergraduate (n=249), and 13.3% were postgraduate (n=41). 93.5% of the participants worked as clinical nurses (n=289), and 56% worked in internal units (n=173). While 44.7% of the nurses' care for 1-10 patients daily (n=138) in the clinic, the others care for 11 or more patients.

Assessing the Suitability of Data for Factor Analysis

In order to conduct factor analysis, KMO and Barlett tests are recommended to determine the suitability of the data structure formed by the variables obtained from a particular sample for factor analysis.¹³ A high KMO value indicates that the other items can explain each item in the scale to a very high degree.²¹ The KMO value of the SHCP-AS was found to be 0.98, and the Barlett Sphericity Test value was statistically significant ($\chi^2=13275.66$; df = 703, $P<.001$). This value indicates that the sample size is "perfect" for factor analysis.^{11,22}

Determination of Factor Design

Principal components analysis and the Direct Oblimin method, one of the oblique rotation methods used in cases where the data set is large, were used to determine the factor pattern of SHCP-AS.^{11,12}

Determination of the number of factors

In order to determine the number of factors in the scale, slope accumulation, eigenvalue, and variance percentages were used.²² The table (Table 2) and slope accumulation graph (Figure 2) for eigenvalues and variance percentages are below.

Table 2. SHCP-AS Factor Structures (Unrotated Variance Values)

Factors	Eigenvalues	Explained Variance (%)	Total Variance (%)
Factor 1	20.02	66.74	66.74
Factor 2	1.21	4.05	70.79

As a result of EFA, two factors with an eigenvalue of 1 and above were identified for 38 items. This is also clearly seen

in the scree plot. When the scree plot with factors on the vertical axis is examined, it is seen that the sharp decline decreases after the third point. Each interval with an eigenvalue greater than 1 means one factor.^{11,22} This information revealed the two-factor structure of the SHCP-AS.

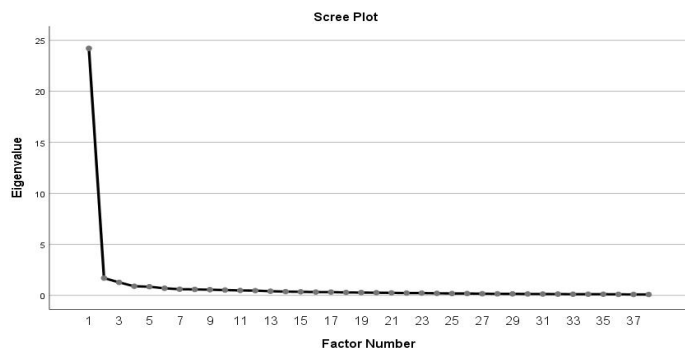


Figure 2. Scree Plot

Determination of factor items

After determining the number of factors of the scale, the items in the factors were examined. The rotated component matrix was examined to determine which factor the items were more concentrated, and overlapping items and factor loading values were examined. No overlapping items were detected in the EFA analysis of the SHCP-AS. Regarding scale validity, the factor loadings of the items should be above 0.40.¹² Accordingly, eight items with factor loadings less than 0.40 were removed from the SHCP-AS. With removing these items, there were no items with factor loadings below 50%. As a result, a 30-item SHCP-AS with two factors explaining 70% of the total variance was obtained. The factors were named (1) Sexual Health Care Practices (SHCP) and (2) Initiating and Maintaining Communication (IMC) in line with their content. It is recommended that the total variance value should be between 40-60% (at least 50%) in multidimensional scales. 11-13 Factor 1 in the SHCP-AS consists of 25 items explaining 66.7% of the variance, while Factor 2 consists of 5 items explaining 4.05% of the variance, and the total variance explained by the scale is 70.8 (Table 3).

When the items in the scale are examined, the 2nd sub-dimension, "Initiating and Maintaining Communication," corresponds to the practices in the five-item permission (P) step, the first step of the PLISSIT model. Items 23, 31, 32, 36, 34, 33, 24, 22, 16, 19, 21, 14, 18, 26, 37, 20, 9 and 11 in the sexual care practices sub-dimension correspond to the Limited Information (LI) domain of the PLISSIT model, while items 30, 28, 35, 29, 13, 15 and 38 correspond to the Specific Suggestions (SS) domain. The increase in the usage

rates in the items created according to the PLISSIT model shows that the practices in the specified steps are frequently used.

Confirmatory Factor Analysis

The construct validity of SHCP-AS was tested with confirmatory factor analysis in the AMOS program by looking at χ^2/sd (Chi-square/Degree of Freedom), RMSEA (Root Mean Square Error of Approximation), GFI (Goodness of Fit Index), NFI (Normed Fit Index), TLI (Tucker-Lewis Index) and CFI (Comparative Fit Index) fit criteria. The fit indices of the model: $\chi^2=,000$, CMIN/DF = 2.75, RMSEA = 0.075, GFI = 0.80, NFI = 0.90, TLI = 0.93 and CFI index=0.93. As seen in Table 4, the fit indices of the SCHP-AS show that the model shows a good or excellent fit.¹² The regression-weighted AMOS Model of the SCHP-AS is presented in Figure 3. As a result of the data obtained as a result of confirmatory factor analysis, it was confirmed that the SHCP-AS, which consists of two factors, is a valid model (Figure 3).

Reliability Analyses

In this study, item statistics, Cronbach's Alpha reliability analysis, and the two-half test reliability method, which measures the scale's stability, were used to determine the reliability of the SHCP-AS, and the results are presented below.

Internal consistency analysis

The internal consistency of the SHCP-AS was evaluated by Cronbach Alpha reliability analysis, and the reliability coefficient of the whole scale was found to be $\alpha=0.96$ (Table 5). The reliability coefficients of the scale sub-factors were, respectively, SHCP: $\alpha=0.98$ and IMC: $\alpha=0.94$. Omega estimates are based on confirmatory factor analysis (CFA). Alpha and Omega produce different results when there is a difference between factor loadings, and the magnitude of this difference increases. However, when the average factor loadings are 0.7 or higher, and the difference between the loadings is 0.2 in absolute values, the difference between alpha and Omega is not expected to be very large.^{23,24} For this reason, both Cronbach's alpha and McDonald's Omega coefficients are shown in the table to show that the internal consistency analysis between the total scale and sub-dimensions in the study has a similar structure, and the consistency is found to be strong (Table 5). The minimum score to be obtained from the SHCP-AS, which consists of 30 items in total, is 30 (30x1), and the maximum score is 150 (30x5). While the score that can be obtained from the scale's SHCP sub-dimension is 25-125, the total score that can be obtained from the second factor, the IMC sub-dimension, varies between 5-25. There are no reverse-coded items in the scale. A high score on the scale

Table 3. Factor loadings of the items in the SHCP-AS draft scale (n=309).

PLISSIT	No	ITEMS	Factor Loadings		Variance Ratio	
			Factor 1	Factor 2		
Factor 1: SHCP						
SS	30	Provide sexual health care considering the age of the individual.	0.98		34.78%	
LI	31	Knows sexual health care is specific to the individual's situation.	0.92			
LI	23	Evaluates the effect of the individual's sexual health problems on his/her emotional state.	0.89			
LI	32	Gives information to the individual about sexual functions.	0.89			
LI	36	When providing information to the individual, aim to give realistic information about sexual performance.	0.89			
LI	34	Evaluates an individual's sexual health according to age/treatment/illness. Collects data to obtain information on sexual health specific to the individual's situation.	0.89			
LI	33	Collects data to obtain information on sexual health specific to the individual's situation	0.89			
SS	28	Talk to the individual about false beliefs (myths) about sexuality.	0.87			
LI	24	Inform the individual about the relationship between sexuality and hormones.	0.87			
LI	22	Teaches gender-specific differences and similarities in sexual health.	0.87			
LI	16	Evaluates the individual's knowledge of sexual health.	0.86			
SS	35	Provides orientation-specific sexual health care to LGBTI+ individuals.	0.84			
LI	19	Clarifies the individual's values and beliefs about sexuality.	0.79			
SS	29	Knows false beliefs (myths) about sexuality.	0.78			
SS	13	Plans sexual health care specific to the individual's disease/treatment.	0.77			
LI	21	Informs the individual about the physiology of sexuality.	0.76			
LI	14	Evaluates the effects of the individual's disease/treatment on his/her sexual health.	0.75			
LI	18	Discusses the effect of changes in body image on the sexual health of the individual.	0.75			
LI	26	Evaluates the satisfaction of the individual with the frequency of sexual intercourse.	0.70			
LI	37	Discusses sexual health problems such as arousal, erection, ejaculation, orgasm, and painful intercourse with the individual.	0.66			
SS	15	Assesses the individual's knowledge of situation-specific sexual positions.	0.61			
SS	38	Presents unique suggestions specific to sexual problems with training material.	0.59			
LI	20	Uses words related to sexual health (erection, sexual intercourse, masturbation, orgasm, etc.) as they are.	0.57			
LI	9	Tells the individual that he/she has the right to terminate sexual health care at any time.	0.56			
LI	11	Includes the individual's partner in the sexual health care process.	0.53			
Factor 2: IMC						
P	2	Enables the individual to express his/her feelings about sexuality.		0.86		4.05
P	1	Encourages the individual to talk about sexual health.		0.85		
P	3	Evaluates the changes in the sexual life of the individual.		0.72		
P	4	Teaches individuals different ways of expressing sexuality.		0.68		
P	5	Talk to individuals about issues related to sexual health.		0.55		
TOTAL SCALE					68.15	
SHCP: Sexual Health Care Practice, IMC: Initiating and Maintaining Communication, P: Permission, LI: Limited Information, SS: Spesific Suggestions						

SHCP; Sexual Health Care Practice, IMC; Initiating and Maintaining Communication, P; Permission, LI; Limited Information, SS; Specific Suggestions

Table 4. Fit indices for the SHCP-AS model

Fit index	Fit indices of the SHCP-AS	Reference	Conclusion
χ^2/df	2.75	< 5	Perfect fit
RMSEA	0.075	< 0.08	Good fit
GFI	0.80	> 0.90	Perfect fit
NFI	0.90	> 0.90	Perfect fit
TLI	0.93	> 0.90	Perfect fit
CFI	0.93	> 0.90	Perfect fit

SHCP-AS; Sexual Health Practices Evaluation Scale, χ^2 ;Ki-kare; df; degree of freedom , RMSEA; Root Mean Square Error of Approximation, GFI; Goodness of Fit Index, NFI; Normed Fit Index, TLI; Tucker-Lewis Index, CFI; Comparative Fit Index

Table 5. Total scale and sub-dimensions score ranges and Cronbach's alpha coefficients

Scale and subgroups	Number of items	Lower and upper score possible	Mean score ($\bar{x} \pm SD$)	Cronbach alfa (α)	McDonald's Omega coefficient (ω)
SHCP	25	25-125	69.43± 26.19	0.95	0.98
IMC	5	5-25	13.34± 5.00	0.93	0.94
Total Scale	30	30-150	82.78± 30.45	0.98	0.98

SHCP; Sexual Health Practices, $\bar{x}$; Mean, SD;standard deviation, IMC; Initiating and Maintaining Communication

indicates that the participants have a positive attitude towards evaluating sexual health care practices.

Item Statistics

Item-total correlations were examined in line with the item statistics in the SCHP-AS, and items with a correlation value below 0.40 were removed from the scale. After these items were removed, the item-total correlations of the 30-item scale were recalculated. The item with the highest item-total correlation was item 32 (I provide information to the individual about sexual functions) with 0.90, while the item with the lowest item-total correlation was item 11 (I include the individual's partner in the sexual health care process) with 0.62.

Two-Half Test Reliability

Two halves or equivalent halves test reliability is a method in which the items of a scale are divided into two and considered as two different scales. The relationship between these two scales is interpreted.²⁵ In this study, the items of the scale were divided into two equivalent halves by assigning odd and even items to separate halves. After the scale was divided into two equivalent halves, the Spearman-Brown formula was used to calculate the relationship between these two halves, and the result was

found to be 0.98. This result shows that the items in one half of the scale exemplify the same behaviour as those in the other half, and the internal consistency is high.²⁶

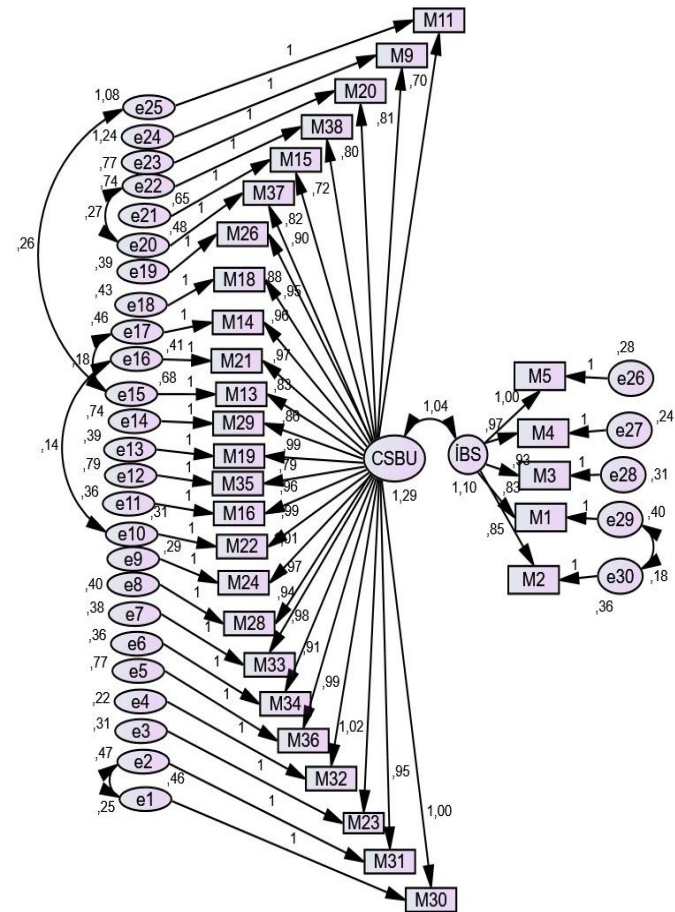


Figure 3: Regression Weighted AMOS Model of SHCP-AS (n=309)

DISCUSSION

In this article, the psychometric properties of SHCP-AS, which was developed as a scale to evaluate the practices that nurses plan and realize during sexual health care, were presented. This study revealed that the SHCP-AS is a valid and reliable tool for evaluating sexual health care practices. Since the Cronbach Alpha values of the total and sub-factors of the scale were more significant than 0.70^{22,25,26}, the SHCP-AS was considered a reliable measurement tool.

In this study, the content and construct validity analyses of the SHCP-AS, which was created based on the studies in the national and international literature²⁷⁻³⁰, were conducted. Content validity evaluates whether each item in the scale serves the purpose to be measured. It is stated that at least five experts should be consulted in evaluating content validity.^{31,32} 6 experts were consulted in the evaluation of the content of the SHCP-AS. The experts gave the items a score between 1 and 4. In evaluating these scores using the

Davis technique; it was decided to keep the 38 items with a content validity index of 0.8 and above 20 on the trial scale.

In scale development studies, it is recommended that a trial study be conducted before the actual implementation.¹¹ Thus, it can be evaluated whether the questions in the trial questionnaire are understandable and answerable by the participants. The trial study of the SHCP-AS was conducted with 30 nurses, and it was found that the scale items were understandable and answerable.

EFA allows examining the relationships between the variables that make up a concept, bringing together variables related to each other and explaining the concept with factors.³³ Thus, the structure consisting of many complex variables can be explained concisely with a few conceptually meaningful new variables (factors). The fact that the total variance explained by the factors is at least 50%¹¹⁻¹³ and the factor eigenvalues are more significant than one means that 50-75% of the total variance is explained.^{21,34} With the EFA conducted to evaluate the construct validity and factors of the SHCP-AS, a structure with two sub-dimensions with eigenvalues ≥ 1.0 and explaining 68.7% of the total variance of the scale was obtained. This result points to the structural validity of the two-factor structure of the SHCP-AS in measuring sexual healthcare practices in nurses.¹¹

In this study, CFA was conducted to test the accuracy of the factor design of the SHCP-AS. CFA is used to determine whether the items in the scale adequately represent and explain the determined sub-factors. The model's fit is determined in CFA by examining the fit indices and factor loadings. χ^2/df , GFI, AGFI, CFI, IFI, and RMSEA are used to test the model's fit.^{11,21,25} The two-subdimensional design of the SHCP-AS, which emerged after EFA, shows that the data fit the model and confirm the two-factor structure; the scale items and sub-factors are related to the scale. The items in each subscale explain their factors. GFI, CFI, and NFI >0.90 and RMSEA <0.080 in the scale. The good fit of the data indicates that the SHCP-AS is an appropriate measurement tool for assessing nurses' attitudes toward the barriers, they encounter during sexual health care.

The reliability of the SHCP-AS was assessed using two-half test reliability and internal consistency reliability. Reliability indicates the consistency exhibited when a measurement is repeated under the same conditions. Cronbach's alpha value, which is one of the methods used to evaluate the reliability of a scale and is an internal consistency coefficient, evaluates the internal consistency of the scale items, that is, the extent to which the set of items in the scale shows common variation according to their total

scores. A value above 0.70 is generally accepted as an acceptable threshold in terms of reliability.¹¹ Within the content validity of the reliability analysis of the SHCP-AS, firstly, the internal consistency coefficient was examined, and the total Cronbach Alpha value of the scale was found to be 0.95. The Cronbach Alpha values of the subgroups were found to be 0.95 for SHCP and 0.93 for IMC. This result shows that the scale is highly reliable and can adequately measure the concepts. The items in the scale measure the same conceptual structure compatible with each other and the consistency of the items.^{11,25}

Another stage of the scale development process is to evaluate whether the items obtained from EFA and CFA are simple, functional, and internally consistent. In this context, inter-item and item-total correlation analyses examine the existing relationships between items and the extent to which items assess the same content. It is recommended that items with very low correlation values ($P<.30$) should not be included in the scale.^{11,35} When the correlation values were examined in the SHCP-AS and its subgroups, they were statistically significant and above 0.40. These results indicate that the items of the SHCP-AS have a sufficient correlation with the subgroup and other items of the scale and that the scale is reliable.^{12,25,32} It is thought that the SHCP-AS, whose validity and reliability were determined in this study, will be a helpful measurement tool to evaluate nurses' sexual healthcare practices based on the steps of the PLISSIT model. The SHCP-AS is suitable for determining nurses' needs for improving sexual health care services in sexual health care practices based on the PLISSIT model. The scale can be used to develop an awareness of nurses' sexual health care practices, to investigate the frequency of practices, to discover neglected aspects of sexual health care practices, and to evaluate the effectiveness of different training programs and interventions to improve sexual health care competence.

Limitations

The SHCP-AS is a measurement tool whose validity and reliability have been validated to assess nurses' sexual health practices. Despite its strengths, the main limitation of the SHCP-AS is that the EFA and CFA were applied to the same sample group due to the low motivation of nurses to participate in the studies during the data collection process.

In this study, the SHCP-AS was a consistent and valid measurement tool for evaluating sexual health care practices in nurses. It is thought that SHCP-AS is a valuable measurement tool for evaluating nurses' attitudes towards sexual health care practices and planning in-service training

to include these care practices. It is recommended that psychometric validity and reliability studies of SHCP-AS be conducted in other countries to evaluate and compare cultural practices regarding sexual health care practices. In addition, it is thought that using SHCP-AS in mixed design studies will contribute to the field since it will clarify the findings obtained with SHCP-AS and allow obtaining holistic data on sexual health care practices in the research group.

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The Effect of Organizational Culture on Nurses' Attitudes Toward Productivity

Örgüt Kültürünün Hemşirelerin Verimliliğe İlişkin Tutumuna Etkisi

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ABSTRACT

Objective: This study aimed to investigate the effects of nurses' sociodemographic characteristics, professional characteristics, and organizational culture on nurses' attitudes toward productivity.

Methods: This descriptive and relational study was conducted between January 2018 and April 2018 with 352 nurses who had been working in four hospitals in İstanbul (Türkiye) for at least six months. Data were collected using the "Individual Descriptive Characteristics Form," the "Denison Organizational Culture Scale," and the "Attitudes Towards Productivity Scale". Descriptive statistics, Pearson correlation, and multiple regression analysis (backward method) were used for the analysis of the data.

Results: While the participating nurses' attitudes towards productivity levels were close to average, their organizational culture levels were moderate. A positive, strong, and highly significant relationship was found between organizational culture and nurses' productivity attitudes ($r=0.61$; $P<.001$). Regression analysis demonstrated that nurses' productivity attitudes were affected by seven variables ($R^2: 46$, $P<.001$, Durbin Watson: 1.82).

Conclusion: The results of the study show that the two sub-dimensions of the Denison Organizational Culture Scale, work unit, willingness to work in the unit, workload perception, type of institution, and satisfaction with institution were important factors affecting nurses' productivity attitudes. Hospital administrators and executive nurses should develop strategies of developing nurses' productivity attitudes by considering organizational culture.

Keywords: Attitude, nurse, nurse productivity, organizational culture, productivity

ÖZ

Amaç: Bu çalışmada hemşirelerin sosyodemografik özellikleri, mesleki özellikleri ve örgüt kültürünün hemşirelerin verimliliğe yönelik tutumları üzerindeki etkilerinin incelenmesi amaçlanmıştır.

Yöntemler: Tanımlayıcı ve ilişkisel tipteki bu çalışma, Ocak 2018-Nisan 2018 tarihleri arasında İstanbul'da (Türkiye) dört hastanede en az altı aydır çalışan 352 hemşire ile yürütülmüştür. Veriler "Bireysel Tanımlayıcı Özellikler Formu", "Denison Örgüt Kültürü Ölçeği" ve "Verimliliğe İlişkin Tutum Ölçeği" kullanılarak toplanmıştır. Verilerin analizi için tanımlayıcı istatistikler, Pearson korelasyonu ve çoklu regresyon analizi (backward yöntemi) kullanılmıştır.

Bulgular: Katılımcı hemşirelerin verimliliğe yönelik tutum düzeyleri ortalamaya yakın iken, örgüt kültürü düzeyleri orta düzeydedir. Örgüt kültürü ile hemşirelerin verimlilik tutumları arasında pozitif, güçlü ve oldukça anlamlı bir ilişki bulunmuştur ($r=0,61$; $P<,001$). Regresyon analizi, hemşirelerin verimlilik tutumlarının yedi değişkenden etkilendiğini göstermiştir ($R^2: 46$, $P<,001$, Durbin Watson: 1,82).

Sonuç: Araştırma sonuçları, Denison Örgüt Kültürü Ölçeği'nin iki alt boyutu ile çalışılan birim, birimde çalışma isteği, iş yükü algısı, kurum türü ve kurumdan memnuniyetin hemşirelerin verimlilik tutumlarını etkileyen önemli faktörler olduğunu göstermektedir. Hastane yöneticileri ve yönetici hemşireler, örgüt kültürünü dikkate alarak hemşirelerin verimlilik tutumlarını geliştirmeye yönelik stratejiler geliştirmelidir.

Anahtar Kelimeler: Tutum, hemşire, hemşire verimliliği, örgüt kültürü, verimlilik

INTRODUCTION

Productivity of nurse manpower is at the center of healthcare organization planning, as it is directly related to the provision of quality patient care¹ with nurses playing an important role in health service delivery. Productivity is the ratio between input and output² and in nursing, productivity described as a measure of efficiency with which labor, materials and equipment are convert into goods and services.³ Control of productivity is a critical part of a nurse manager's responsibility, but direct measures of nursing productivity are not yet available.² Nurse productivity is directly related to hospital productivity, as the health sector undergoes rapid structural change.⁴ Because nurses are actively responsible for maintaining organizational change, the factors affecting nurse productivity and efficiency should be determined.⁵

Encompassing the norms, beliefs, and basic assumptions that distinguish one organization from another, organizational culture is a powerful tool used to achieve desired organizational goals.⁶ Organizational culture categorized by Denison and Mishra⁷ as four traits: involvement, consistency, adaptability, and mission. Organizational culture plays an important role in organizational empowerment that affects self-efficacy.⁸ Because it is one of the main factors affecting hospital performance, organizational culture is of great importance for nurses, nurse managers, and hospital managers.⁹ Nurses play a key role in creating a strong organizational culture, which positively affects the quality and productivity of nursing services.¹⁰ If nurse managers establish a clear organizational culture, nurses may more easily shape their behaviors around it, ensuring continuity of the institution, as well as quality and efficient services.¹¹

The studies found that the following organizational factors positively affect nurse productivity: democratic and participatory corporate culture,¹² management leadership behavior,¹³⁻¹⁷ organizational support,¹⁸ managerial support,¹⁹ organizational trust,⁵ organizational commitment,^{5,14} future goals,²⁰ managers' competence,⁵ teamwork,^{16,21} working environment²²⁻²⁴ and adequacy of human resources.^{14, 24}

The factors that negatively affect nurse productivity, on the other hand, are: management's dismissal of subordinates' opinions and suggestions,^{12, 19} autocratic management style,¹⁹ unfamiliarity with corporate culture,⁴ promotion systems based on personal relations rather than merit²⁴, and insufficient wages.^{4,12,24-26}

Few studies have considered nurses' attitudes towards productivity and its affecting factors, and no study has been

found on the effect of organizational culture on nurses' productivity attitudes. Therefore, this study contributes to the literature and may help nurse managers develop strategies designed to create and maintain productivity-enhancing organizational culture.

AIM

This study aimed to determine the effects of nurses' sociodemographic characteristics, professional characteristics, and organizational culture on nurses' attitudes toward productivity.

Research questions/hypothesis

- What are the attitudes of nurses towards productivity?
- What are the factors (sociodemographic and professional characteristics and organizational culture) that affect nurses' attitudes towards productivity?

METHODS

Design

This is a descriptive and relational study.

Participants

This study's population consisted of 1,450 nurses with at least six months of experience working in one of four hospitals (one state, one university, one foundation university, and one private hospital) in Istanbul, Türkiye. Data collection forms were distributed to a total of 420 nurses, and the study was completed with a total of 352 nurses who filled out the form completely. In the post hoc power analysis performed with the G*Power (3.1.9.2) program, the effect size was found to be f^2 : .85 (large effect), and the power was 100% (1.00), resulting in a sufficient sample size.

Instruments

This study used a data collection form consisting of three parts: the "Individual Descriptive Characteristics Form," the "Denison Organizational Culture Scale," and the "Attitudes Towards Productivity Scale".

Individual Descriptive Characteristics Form

This form contained 16 questions concerning nurses' sociodemographic and professional characteristics (gender, age, marital status, educational status, duration of professional experience, duration of experience in the institution, type of institution, work unit, working style, position, duration of work in the position, satisfaction with the work unit, status of willingness to work in the unit, status of having willingly/unwillingly chosen the profession, satisfaction with salary, satisfaction with the institution, and workload perception).

Denison Organizational Culture Scale

Developed by Denison and Mishra in 1995, this scale is designed to measure organizational culture. The Turkish validity and reliability study of the scale was carried out by Yahyagil in 2004,²⁷ and the scale consists of 36 items and four basic dimensions: "involvement," "consistency," "adaptability," and "mission." It is a 5-point Likert type scale, with responses ranging from "(1) Strongly disagree," "(2) Disagree," "(3) Undecided," "(4) Agree," and "(5) Strongly agree." Items 4, 12, 18, 24, 30, and 34 are negative items and reverse scored. The scale was evaluated using the mean score method, and the overall Cronbach's alpha coefficient of the scale is 0.89. The Cronbach's alpha value was 0.67 for the sub-dimension of involvement, 0.76 for the sub-dimension of consistency, 0.61 for the sub-dimension of adaptability, and 0.82 for the sub-dimension of mission.²⁷ In this study, Cronbach's alpha reliability coefficient of the Denison Organizational Culture Scale was found to be 0.94 for the total scale, 0.84 for the sub-dimension of involvement, 0.83 for the sub-dimension of consistency, 0.79 for the sub-dimension of adaptability, and 0.87 for the sub-dimension of mission.

Attitudes Towards Productivity Scale

The Attitudes Towards Productivity Scale Developed by Göktepe and Baykal²⁸ for nurses' attitudes towards productivity. The Attitudes Towards Productivity Scale consists of 39 questions and five sub-dimensions: "Working Conditions," "Teamwork," "Demands of the Job," "Rewarding," and "Commitment to Profession." It is a 5-point Likert type scale, with responses ranging from: "(1) Strongly disagree," "(2) Disagree," "(3) Undecided," "(4) Agree," and "(5) Strongly agree." Items 1, 2, 3, 4, 12, 13, 16, 17, 18, 20, 22, 23, 24, 25, 26, 27, 28, 31, 32, 33, and 37 are negative items and reverse scored. The Cronbach's alpha coefficient of the scale is 0.88, and the Cronbach's alpha coefficient of the sub-dimensions is 0.81 for commitment to profession, 0.76 for working conditions, 0.76 for job demands, 0.73 for teamwork, and 0.64 for rewarding.²⁸ In this study, Cronbach's alpha reliability coefficient was found to be 0.88 for the total scale, 0.82 for the sub-dimension of commitment to profession, 0.83 for the sub-dimension of working conditions, 0.77 for the sub-dimension of demands of the job, 0.80 for the sub-dimension of teamwork, and 0.71 for the sub-dimension of rewarding.

Ethical Consideration

Ethics committee approval was obtained from the Koç University Social Sciences Research Ethics Committee (Date: January 4, 2018, Decision no: 2018. 005.IRB3.005), and permissions were received from the authors of both scales. Permission was also obtained from the

administrators of the hospitals in which the study was conducted. Participants were informed about the study, with participation being both voluntary and anonymous.

Data Analysis

Data were analyzed using the SPSS 24 (IBM SPSS Corp., Armonk, NY, USA) statistical package program. Number, percentage (%), mean, and standard deviation from descriptive statistics were used in the evaluation of the data. Compliance of numerical variables with normal distribution was evaluated with Skewness and Kurtosis values and the Kolmogorov-Smirnov test. Since Skewness and Kurtosis values were between +2 and -2, the distribution of the data was found to be normal. The relationship between the total and sub-dimension mean scores of the Denison Organizational Culture Scale and the total and sub-dimension mean scores of the Attitudes Towards Productivity Scale were analyzed by Pearson correlation analysis. The effect of independent variables on nurses' attitudes towards productivity was evaluated by multiple regression (backward method). Among the independent variables, a high level of correlation (autocorrelation) was found between age and duration of experience in the profession ($r = .86$). and therefore, these variables were not included in the regression model. A total of 14 variables were included in the model: duration of professional experience, duration of work in the position, working style, status of having willingly/unwillingly chosen the profession, satisfaction with wages, status of having willingly/unwillingly chosen the unit, perception of workload, type of institution, and satisfaction with the institution. The significance level was determined to be ($P < .05$).

RESULTS

Characteristics of the participants

The sociodemographic and professional characteristics of the nurses participating in the study are shown in Table 1. Of the participating nurses, 87.8% were women, 35.8% were between the ages of 25-29, and 54.8% were single. Over half (67%) of the nurses held a bachelor's degree, 31.0% worked as a nurse in a university hospital, and 33.2% worked in a private hospital. Most (76.9%) of the participants worked in an inpatient unit, 35.5% worked in 12-hour shifts, 86.6% worked as staff nurses, 88.4% worked willingly in the unit, and 75.6% chose the profession voluntarily. Over half (64.2%) of the participants indicated that they were not satisfied with their wages, 72.7% indicated that they were satisfied with the institution in which they worked, and 72.4% indicated that their perception of workload was greater than their actual working hours (Table1).

Table 1. Nurses' Demographics and Professional Characteristics Variables (n=352)

Variables	n	%
Gender		
Female	309	87.8
Male	43	12.2
Age		
18-24 years	80	22.7
25-29 years	126	35.8
30-34 years	65	18.5
≥ 35 years	81	23.0
Marital status		
Married	159	45.2
Single	193	54.8
Education status		
High School/Associate Degree	71	20.2
Bachelor's Degree	236	67.0
Master's Degree	45	12.8
Total duration of experience		
≤ 2 years	79	22.4
3-5 years	117	33.2
6-10 years	63	17.9
≥ 11 years	93	26.4
Duration of experience in the institution		
≤ 2 years	133	37.8
3-5 years	88	25.0
6-10 years	75	21.3
≥ 11 years	56	15.9
Institution type		
Government Hospital	126	35.8
University Hospital	109	31.0
Private Hospital	117	33.2
Work unit		
Inpatient units	271	76.9
Outpatient units	81	23.1
Work Shift		
8-hour day shifts	103	29.3
12-hour shifts	125	35.5
8-16-hour shifts	124	35.2
Position		
Staff Nurse	305	86.6
Nurse manager	47	13.4
Duration of position		
≤ 5 yıl	245	69.6
6-10 yıl	70	19.9
≥ 11 yıl	37	10.5
Willingness to work in the unit		
No	41	11.6
Yes	311	88.4
Willingness to choose the profession		
No	86	24.4
Yes	266	75.6
Satisfaction with the salary		
Not Satisfied	226	64.2
Satisfied	126	35.8
Satisfaction with the institution		
Not satisfied	96	27.3
Satisfied	256	72.7
Perceived workload		
Heavy	255	72.4
Balanced	97	27.6

Denison Organizational Culture and Attitude Scale on Productivity Scores

Nurses' total mean score for the Denison Organizational Culture Scale was $3.19 \pm .58$, with the highest score being $3.30 \pm .64$ for the "involvement" sub-dimension and the lowest being $3.10 \pm .66$ for the "consistency" sub-dimension (Table 2).

Table 2. Descriptive Statistics for Denison Organizational Culture Scale (n=352)

Scale and subscale	1-5 point	
	Minimum-Maximum score	$\bar{X} \pm SD$
Denison Organizational Culture Scale (Total)	1.56-4.89	3.19±.58
1. Involvement	1.56-5.00	3.30±.64
Empowerment	1.33-5.00	3.35±.74
Team Orientation	1.67-5.00	3.35±.71
Capability Development	1.00-5.00	3.18±.80
2. Consistency	1.33-4.78	3.10±.66
Core Values	1.00-5.00	3.24±.75
Agreement	1.00-5.00	3.09±.88
Coordination and Integration	1.00-4.67	2.98±.71
3. Adaptability	1.44-4.89	3.17±.61
Creating Change	1.00-5.00	3.12±.72
Customer Focus	1.00-5.00	3.29±.77
Organizational Learning	1.00-5.00	3.29±.77
4. Mission	1.56-5.00	3.19±.71
Strategic Direction and Intent	1.00-5.00	3.27±.83
Goals and Objectives	1.00-5.00	3.16±.85
Vision	1.33-5.00	3.13±.73
$\bar{X}$: Mean, SD: Standard Deviation		

The total mean score for the Attitudes Towards Productivity Scale was 48.97 ± 11.16 , with the highest score being 73.06 ± 14.96 for the "commitment to profession" sub-dimension and the lowest being 31.52 ± 16.28 for the "working conditions" sub-dimension (Table 3).

Table 3. Descriptive Statistics for Attitudes Towards Productivity Scale (n=352)

Scale and subscale	0-100 point	
	Minimum-Maximum score	$\bar{X} \pm SD$
Attitudes Towards Productivity Scale (Total)	16.67-87.18	48.97±11.16
1. Commitment to Profession	12.50-100.00	73.06±14.96
2. Working Conditions	.00-100.00	31.52±16.28
3. Demands of the Job	.00-93.75	39.70±17.41
4. Teamwork	9.38-100.00	61.90±17.75
5. Rewarding	.00-100.00	41.51±21.60
$\bar{X}$: Mean, SD: Standard Deviation		

Correlation Results between the Denison Organizational Culture Scale and the Attitudes Towards Productivity Scale

This study found a positive, significant, and strong correlation ($r=0.61$; $P < .001$) between nurses' Denison Organizational Culture Scale total score and sub-dimension scores and the Attitudes Towards Productivity Scale and its sub-dimensions scores (Table 4). It was determined that nurses with high Denison Organizational Culture scores had positive attitudes towards productivity (Table 4).

Regression Analysis Results

The results of the regression analyses are detailed in Table 5. Variables affecting the Attitudes Towards Productivity Scale total score were: Denison Organizational Culture Scale's mission and involvement sub-dimension, work unit ($P < .001$), willingness to work in the unit, workload perception, type of institution ($P < .01$), and satisfaction with the institution ($P < .05$). Seven variables explained the variance of the total score of the Attitudes Towards Productivity Scale at a rate of 46% (Table 5).

Table 4. Relationship Between Attitudes Towards Productivity Scale and Denison Organizational Culture Scale

Scale and subscale	Attitudes Towards Productivity Scale (total)		Commitment to Profession		Working Conditions		Subscales Demands of the Job		Teamwork		Rewarding	
	r	P	r	P	r	P	r	P	r	P	r	P
Denison Organizational Culture Scale (total)	.61	<.001	.38	<.001	.19	<.001	.38	<.001	.58	<.001	.57	<.001
Subscale Involvement	.53	<.001	.36	<.001	.12	.020*	.35	<.001	.54	<.001	.44	<.001
Subscale Consistency	.55	<.001	.28	<.001	.21	<.001	.37	<.001	.50	<.001	.52	<.001
Subscale Adaptability	.51	<.001	.36	<.001	.14	.010*	.28	<.001	.50	<.001	.52	<.001
Subscale Mission	.57	<.001	.35	<.001	.20	<.001	.36	<.001	.51	<.001	.56	<.001

r; Pearson Correlation Coefficient, * $P < .05$

Table 5. Factors Associated with Nurses' Attitudes Towards Productivity

Independent variables	B	SE	(β)	t	P	95% Confidence Interval	
						Lower limit	Upper limit
(constant)	-6.53	3.66		-1.785	.075	-13.72	.66
Mission	4.94	.87	.32	5.688	<.001	3.23	6.64
Involvement	3.85	.96	.22	4.006	<.001	1.96	5.74
Work unit	4.48	1.05	.17	4.285	<.001	2.43	6.54
Willingness to work in the unit	4.83	1.42	.14	3.409	.001	2.04	7.62
Workload perception	3.40	1.01	.14	3.359	.001	1.41	5.40
Type of institution	2.92	.98	.12	2.993	.003	1.00	4.84
Satisfaction with the institution	2.45	1.10	.10	2.230	.026	.29	4.62

R: .68 Adjusted R²: .46 F: 42.87 P < .001 Durbin Watson: 1.82

B: Beta, β : Standardized Beta, SE: Standard Error, t: t-test

DISCUSSION

This study found that nurses' level of attitude towards productivity was close to a medium level and that level of organizational culture was moderate. Nurses' attitudes towards productivity were determined by the organizational culture scale's mission and involvement sub-dimensions, type of institution, work unit, willingness to work in the unit, satisfaction with the institution, and perception of workload.

This study found that nurses' total mean score of the Attitudes Towards Productivity Scale was close to a

moderate level (48.97 ± 11.16), similar to the results of other studies in the literature.^{12,15,26,29,30} Farhadi et al.³¹ reported that nurses' perceptions of productivity were below average (44.97 ± 7.43), while Nazari et al.³² found them to be moderate. In line with these results, it is likely that nurses' attitudes towards productivity may differ due to the different management and institutional structures of the institutions/hospitals in which the studies were conducted.

This study determined that the Denison Organizational Culture Scale mission sub-dimension positively affected nurses' attitudes towards productivity. Although no studies

in literature focus on the relationship between organizational culture and nurse productivity, when nurses' attitudes towards productivity were examined in line with strategic management and organizational purposes, the leadership behavior of managers,¹³ organizational support,¹⁸ and manager performance and leadership style¹⁹ it was found that nurses' attitudes towards productivity positively affect actual productivity. It has been shown that good organization and directing of employees are key factors in increasing productivity¹⁹ while unfamiliarity with corporate culture negatively affects productivity.⁴ This finding may be due to the fact that nurse managers should convey the organization's mission to the nurses working under them, as well as that nurses' understanding of the organization's goals and mission will positively affect their productivity.

This study determined that the involvement sub-dimension of the Denison Organizational Culture Scale had a positive effect on nurses' attitudes towards productivity. The literature finds a significant relationship between nurse productivity and participation,³² teamwork,³³ good relations between managers and nurses,¹⁹ and democratic and participatory corporate culture¹², with these factors positively affecting productivity. It has been found that the toxic leadership behaviors of nurse managers, on the other hand, negatively affect nurse productivity.¹ Therefore, it may be argued that involvement in participatory organizational culture led by nurse managers positively affects nurses' attitudes towards productivity.

This study also found that nurses' attitudes towards productivity were affected by the work unit, with working in day-outpatient units resulting in increased productivity. While the study by Dikmen et al.²⁴ found no difference between the unit in which nurses work and the factors affecting labor productivity, Durmaz Talay and Harmancı Seren³⁰ determined that nurses working in specialized units had more positive attitudes towards productivity for the sub-dimension of demands of the job in the Attitude towards Productivity Scale. It has been determined that the working environment^{4,23,34} positively affects nurse productivity. When compared to those working in inpatient units, nurses working in day-outpatient units may have more positive attitudes towards productivity due to their patient profile, day shift work, ability to maintain work-life balance, and the difference in workload.

It has been found that nurses' willingness to work in their unit affects their attitudes towards productivity and that nurses who willingly chose their unit have more positive attitudes towards productivity, as confirmed by Durmaz Talay and Harmancı Seren.³⁰ The literature also suggests

that motivation-enhancing practices increase productivity.^{4,18,33} Therefore, it may be argued that nurses' participation in choosing their profession and unit positively affects nurse productivity by increasing their work motivation.

The current study determined that nurses who perceive their workload to be balanced duties and working hours have a more positive attitude towards productivity. Dikmen et al.²⁴ likewise show that a high workload negatively affects nurses' attitudes towards productivity. Hence, it is likely that giving nurses balanced workloads may improve nurses' attitudes towards productivity and therefore performance.

This study also determined that the type of institution in which nurses work affects their attitudes towards productivity. Previous studies have found that nurses working in private hospitals have a more positive attitude towards productivity than those working in state and university hospitals.^{12,29} This may be due to the fact that private hospitals have a more positive working environment and offer more opportunities for nurses.

This study also showed that nurses' satisfaction with the institution affected their attitudes towards productivity. Durmaz Talay and Harmancı Seren³⁰ also found that nurses who were satisfied with working in their institution were also more positive about productivity. In line with these findings, nurses who are satisfied with their institution and the opportunities it provides may have more positive attitudes towards productivity.

Limitations

Since this study is the first known study on the effect of organizational culture on nurses' attitudes towards productivity, the limited literature on the subject may have limited the discussion section of this study.

The results of this study illustrate the impact of organizational culture on nurses' attitudes towards productivity, showing that nurses are affected by the organizational culture of their hospitals and that organizational culture affects their attitudes towards productivity. In addition, the study found that the unit in which nurses work, nurses' willingness to work in their unit, perception of workload, type of institution, and satisfaction with the institution affect nurses' attitudes towards productivity.

In line with the results of this study, nurses' attitudes towards productivity can be improved by ensuring balanced workloads for nurses, organizing and improving working conditions and shift systems for nurses working in inpatient units, improving the work environment for nurses working

in state and university hospitals, and conducting studies designed to improve nurses' satisfaction with their unit and institution. Despite the fact that each organization has its own organizational and managerial culture, educating nurses about the specific organization's goals/mission and supporting nurse involvement can contribute to the improvement of nurses' attitudes towards productivity. Organizational culture is an important factor affecting productivity, and it is recommended that hospital and nurse managers implement activities to create and maintain productivity-enhancing organizational culture. In addition, it is recommended that future research should examine the impact of nurses' attitudes toward productivity on patient, nurse and organizational outcomes.

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Psychometric Evaluation of the Turkish Version of the Patients' Perceptions of Nurse' Cultural Competency Instrument

Hemşirenin Kültürel Yeterliğine İlişkin Hasta Algıları Ölçeğinin Türkçe Versiyonunun Psikometrik Değerlendirmesi

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ABSTRACT

Objective: The study aimed to examine the validity and reliability of the Turkish version of the Clients' Perceptions of Providers' Cultural Competency Instrument.

Methods: A methodological design was used. The study was conducted with 224 patients between June 1 and December 30, 2022. Data were analyzed with IBM SPSS V23 and IBM AMOS V24. The linguistic, content, and construct validity analysis were used to assess the scale's validity. The scale's reliability was achieved using Cronbach's α , item-total correlations, and test-retest. Path coefficients were calculated with Maximum Likelihood in structural equation modeling. Model fit was decided with model fit indices.

Results: According to our analysis, the final scale consisted of 19 items and 3 factors. Item-total correlations $> .2$ was obtained for all items. The construct validity analysis revealed that the model had a good fit; CMIN/DF=1.647, GFI= .901, CFI= .91, RMSEA= .054, SRMR= .076 and all path coefficients were significant ($P < .001$). Cronbach's alpha was found to be .81 for the scale. In addition, a good correspondence was found between the test-retest scores of all factors ($P < .05$). The patients' mean scores were 2.84 in factors 1 and 2 and 3.01 in factor 3. According to Tukey summability test, the scale was not recognized as summable ($P < .001$).

Conclusion: The instrument is a valid and reliable tool to assess the cultural competence of nurses.

Keywords: Cultural competency, nursing, patients, psychometrics

ÖZ

Amaç: Çalışmanın amacı, hemşirenin kültürel yeterliğine ilişkin hasta algılarını değerlendirme ölçeğinin Türkçe versiyonunun geçerliliğini ve güvenilirliğini incelemektir.

Yöntemler: Çalışmada metodolojik bir tasarım kullanıldı. Çalışma 1 Haziran-30 Aralık 2022 arasında 224 hasta ile tamamlandı. Veriler IBM SPSS V23 ve IBM AMOS V24 ile analiz edildi. Ölçek geçerliğinde dil, içerik geçerliliği ve yapı geçerliliği analizi kullanıldı. Ölçeğin güvenilirliğinde ise Cronbach α , madde-toplam korelasyonları ve test-tekrar test analizleri kullanıldı. Yol katsayıları yapısal eşitlik modellemesinde maksimum olabilirlik ile hesaplandı. Model uygunluğuna model uyum indeksleri ile karar verildi.

Bulgular: Analiz sonuçlarımıza göre nihai ölçek 19 madde ve 3 faktörden oluştu. Tüm maddeler için madde-toplam korelasyonları $> ,2$ elde edildi. Yapı geçerliliği bulguları iyi model uyumu gösterdi; CMIN/DF = 1,647, GFI= ,901, CFI= ,91, RMSEA= ,054, SRMR= ,076 ve tüm yol katsayıları anlamlı bulundu ($P < ,001$). Ölçeğin Cronbach's alpha katsayısı ,81 olarak bulundu. Ayrıca tüm faktörlerin test-tekrar test puanları arasında iyi bir uyum tespit edildi ($P < ,05$). Hastaların ölçekten aldıkları puan ortalamaları ise faktör 1 ve 2'de 2,84, faktör 3'te ise 3,01 olarak elde edildi. Tukey toplanabilirlik testine göre ölçeğin toplanabilir özellikte olmadığı belirlendi ($P < ,001$).

Sonuç: Ölçek hemşirelerin kültürel yeterliğini değerlendirmede geçerli ve güvenilir bir araçtır.

Anahtar Kelimeler: Hastalar, hemşirelik, kültürel yeterlilik, psikometri

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INTRODUCTION

The essence of the nursing profession is care. The care-giving role of nurses has been in existence for many years. The most effective implementation of this role can be ensured by providing equal and correct care services to all patients. The nurse must have sufficient knowledge, skills and competence to participate in the patient's care and determine the care needs. The most important is to determine the patient's needs according to their cultural characteristics. The correct care needs of patients not evaluated in this direction cannot be determined.¹

Cultural diversity is the most important outcome of current global change. Cultural transitions between nations, as well as within nations, have increased tremendously. Looking at the nature of migration, it is reported that migration to countries with growing economies, such as the United States, is relatively high. The most important reason for this is internal conflicts and increasing impoverishment in countries. Especially migration from the Syrian Arab Republic to Turkey, where internal conflicts are taking place, continues unabated. In this context, Turkey is the second largest transit corridor in the world. For the fifth consecutive year, Turkey has become the world's largest host country for more than 3.6 million migrants, mostly Syrians.² Thus, cultural diversity, as an undeniable fact, has affected many systems, especially health.

Health services are one of the main structures under the constitutional guarantee of countries and governments should develop sustainable policies for all people. As stated in the constitution, the state is obliged to protect the life, physical and mental health of everyone.³ However, the fact that migrants face many problems, especially communication, creates difficulties in achieving sustainable development goals.⁴ This makes it necessary to revise the provision of health care services. In the Harmonization Strategy Document and National Action Plan of the Ministry of Interior General Directorate of Migration Management⁵ developed in this context, it is emphasized that health care providers should understand patients from culturally different groups and ensure their active participation in care services.⁵ Therefore, it is one of the most important needs of today to be competent and sufficient in this respect to understand cultural differences in the provision of health care.

The concept of cultural competence expresses the understanding of cultural needs in healthcare. The fact that culture itself is a complex concept proves that cultural competence will be affected by all its dynamics. In multicultural societies, it is required to understand each cultural structure and provide services accordingly. This

situation involves both the evaluation of the patient and the understanding of the cultural structure in the provision of healthcare services. Hence, cultural competence in health care should be addressed in a comprehensive theoretical framework.⁶

The understanding of transcultural care in health care dates back to the 1950s. Leininger, who utilized the concept of transcultural nursing, first defined nursing as the essence of care.⁷ To reach this essence in cultural diversity and to contribute to the patient's well-being, nurses should understand the patient in every aspect. The development of this understanding is possible with the harmony between the caregiver and the care receiver. Harmony aims to ensure that care is meaningful, useful and adequate. Care is a very special concept embedded in culture. Therefore, Leininger emphasizes that the goals of culturally congruent nursing and culturally competent care are similar.⁷ By the end of the 1990s, Purnell explained the theory and model for culturally competent health care. The important role of health care providers in providing culturally competent care within the framework of 12 domains was emphasized. Within the framework of these 12 basic domains, the necessity of addressing all aspects of cultural care with sub-headings that can be created according to the needs of society has been emphasized.⁸ Schwarz et al.⁹ reported that in ensuring the concept of cultural competence, health care providers should take action in three important areas: (1) the awareness/sensitivity approach, (2) the multicultural/categorical approach, and (3) the cross-cultural approach. This can help to ensure cultural competence in health care.

Culturally competent care enables the most appropriate care environment for the patient and the team in the institution where care services are provided. Protecting the patient's health, maintaining well-being, and improving, rehabilitating and increasing survival in case of illness helps to achieve the goals set by health policies. For this reason, maintaining care services with cultural competence is extremely important and necessary, especially in immigrant and multinational nations. For culturally competent care to be successful, healthcare providers need to develop these skills. Various studies have shown that it is possible to enhance cultural care competence.^{10,11} In particular, trainings given to student nurses have shown positive results.¹² In Burkey et. al.¹³ study, which included students from different countries, students expressed the necessity of gaining cultural competence skills through various teaching techniques in course curricula.^{14,15} In their study, Burkey et al.¹³ emphasized that the concept of cultural competency should be added to the course

curricula for LGBTQ individuals. Therefore, gaining culturally competent care skills as early as possible can provide the most effective results in nursing care.

Culturally competent care is not limited to care provided in terms of different cultures, languages, and ethnic origins. Recent studies have highlighted the importance of using this concept in various groups. In their study, Mohamed and Modanloo¹⁶ addressed cultural care in elderly care and drew attention to age discrimination. Additionally, there are various studies indicating that health professionals should not ignore the culturally competent care of LGBTQ+ individuals.^{17,18} These results indicate that nurses are caregivers for a wide range of populations and that acquiring skills in culturally competent care is vital today. On the other hand, the evaluation of the cultural competence of caregivers by care receivers is also prioritized in developing this concept.

It was assumed that a unilateral approach to cultural care practice in health care would not be sufficient. In addition to the competence of caregivers in this regard, it is necessary to evaluate how the patient understands this situation. According to Pacquiao et al., the most accurate people who can evaluate culturally competent care are those who receive and experience care. It was also emphasized that the most important evidence of the cultural competence of health professionals is the acceptance of this competence by the individuals (clients) receiving care.¹⁹ An examination of the literature reveals that various studies have been conducted in which patients evaluate the cultural competence of caregivers.¹⁹ However, the measurement tools developed are reported to be long, difficult to use, and have limitations in some areas.⁹ The adaptation of a scale developed in recent years and suitable for use by various professional groups to Turkish culture was thought to meet a critical need, considering our society's cultural diversity.

AIM

The aim of this study is to conduct psychometric evaluation, validity, and reliability analysis of the Turkish version of the scale developed to determine patients' perceptions regarding the cultural competencies of the nurses who provide care to them.

METHODS

Study Design

This is a methodological study.

Participants

The research was conducted between 01 June and 30 December 2022 at a training and research hospital in

Turkey, which 300 beds hospital. A total of 250 patients who met the inclusion criteria were invited to participate in the study. However, 20 patients did not want to participate and 230 volunteer patients were included in the sample. When the data of these patients were analyzed, it was determined that the results of 6 patients did not comply with the normal distribution and were excluded from the analysis. In structural equation modeling (SEM) and especially in confirmatory factor analysis (CFA) using the maximum likelihood (ML) method, the assumption of normality is quite essential. In the ML method, the assumed normal distribution plays a critical role in the reliability of parameter estimates and the validity of specific fit indices (e.g., chi-square). Data that significantly deviates from normality can harm the model's overall fit and lead to misleading results. In this study, we excluded certain participants' data from analysis due to serious violations of normality. This decision has been made based on the Mahalanobis distance. To meet the requirements of the ML method and ensure that the fit indices affected by normality provide valid results, 6 participants were excluded from the study based on Mahalanobis distance. A total of 224 participants comprised the sample for all tests. The sample size was sufficient for the 23 items using the commonly applied rule of thumb of five to 10 subjects per item.²⁰

Data Collection Tools

Demographics Form: The researcher created the demographics form to obtain data about the patients' demographic features, such as age, gender, marital status, and profession.^{9,19}

The Clients' Perceptions of Providers' Cultural Competency Scale: Pacquiao et al.¹⁹ developed the scale. in 2021. The main approach to developing the scale was the World Health Organization's definition of empowerment based on Freire's pedagogy of the oppressed and Leininger's transcultural nursing theory. This revealed its difference from other scales in the literature.^{9,21} Another different aspect was that it evaluated the family and the environment at the same time as the client.

The primary purpose of the scale developed within this theoretical framework is to assess the cultural competence of health care providers in care practices. In this way, it is aimed to strengthen care services. It is a 4-point Likert scale composed of 23 items: strongly agree 4, agree 3, disagree 2, strongly disagree 1 and N/A 0. The original scale is organized into 3 factors: Promotes supportive and meaningful interactions (items 1-8), Promotes connections with others (items 9-15), Acts on behalf of others (items 16-23). The author of the original study reported that Item 3

was excluded from the analysis. This is because all the answers received 0 points and this did not affect the analysis result.

The Cronbach's α values of the factors were .82, .83, and .76 respectively and the Overall instrument Cronbach's α was .89. 49.6% of the total variance was explained.¹⁹ The scale's original language is English (Supplementary Table 1); the Turkish version is presented as a supplement in Supplementary Table 2.

Data Collection

The study data were collected by the researcher through face-to-face interviews with hospitalized patients (internal medicine, surgery, cardiology, chest diseases, urology, and orthopedics wards). The scale is suitable for completion by the patient, their family, or the researcher, as long as it is specified in the demographic section.¹⁹ Inclusion criteria: 1 inpatients receiving inpatient treatment and nursing care for at least 24 hours at the time of the study, 2 between the ages of 18-85 years, three who could understand and speak Turkish even if their native language was not Turkish. In addition, illiterate patients (informed consent have been obtained from the patient's wife/husband or child) were also included in the study. The researcher read the questions, and the patient was allowed to answer them. Exclusion criteria: 1 patient who did not complete 72 hours post-op, 2 had severe pain, 3 were healthcare workers or students, 4 could not communicate in Turkish, 5 did not agree to participate in the study.

Before the study, the language validity phase of the scale was completed. First, the researcher and expert, an academian, translated the scale from English to Turkish. Common expressions were determined from the translation. It was decided to use the expressions closest to the original scale in the sections where there were differences. To determine the scale's content validity, the opinions of eight experts (Ph.D) were evaluated according to the Davis²² technique. Content validity index (CVI) (This result represents the mean of all individual item content validity ratio) of the scale was found 1.0. The scale was submitted to two experts in the English department and translated from Turkish to English. The two translations were in perfect agreement. It was decided that there was no ambiguity in meaning. Minor word changes were combined into a single form with the approval of the experts. After achieving a consensus among the experts, a pilot test was performed with five patients. The 5 patients in the pilot study were excluded from the sample group.

In this study, the term 'Providers' refers to nurses, and the term 'Clients' refers to patients receiving long-term care in inpatient care institutions. The original study reported that

clients can include those who receive care during acute care, long-term care, primary care, home and community health services, and health care providers, such as nurses and midwives, can be considered Providers.¹⁹ Our study results are also suitable for evaluating other healthcare providers, especially nurses.

Data Analysis

Data were analyzed with SPSS V23 and AMOS V24 (IBM Corp., Armonk, New York, USA). The analysis results were presented as mean $\pm$ standard deviation and median (minimum-maximum) for quantitative data and as frequency and percentage for categorical data. Multiple normality assumptions and the Shapiro-Wilk tests examined compliance with normal distribution.

Cronbach's α , item-total correlations (ITC) coefficient, and test-retest were utilized to test the reliability of the Clients' Perceptions of Providers' Cultural Competency (CPOPCC) Scale. Further, CFA and model fit indices were tested for construct validity.

The construct validity of the CPOPCC Scale was tested by using CFA. Considering the criteria required for CFA (outliers, skewed and depressed values, missing data, etc.), 6 participants were excluded from the study. This is because the data must be suitable for normal distribution to use ML. In the Multivariate normality test, the critical value was determined to be 24.868. While it is an excellent result that this value is below 10, studies have shown that up to 20 is generally not a problem.²³ To ensure normality, participants 31, 30, 46, 86, 114 and 186 were excluded from the study according to Mahalanobis distances. After excluding these participants, the assumption of multiple normality was ensured and ML was used as the calculation method in structural equation models. Model fit indices were used to determine whether the model was within the appropriate limits. In this context, Chi-Square/degrees of freedom (CMIN(χ^2)/DF), goodness-of-fit index (GFI), comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean squared residual (SRMR) were analyzed.

The reliability of the CPOPCC Scale was tested using Cronbach's α , ITC coefficient, and test-retest. Cronbach's alpha coefficient is a measurement that has been used to assess reliability for many years. Even though some studies establish that values higher than 0.7 are ideal, some researchers consider values under .70, but close to .60, as satisfactory.²⁴ The scale was administered to 15 patients at 2-week intervals. The literature suggests that an interval of 10-14 days is acceptable. Extending this period indicated in the literature may tend to decrease reliability.²⁴ Considering the discharge plans of hospitalized patients,

this period was appropriate for our study. In comparing test-retest scores, the Wilcoxon test was utilized for non-normally distributed data, and the interclass correlation (ICC) coefficient was used to examine the agreement. The scale's test-retest results are considered reliable because they do not show a significant difference, indicating invariance over time.²⁴ The significance level was determined as $P < .05$ in all results.

Ethical considerations

To adapt the CPOPCC scale to Turkish culture, permission was obtained by e-mail from the authors who developed the scale. Institutional permission was obtained from the institution where the study would be conducted (approval date: 15/04/2022; approval number: E-42884709-020). Ethical approval was obtained from the Kirsehir Ahi Evran University Medical Faculty Clinical Research Ethics Committee (approval date: 05/04/2022; approval number: 2022-07/61). The purpose of the study was explained to the patients and their informed consent was obtained. Ethics approval and information consent have been obtained from the families of the illiterate patients who stayed with them. In addition, permissions were obtained for the data obtained to be published in academic studies. Ethical principles and the Declaration of Helsinki were adhered to throughout the study.

RESULTS

Participants' Sociodemographic Characteristics

Study data were obtained from 224 patients. The mean age was 48.58 years (min: 21, max: 85), and the mean duration of hospitalization was 4.66 (min: 1, max: 17) days. 65.2% of the patients were female, and 87.5% were married. The demographic features of the patients are presented in Table 1.

Construct Validity

CFA analysis and model fit indices were utilized to determine the scale's construct validity. As a result of the first-level CFA performed with 23 items with a total of 3 factors, the path coefficients of items i3 and i4 were removed from the model because they were not statistically significant ($P > .05$). After item removal, 3 different modification procedures were applied. After removing these items, covariance-based modifications were made between the e1-e2, e7-e8, and e18-e19 errors as part of the necessary modifications in the repeated analysis. Accordingly, model fit indices were obtained as CMIN/DF=1.796, GFI=.883, CFI=.871, RMSEA=.06, SRMR=.076.

Table 1. The Demographic Features of The Patients (n=224)

Features	Mean±SD/ n	Median (min.- max.)/ %
Age	48.58±14	47 (21 - 85)
Sex		
Female	146	65.2
Male	78	34.8
Education		
Illiterate	24	10.7
Literate	25	11.1
Elementary school	34	15.2
Middle School	40	17.9
High school	61	27.2
Bachelor	40	17.9
Marital Status		
Married	196	87.5
Single	28	12.5
Profession		
Hausewife	97	43.3
Worker	47	21
Officer	39	17.4
Retried	18	8
Self-employment	23	10.3
Clinics		
Internal medicine	22	9.8
Surgical	50	22.3
Cardiology	43	19.2
Pulmonology	33	14.7
Urology	20	8.9
Orthopedics	56	25.1
Number of days hospitalized	4.66±3.17	4 (1 - 17)
Nationality		
Republic of Türkiye	141	62.9
Others	83	37.1

SD; Standard Deviation, Min; Minimum, Max; Maximum

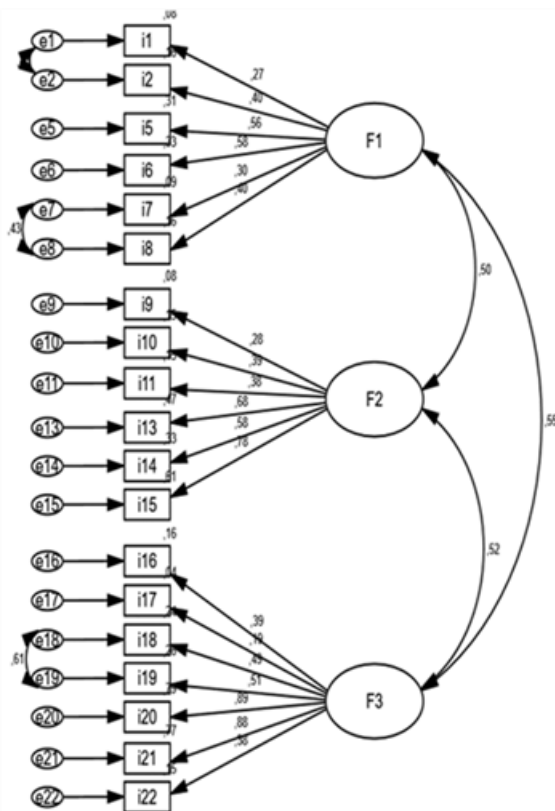
The fit indices obtained here are acceptable for the construct. However, when the ITC coefficients of each dimension of this construct are analyzed, it is necessary to remove items i12 and i23 from the scale since their ITC coefficients are lower than 0.2. After these four items were removed for these reasons, both the scale's construct validity and internal consistency were ensured. This way, there was no change in the original structure of the scale, the existing structure was preserved and four items unsuitable for the structure they were in were removed. As the removed items do not disrupt the scales' structures and the evaluations are made on a scoring rather than on an item, there is no drawback in removing these items. Stronger statistical results were obtained by removing these items. In the new results, CMIN/DF=1.647, GFI=.901, CFI=.91, RMSEA=.054, SRMR=.076 (Figure 1). All model fit indices were within acceptable limits and all path coefficients were significant (Table 2).

Table 2. Reliability Results of The Scale Items

Factors	Items	Mean	SD	Before i12 and i23 are removed ^ε			After i12 and i23 are removed [¥]		
				ITC	Item removed Cronbach's α	Cronbach's α	ITC	Item removed Cronbach's α	Cronbach's α
Factor 1	i1	2.34	1.13	.347	.544		.347	.544	
	i2	2.30	1.11	.445	.486		.445	.486	
	i5	3.19	0.56	.406	.535	.613	.406	.535	.613
	i6	2.63	0.98	.378	.522		.378	.522	
	i7	3.47	0.53	.232	.582		.232	.582	
	i8	3.14	0.67	.224	.582		.224	.582	
	i9	2.53	1.10	.231	.557		.296	.625	
	i10	1.81	1.09	.398	.474		.401	.564	
Factor 2	i11	3.14	0.51	.260	.542	.670	.294	.596	.685
	i12	1.78	1.36	.177	.084				
	i13	3.25	0.57	.402	.505		.439	.552	
	i14	3.11	0.53	.466	.494		.441	.555	
	i15	3.22	0.51	.472	.496		.472	.550	
	i16	2.54	1.05	.315	.636		.358	.671	
	i17	2.54	1.07	.235	.666		.221	.726	
	i18	3.19	0.43	.522	.602		.522	.630	
Factor 3	i19	3.24	0.51	.501	.597	.742	.520	.621	.758
	i20	3.10	0.60	.625	.561		.624	.586	
	i21	3.08	0.56	.588	.574		.593	.599	
	i22	3.39	0.55	.266	.637		.286	.666	
	i23	2.70	1.04	.194	.677				

ITC; Item-Total Correlations, SD; Standard Deviation, ^εGeneral Cronbach's α = .814, Tukey summability test ($F=110.34$; $P<.001$)

[¥]General Cronbach's α = .811, Tukey summability test ($F=136.63$; $P<.001$)



CMIN/DF=1,647, GFI=0,901, CFI=0,91, RMSEA=0,054, SRMR=0,076

Figure 1. Path Diagram of Confirmatory Factor Analysis

Reliability

To ensure the reliability of the scale items, ITC coefficient and Cronbach's α coefficients of the factors were analyzed. Cronbach's α coefficients of factor 1, factor 2 and factor 3 were 0.613, 0.670 and 0.742, respectively. When the ITC coefficients of the items were analyzed, i12 and i23 < .2 were found. These items were removed from the scale and recalculated and the correlation coefficient of all items reached >.2. ITC coefficients were evaluated within each dimension. In the final version of the scale, the Cronbach's α coefficients of the factors were .613, .685, .758, and the total Cronbach's α coefficient of the scale was .811, respectively. In this way, it was understood that the scale sub-dimensions and the whole scale were highly reliable. According to the Tukey summability test of the scale, the scale was not considered as summable ($F=136.633$; $P<.001$). Therefore, it was decided that each sub-dimension of the scale should be evaluated on its own (Table 3).

Test-Retest Findings

The results of the measurements of the scale at two different times are presented in Table 4. There is no significant difference between the mean scores of factor 1, factor 2, and factor 3 in the test-retest results ($P>.05$). There is also a statistically significant good agreement between the test-retest scores of all aspects ($P<.05$).

Findings related to scale score

Descriptive statistics of the scale score were analyzed, and the mean scores of the participants are presented in Table 4. The mean score of Factors 1 and 2 was 2.84, and the mean score of Factor 3 was 3.01. It is understood that the

higher the score obtained from the scale, the higher the cultural competence of the nurses. The participants in this study were determined to have above-average cultural competence.

Table 3. Confirmatory Factor Analysis Results of the Scale

Items	Factors	Before items removed			After items removed		
		β^1	β^2	<i>P</i>	β^1	β^2	<i>P</i>
i1	<--- F1	.277	1.15	.005	.275	1.15	.006
i2	<--- F1	.405	1.65	<.001	.404	1.66	<.001
i5	<--- F1	.559	1.15	<.001	.557	1.15	<.001
i6	<--- F1	.572	2.06	<.001	.579	2.10	<.001
i7	<--- F1	.302	0.59	<.001	.301	0.59	<.001
i8	<--- F1	.404	1.00		.401	1.00	
i9	<--- F2	.283	0.77	<.001	.284	0.77	<.001
i10	<--- F2	.395	1.08	<.001	.387	1.05	<.001
i11	<--- F2	.379	0.48	<.001	.383	0.48	<.001
i12	<--- F2	.249	0.84	<.001		Removed item	
i13	<--- F2	.674	0.96	<.001	.682	0.97	<.001
i14	<--- F2	.582	0.77	<.001	.575	0.76	<.001
i15	<--- F2	.782	1.00		.784	1.00	
i16	<--- F3	.392	1.00		.394	1.00	
i17	<--- F3	.189	0.49	.013	.188	0.48	.014
i18	<--- F3	.494	0.51	<.001	.491	0.51	<.001
i19	<--- F3	.513	0.63	<.001	.512	0.62	<.001
i20	<--- F3	.888	1.29	<.001	.888	1.29	<.001
i21	<--- F3	.877	1.19	<.001	.879	1.19	<.001
i22	<--- F3	.382	0.50	<.001	.384	0.50	<.001
i23	<--- F3	.249	0.63	.002		Removed item	

F; Factor, i; Item; β^1 ;Standardized beta, β^2 ;Unstandardized beta coefficient

Table 4. The Test-Retest Results and the Descriptive Statistics of the Scale Score

		Mean $\pm$ SD	Median (min. - max.)	Test	<i>P</i>	ICC (%95 CI) / <i>P</i>
Factor 1	Test	2.64 $\pm$.56	2.50 (1.83 – 3.83)	-.31	.757*	.75 (.28 - .919) / .006
	Retest	2.68 $\pm$.34	2.67 (2.17 – 3.17)			
Factor 2	Test	2.69 $\pm$.60	2.50 (2.00 – 4.00)	-.67	.502*	.79 (.375 - .93) / .003
	Retest	2.57 $\pm$.45	2.50 (1.33 – 3.33)			
Factor 3	Test	2.97 $\pm$.50	3.00 (2.14 – 4.00)	.44	.662*	.70 (.115 - .9) / .015
	Retest	2.92 $\pm$.35	2.86 (2.43 – 3.57)			
		Mean**	SD	Median	Minimum	Maximum
Factor 1		2.84	.50	2.92	1.50	4
Factor 2		2.84	.45	2.83	1.33	4
Factor 3		3.01	.42	3.00	1.57	4

SD; Standard Deviation, *Wilcoxon test, ICC (%95 CI): inter class correlation coefficient (%95 Confident Interval), **Mean of results obtained from all patients.
min; Minimum, max; Maximum

DISCUSSION

Many reasons such as unpreventable wars, droughts, climate changes and living conditions have confronted us with cultural diversity.² This situation necessitates differences in specific policies of countries receiving migrants.⁵ One of the most important of these policies is the provision and maintenance of health services. It is as

important to ensure the effective use of public services as it is to treat patients, provide their care, prevent repeated admissions, and keep individual health at an optimum level. One of the ways to achieve these goals is transcultural care. Nursing services are the most important health professionals that adopt. However, the competence of nurses should be evaluated with appropriate

measurements at certain times. There is currently no study on the validity and reliability of the scale developed to assess the cultural competence of nurses in the Turkish population.

This present study, which assessed nurses' cultural competencies in respect to nursing practices, firstly ensured linguistic equivalence. Based on the literature, the CVI score should be $>.80$.²⁵ This ratio being within reliable limits, we made the necessary adjustments according to the experts' recommendations without deleting any items. After the scale was translated from English to Turkish, its psychometric properties were evaluated in Turkish speaking patients.

CFA analysis was performed to determine the construct validity of the scale. I3 (I was provided an interpreter when I requested it) and i4 (I was provided with information and educational materials that were easy to understand in my preferred language) were excluded from the scale because their path coefficients were not significant. These results were thought to be due to the fact that all of the patients included in the study spoke Turkish.

Item 12 (I was connected with resources (e.g. health information, support, services, etc.) available in my community) and i23 (My spiritual and religious needs were met) were excluded because they were not within the model fit index limits. It is thought that i12 may have been perceived as similar to some items (e.g. i11 and i13), which may have led to this result. I23 may have been perceived as identical to i15. It may also be due to the fact that all patients participating in the study were Muslim and did not have negative thoughts about religious/spiritual care. All results of the remaining 19 items and 3 factors were significant and within the appropriate limits. In literature, fit indices should be higher than .90, RMSEA should be lower than .080, and χ^2/df should be lower than 5.^{26,27} Construct validity was supported according to the CFA results we obtained in our study.

Cronbach's α and ITC coefficient were examined to test the scale's reliability. To determine whether the items were discriminatory or not, ITC and item-subdimension total score correlations were examined. While $ITC > .2$ is recommended, approaching +1 is considered quite positive.^{28,29} Therefore, in the first stage, items with $< .2$ were removed from the scale and ensured that all items were within the appropriate and significant limits. All correlation coefficients were found to be significant at the $< .001$ level. Therefore, each item in the scale is essential. Similar results were obtained in the study in which the scale was developed, and the scale item with $< .2$ was excluded from the analysis.¹⁹ Similarly, the Philippines version of the

scale reported an ITC coefficient of $> .2$.¹⁷

Homogeneous distribution of Cronbach's α coefficients is important in determining the internal consistency of the scale. If deleted Cronbach's α all items in our study had values ranging between .48-.72. The Cronbach's α coefficients of the sub-dimensions were .61, .68 and .75. The total Cronbach's α value of the scale was .81. In addition, Cronbach's α coefficients in the Philippines version of the scale were reported as .87, .81, and .61 for the sub-dimensions and .89 for the overall instrument.¹⁷ These results were similar to the results of the original scale¹⁹ and Filipino version.¹⁷ In the literature, a value $<.40$ indicates that this value is not reliable, while a value above it is considered acceptable. Therefore, our scale items are within acceptable limits. Besides, it is stated in the literature that Cronbach's α varying between .60 and .80 indicates a fairly reliable scale and that Cronbach's α varying between .80 and 1.00 indicates a highly reliable scale.²⁰ Based on this information, it was revealed that our scale sub-dimensions and total value were highly reliable.

Another test of reliability in scale adaptation studies is time invariance. The scale is re-administered to the same participants within an appropriate period to demonstrate this. While the literature reports that repeated administration 2-3 weeks apart is sufficient, the most appropriate time is decided according to the study design.²⁴ In our study, the test-retest results that we performed two weeks apart indicated that the scale was time-invariant. For this, there should be no significant difference between the two measurements. In our study, no significant difference was found between the two measurements of all factors ($P > .05$). The results of the test-retest procedure indicate that the instrument's stability was good, as the ICC reached the recommended values $\geq .70$.³⁰ All three factors were above this value, indicating a good compliance.

These results showed that the scale, which was developed to assess the cultural competence of nurse of patients receiving care and psychometrically measured in the Turkish population, is valid and reliable for utilization. The scale has a comprehensive use in terms of assessing individuals receiving care both in the acute and long term as well as in and out of hospital. Therefore, it will contribute to the literature as an important measurement tool that will provide an advantage of use in these periods when our cultural diversity is increasing.

Limitations of the Study

Cultural adaptations vary in language, meaning, and lifestyle. This may prevent scales from producing the desired results in the society to which they are adapted. Based on adaptation studies, scale development studies

appropriate to one's culture and society can be planned later.

This study has several limitations. First, it was performed with patients only at one hospital. Second, some items were removed from the scale because they did not have values that were appropriate to the original scale. Third, the scale cannot be evaluated as a total score. Fourth, the foreign patients who participated in the study spoke enough Turkish to understand and express the questions. However, they may not have enough vocabulary to describe their more detailed and specialized care needs. Therefore, the study can be conducted with patients whose native language is different in the presence of an interpreter. In addition, all nurses in the hospital where the study was conducted were of Turkish nationality and had a similar cultural structure. This situation caused the clients to address a limited group in evaluating the care competence of nurses. Considering the increasing employment of foreign national providers in health services, there is a need for further studies in which both providers and clients can be compared. In this study, only nurses were considered as providers. It would be beneficial to conduct future studies with professional groups such as midwives, doctors, physiotherapists and dieticians. Another limitation of the study is that patients who received short-term care were evaluated. The long-term care of patients may affect their opinions. Therefore, it is recommended that future studies be conducted with patients who have received care for longer periods.

Finally, since this study used nonprobability sampling, only patients who volunteered to participate were included. This situation limits generalizability. Therefore, it is recommended that a multicenter study be conducted with patients of various cultural backgrounds.

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Supplementary Table 1. Clients' Perceptions of Providers' Cultural Competency (CPOPCC) Instrument

The scale can be filled in by the patient himself/herself, his/her family or the researcher, provided that it is stated in the demographic section. Please answer all questions completely.

		Strongly Agree	Agree	Disagree	Strongly Disagree	N/A
		4	3	2	1	0
Promotes Supportive and Meaningful Interactions	1. I was able to practice important routines and traditions related to my health.					
	2. I was comfortable sharing private and personal information with my provider.					
	3. I was provided an interpreter when I requested.*					
	4. I was provided with information and educational materials that were easy to understand in my preferred language.*					
	5. I was understood and comforted after speaking with my care provider.					
	6. I had enough time to talk to my provider.					
	7. I was treated with respect.					
	8. I was consulted regarding my care.					
Promotes Connections with Others	9. The provider acted on my behalf with others on the care team.					
	10. The provider was interested in knowing about my family and community.					
	11. My friends or family were involved in my care.					
	12. I was connected with resources (e.g. health information, support, services, etc.) available in my community.*					
	13. Other people I consider important participated in my care.					
	14. I was asked to provide input into my care					
	15. I received care that fit my beliefs, work, and family					
Acts on Behalf of Others	16. The provider worked with me to identify my needs and goals.					
	17. I am confident in my ability to get care for myself when needed.					
	18. My family and friends have access to resources to help me.					
	19. I can get help whenever I need it.					
	20. My provider understood my needs.					
	21. The provider was directly involved in my care.					
	22. The care I received helped me feel better and comfortable.					
	23. My spiritual and religious needs were met.*					

Note: It is suitable for use by healthcare professionals such as nurses, doctors, midwives, physiotherapists and dietitians as caregivers.

*Removed item

Supplementary Table 2. Hemşirenin Kültürel Yeterliğine İlişkin Hasta Algıları Ölçeği

Ölçek demografik bölümde belirtilmek kaydıyla hastanın kendisi, ailesi ya da araştırmacı tarafından doldurulabilir. Lütfen tüm soruları eksiksiz yanıtlayınız.

		Kesinlikle Katılıyorum	Katılıyorum	Katılmıyorum	Kesinlikle Katılmıyorum	Gerekli değil
		4	3	2	1	0
Destekleyici ve Anlamlı Etkileşimleri Geliştirir	1. Sağlığım ile ilgili önemli rutinleri ve gelenekleri uygulayabildim.					
	2. Hemşire ile özel ve kişisel bilgileri rahatça paylaştım.					
	3. İstedikimde bana bir tercüman sağlandı.*					
	4. Tercih ettiğim dilde anlaşılması kolay bilgi ve eğitim materyalleri sağlandı.*					
	5. Hemşire ile konuştuktan sonra anlaşıldım ve rahatladım.					
	6. Hemşire ile konuşmak için yeterli zamanım vardı.					
	7. Bana saygıyla davranıldı.					
	8. Bakımım ile ilgili bana danışıldı.					
Başkalarıyla İletişimi Geliştirir	9. Hemşire, bakım ekibindeki diğer kişilerle birlikte benim adıma hareket etti.					
	10. Hemşire ailem ve topluluğum hakkında bilgi sahibi olmakla ilgilendi.					
	11. Arkadaşlarım veya ailem bakımda yer aldı.					
	12. Toplumdaki mevcut kaynaklarla bağlantı kurdum (örneğin sağlık bilgisi, desteği, hizmetleri vb.)*					
	13. Önemli gördüğüm diğer insanlar bakımına katıldı.					
	14. Bakımım ile ilgili bilgi vermem istendi.					
	15. İnançlarım, işime ve aileme uygun bakım aldım					
Başkaları Adına Hareket Eder	16. Hemşire ihtiyaçlarımı ve hedeflerimi belirlemek için benimle birlikte çalıştı.					
	17. Gerektiğinde kendime bakabilme yeteneğime güvenirim.					
	18. Ailem ve arkadaşlarım bana yardımcı olacak kaynaklara erişir.					
	19. Ne zaman ihtiyacım olsa yardım alabilirim.					
	20. Hemşirem ihtiyaçlarımı anladı.					
	21. Hemşire doğrudan bakımım ile ilgilendi.					
	22. Aldığım bakım daha iyi ve rahat hissetmeme yardımcı oldu.					
	23. Manevi ve dini ihtiyaçlarım karşılandı.*					

Not: Bakım vericiler olarak hemşireler, doktorlar, ebeler, fizyoterapistler ve diyetisyenler gibi sağlık profesyonellerinin kullanımı için uygundur.

*Ölçekten çıkarılan maddeler

Everything'll be Fine Together! Peer Support in the Pandemic: A Mixed Methods Study

Her Şey Birlikte Güzel Olacak! Pandemide Akran Desteği: Bir Karma Yöntem Çalışması

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ABSTRACT

Objective: This study aims to examine the effects of a peer support program implemented for Health Sciences Faculty students who were isolated due to the COVID-19 pandemic on their levels of loneliness, stigma, and anxiety.

Methods: The study was conducted using a mixed-methods design between September 2020 and February 2022. The quantitative component included a sample of 66 students. Data were collected before and after the peer support program using sociodemographic information form, the UCLA Loneliness Scale, the Stigma Scale, and the Epidemic Anxiety Scale. Descriptive statistics and paired sample t-tests were used for data analysis in group comparisons. In the qualitative component, individual in-depth interviews were conducted with 11 students selected through purposive sampling in a face-to-face setting. The qualitative data were analyzed using thematic analysis, with themes and subthemes identified.

Results: The mean scores of the scales before and after the peer support program were, respectively, 15.18±2.57 and 14.56±2.48 for the UCLA Loneliness Scale, 38.69±11.00 and 35.66±11.47 for the Stigma Scale, and 50.50±13.36 and 46.24±15.69 for the Epidemic Anxiety Scale. After the program, there was a statistically significant decrease in the stigma and anxiety levels of the participants with peer support. The study identified two main themes: "Experiences related to the isolation process" and "Coping strategies during the isolation process."

Conclusion: It is recommended to develop global peer support education programs to support students' well-being in disaster situations such as pandemics.

Keywords: Anxiety disorders, COVID-19, nursing students, social isolation

ÖZ

Amaç: Bu çalışma, COVID-19 pandemisi nedeniyle izolasyona alınan Sağlık Bilimleri Fakültesi öğrencileri için uygulanan akran destek programının yalnızlık, damgalanma ve kaygı düzeyleri üzerindeki etkilerini incelemeyi amaçlamaktadır.

Yöntemler: Araştırma, Eylül 2020 ile Şubat 2022 tarihleri arasında karma yöntem deseniyle gerçekleştirilmiştir. Nicel bölümde örneklem 66 öğrenci ile oluşturulmuştur. Veriler, akran desteği programı öncesi ve sonrası sosyodemografik bilgi formu, UCLA Yalnızlık Ölçeği, Stigma Ölçeği ve Salgın Hastalık Kaygı Ölçeği ile toplanmıştır. Verilerin analizinde tanımlayıcı istatistikler ve gruplar arası karşılaştırmalarda eşleştirilmiş örneklem t testi kullanılmıştır. Nitel bölümde ise yüz yüze ortamda, amaçlı örneklem doğrultusunda 11 öğrenci ile bireysel derinlemesine görüşme yapılmıştır. Nitel veriler tematik analiz ile analiz edilerek tema ve alt temalar oluşturulmuştur.

Bulgular: Ölçeklerin akran destek programı öncesi ve sonrası ortalama puanları sırasıyla UCLA Yalnızlık Ölçeği için 15.18±2.57 ve 14.56±2.48, Stigma Ölçeği için 38.69±11.00 ve 35.66±11.47, Salgın Hastalık Kaygı Ölçeği için ise 50.50±13.36 ve 46.24±15.69 olarak bulunmuştur. Program sonrasında akran desteği alan katılımcıların damgalanma ve anksiyete düzeylerinde istatistiksel olarak anlamlı bir azalma tespit edilmiştir. Çalışmada iki ana tema belirlenmiştir: "İzolasyon sürecine ilişkin deneyimler" ve "İzolasyon sürecinde başa çıkma stratejileri."

Sonuç: Pandemi gibi afet durumlarında öğrencilerin iyilik halini desteklemek için küresel akran desteği eğitim programlarının geliştirilmesi önerilmektedir.

Anahtar Kelimeler: Anksiyete, COVID-19, hemşirelik öğrenciler, sosyal izolasyon



INTRODUCTION

Since the beginning of 2020, the COVID-19 disease has been seen as a public health crisis, and increased levels of stress, fear and anxiety have been observed in individuals during the outbreak and the increasing number of cases.¹ In the COVID-19 epidemic, social isolation has begun to be applied by physically separating people from each other for infection control. Social isolation causes a decrease in social relations, individuals feel trapped and isolated, and loneliness increases.² In a study conducted to evaluate the relationship between loneliness and psychological resilience of 109 university students who experienced the COVID-19 pandemic, it was found that students' anxiety about the future and their dissatisfaction with death in their family or close environment increased the feeling of loneliness, and those who wanted to socialize away from the feeling of loneliness.³ In a study conducted to evaluate the anxiety levels and coping methods among nursing students studying at a college in the Southern District of Israel, it was determined that 13.1% of the students had severe anxiety and 42.8% had a moderate anxiety prevalence. In the same study, it was determined that gender, lack of personal protective equipment and fear of infection were associated with higher anxiety scores, stronger flexibility and humor use were associated with significantly lower anxiety levels, and mental disconnection was associated with higher anxiety levels.⁴

Peer support programs are used as an effective method for all age groups such as decline in academic achievement, peer rejection, exclusion, bullying, loneliness, health problems (epidemic or chronic diseases, genetic disorders), habits (smoking, substance use, etc.), eating disorders, cultural differences, stress, elderly parents, suicide and work-related problems. In the COVID-19 pandemic, peer support program applications, which are established after the recovery of intensive care patients and social and emotional support of health personnel, are included in the literature.^{5,6} In the study conducted by Hope et al.⁷, was revealed that peer support was provided during the recovery process of intensive care patients, and it provided the improvement of the recovery, helped the patients to understand the health services better, and helped in the management of their recovery expectation. At the same time, when the literature was examined, no study was found in which the effect on symptoms was determined by providing peer support during the isolation process, especially for university students studying in the field of applied health. In this direction, the aim of the study is to examine the effect of the peer support program applied to the students of the Faculty of Health Sciences in the isolation process due to COVID-19 on loneliness, stigma

and anxiety levels during the isolation.

AIM

This study aims to examine the effects of a peer support program implemented for Health Sciences Faculty students who were isolated due to the COVID-19 pandemic on their levels of loneliness, stigma, and anxiety.

Research questions

- What are the levels of anxiety, stigma, and loneliness among students in isolation due to COVID-19 before participating in the peer support program?
- What are the levels of anxiety, stigma, and loneliness among students in isolation due to COVID-19 after participating in the peer support program?
- Is there a significant difference in the levels of anxiety, stigma and loneliness in students who are isolated after a peer support program?
- What are the experiences of students in isolation due to COVID-19 regarding the peer support program?

METHODS

Study design

In the research, mixed method design was used with the data obtained from the questionnaires applied to the participants. Quantitative data were obtained through questionnaires, in line with the single-group pre-test / post-test design, and information on students' loneliness, stigma, anxiety level and peer support. Qualitative data were analyzed by conducting individual in-depth interviews in order to analyze student experiences after the program.

The isolation decision of the students was taken according to the examination and PCR test results of the school physician and nurse. The isolation period was communicated to the researcher, who is a member of the COVID-19 team, by message. Students who were given a decision to be isolated, met the inclusion criteria and volunteered to participate in the research were randomly assigned to students who provided peer support in the social communication group. Students who provided peer support informed about the research, obtained consent from students who volunteered to participate in the research, and started the peer support program. During the study, the isolation period of the students varied between 10-14 days. The participant was given peer support throughout the quarantine from the first day of isolation.

Participants

In the quantitative part, students who were studying at a foundation university health sciences faculty in Istanbul between September 2020 and February 2022 and who had a positive COVID-19 PCR test or were admitted to the infirmary due to contact and decided to isolate were

invited to participate in the study (N=124). The sample consisted of 66 participants who met the inclusion criteria and volunteered formed the sample of the study (53.2%). After the quantitative data were collected, the participants who wanted to participate in the qualitative research were contacted and the data (n=11) were collected through individual in-depth interviews. The results of the analysis were reviewed with the participants to confirm that the researcher understood the participants' intent and to increase the reliability of the qualitative research process.

Peer support education program

A peer support training program has been established for students who will provide peer support in order to gain the necessary skills to cope with the isolation process by communicating appropriately with the students who are in contact / positive with COVID-19 during the pandemic process. This program was created by researchers with a PhD in Nursing Education and clinical experience in infection control. The prepared program was examined by two academicians and two clinicians. The content of the program included topics such as the COVID-19 disease, its treatment, infection control measures and prevention, the algorithm applied by the Ministry of Health and the university regarding the follow-up of students in isolation, the psychological effects of the pandemic and coping strategies, communication methods and peer support rules. Lecture, video presentation, use of printed materials such as brochures, flow charts, and question and answer were used as teaching methods. The duration of the training program is three days (total 9 hours (180 minutes / day). Ten students who are third year students of the Department of Nursing, who took the Mental Health and Diseases Nursing course and agreed to participate voluntarily. Continuing the information and support after the training for this purpose, a social communication group consisting of researchers and peer support students was formed.

Data collection

Quantitative Data

In the research, variables such as demographic information, student characteristics, loneliness, stigma and anxiety were evaluated by using questionnaires. These variables were measured at the beginning and end of the isolation in order to collect the quantitative data of the study.

Demographic information and student characteristics were evaluated with the information form created by the researchers.^{8,9}

Loneliness was measured with The University of California Los Angeles (UCLA) Loneliness Scale (ULS-8) Short Form.

The Turkish adaptation of the scale was made by Doğan et al.¹⁰ The scale consists of 8 items and is graded on a 4-point Likert scale as "Not at all Appropriate", "Not Appropriate", "Appropriate" and "Completely Appropriate". A high total score on the scale is evaluated in a way that suggests loneliness. The Cronbach alpha value of the scale is 0.72.¹⁰

The tendency to psychological stigma was measured by the Stigma Scale developed by Yaman and Güngör¹¹ in 2013. The scale consists of 22 items and is graded in a five-point Likert type as "I strongly disagree" and "I totally agree". The scale has four sub-dimensions as discrimination and exclusion, labeling, psychological health, and prejudice. There is no reverse scored item in the scale. The lowest score that can be obtained from the scale is 22, and the highest score is 110. It can be said that individuals with a score below 55 on the scale have a low tendency to stigmatize, and individuals with a higher score have a high tendency to stigmatize. The Cronbach's alpha value of the scale is 0.84.¹¹

Anxiety was measured with the Epidemic Anxiety Scale. The validity and reliability study of the scale was carried out by Sayar et al.¹² in 2020. The scale consists of 18 items and is graded as "Not at all suitable for me" and "Completely appropriate for me" on a five-point Likert scale. The scale has four sub-dimensions as epidemic, economic, quarantine and social life. The highest score that can be obtained from the entire scale is 90 and the lowest score is 18. In this direction, an increase in the total score of the scale is considered as an increase in epidemic disease anxiety. The Cronbach alpha value of the scale is 0.90.¹²

Qualitative Data

In order to collect qualitative data, after the peer support program, the students were asked "...how did you feel?", ".....how did you cope?" and ".....how did peer support relationship" individual in-depth interviews with 10-item open-ended questions were conducted. It was conducted by researchers trained in how to conduct semi-structured interviews. Individual in-depth interviews lasted approximately 40 minutes. It was explained that their requests regarding this interview (such as interrupting the interview, stopping the video recording, ending the interview) would be taken into account, and the confidentiality of the names of the participants and the data obtained would be ensured. The interviews were held at mutually determined times.

Data analysis

Quantitative Analysis

Statistical analyzes were performed with SPSS 25 (IBM SPSS Corp., Armonk, NY, USA). In the evaluation of the data, descriptive statistical methods (frequency-percentage,

arithmetic mean, standard deviation) and paired samples *t* test were used for comparisons between groups. Values with *P* < .05 at the 95% confidence interval in all analyzes were considered statistically significant.

Qualitative Analysis

Data from individual in-depth interviews were recorded. These records were transcribed by the researcher in the computer environment. Thematic analysis was performed to systematically group the interview data and themes were created.⁸ Thematic analysis was conducted by three experienced researchers who had conducted several qualitative studies.

Ethical consideration

This study was approved by the Yeditepe University Non-Interventional Clinical Research Ethics Committee (Date: 21.06.2021, Number: 202105042). Institutional permission was obtained (14092020). In addition, the participants were informed that participation in the research was voluntary. The data was kept anonymous and used for research purposes only.

RESULTS

The mean age of the students who provided peer support was 22.60 ± 0.69 , 100% of them were female and were in the third and fourth year of nursing. The mean age of the students participating in the study was 21.39 ± 1.47 years. Among them, 92.4% were female, 33.3% were in the second grade, and 48.5% were studying in the nursing department. Additionally, 90.9% did not have a chronic disease, 86.4% had a moderate economic status, and 60.6% lived with their families. Furthermore, 18.2% had lost a relative due to COVID-19, and 45.5% did not receive social support outside their family (Table 1).

When examining the students' situation during the isolation process, 65.2% tested positive for COVID-19. During the isolation period, 89.4% lived at home, 50% did not experience any disease-related symptoms, 27.2% reported joint pain and weakness, 18.2% had a cough, 12.1% had a sore throat and nasal congestion, 6.1% experienced a loss of smell and taste, 4.5% had a fever and mouth sores, and only 3% reported symptoms such as a headache (Table 2).

It was observed that 86.4% of the participants did not receive medical support during the isolation process, 18.2% felt anxious and hopeless, 77.3% did not experience any significant problems during the isolation period, and 9.2% faced priority issues related to symptom management and fear of contagion (Table 2).

The mean score of the students on the UCLA Loneliness Scale was 15.18 ± 2.57 before the peer support program and

Table 1. Distribution of students' sociodemographic characteristics (n=66)

Sociodemographic Characteristics		n	%
Age (Mean $\pm$ SD)	21.39 $\pm$ 1.47		
Gender	Female	61	92.4
	Male	5	7.6
Academic year	First Grade	14	21.2
	Second Grade	22	33.3
	Third Grade	18	27.3
	Fourth Grade	12	18.2
Department	Nursing	32	48.5
	Nutrition and Dietetics	16	24.2
	Physical therapy and rehabilitation	18	27.3
The state of having a chronic illness	Yes	6	9.1
	No	60	90.9
Economic state	Low	5	7.6
	Middle	57	86.4
	High	4	6.1
Residence	With family	40	60.6
	Dormitory	7	10.6
	Alone	8	12.1
	With friend	11	16.7
The state of having a chronic disease in the person with whom share the house	Yes	21	31.8
	No	45	68.2
Losing a relative due to COVID-19	Yes	12	18.2
	No	54	81.8
Frequency of communication with family	Rarely	20	30.3
	Often	28	42.4
	Always	18	27.3
Existence of social support outside the family	Yes	36	54.5
	No	30	45.5

SD; Standard deviation

14.56 ± 2.48 after the program. There was no statistically significant difference between the UCLA Loneliness Scale scores measured before and after the program ($t=1.882$; $P=.064$) (Table 3).

Before the peer support program, the students' total score on the Stigma Scale was 38.69 ± 11.00 . The sub-dimensions were as follows: discrimination and exclusion 7.18 ± 2.89 , labeling 9.33 ± 3.50 , psychological health 8.43 ± 3.35 , and prejudice 13.74 ± 4.01 . After the program, the students' total score on the Stigma Scale was 35.66 ± 11.47 , with the following sub-dimensions: discrimination and exclusion 7.12 ± 2.36 , labeling 8.80 ± 3.83 , psychological health 7.62 ± 3.18 , and prejudice 12.12 ± 3.95 . A statistically significant difference was found in the total Stigma Scale score ($t=2.009$; $P=.049$) and the sub-dimension of prejudice ($t=3.464$; $P=.001$) between the measurements taken before and after the program (Table 3).

Table 2. The situation of students in the isolation process (n=66)

Interview form		n	%
Reason for isolation	COVID-19 positive	43	65.2
	Contacted	23	34.8
Place of residence during isolation	Home	59	89.4
	Dormitory	7	10.6
Presence of symptoms during isolation	Joint pain and fatigue*	18	27.2
	Cough*	12	18.2
	Sore throat and nasal congestion*	8	12.1
	Loss of smell and taste*	4	6.1
	Fever and mouth sore*	3	4.5
	Headache*	2	3
	No symptoms experienced	33	50
Status of receiving medical support	Yes	9	13.6
	No	57	86.4
Mood during isolation	Comfortable	27	40.9
	Anxious-hopeless	12	18.2
	Tired	27	40.9
Problems in the isolation	Symptom management*	6	9.2
	Quarantine period and fear of contagion*	6	9.2
	No problem occurred	51	77.3

* More than one option ticked

Before the peer support program, the mean total score on the Epidemic Anxiety Scale was 50.50 ± 13.36 , with the following sub-dimensions: epidemic 15.74 ± 5.61 , economic 5.22 ± 1.89 , quarantine 13.19 ± 3.92 , and social life 16.33 ± 4.86 . After the program, the mean total score on the Epidemic Anxiety Scale was 46.24 ± 15.69 , and the sub-dimensions were as follows: epidemic 13.31 ± 6.57 , economic 5.50 ± 2.38 , quarantine 12.31 ± 4.97 , and social life 15.10 ± 5.16 . A statistically significant difference was found in the Epidemic Anxiety Scale ($t=2.837$; $P=.006$), and the sub-dimensions of epidemic ($t=4.344$; $P<.001$) and social life ($t=2.107$; $P=.039$) measurements taken before and after the program (Table 3).

In the qualitative part, two main themes and six sub-themes were formed as a result of the content analysis of the individual in-depth interviews with the students. The first main theme, "Experiences Related to the Isolation Process", was examined under three sub-themes: "Experiences with COVID-19", "Psychological Experiences", and "Experiences Related to the Educational Process". The second main theme, "Coping Strategies During the Isolation Process", was examined under three sub-themes: "Social Support", "Family Support", and "Peer Support" (Table 4).

Table 3. Comparison of the loneliness, stigma and epidemic anxiety scale mean scores of students before and after the peer support program (n=66)

Measurements	Before the Peer Support Program (Mean $\pm$ SD)	After the Peer Support Program (Mean $\pm$ SD)	Test value	P**
UCLA Loneliness Scale	15.18 $\pm$ 2.57	14.56 $\pm$ 2.48	1.882*	.064
Stigma Scale	38.69 $\pm$ 11.00	35.66 $\pm$ 11.47	2.009*	.049**
<i>Discrimination and exclusion</i>	7.18 $\pm$ 2.89	7.12 $\pm$ 2.36	.133*	.894
<i>Labeling</i>	9.33 $\pm$ 3.50	8.80 $\pm$ 3.83	1.117*	.268
<i>Psychological health</i>	8.43 $\pm$ 3.35	7.62 $\pm$ 3.18	1.989*	.051
<i>Prejudice</i>	13.74 $\pm$ 4.01	12.12 $\pm$ 3.95	3.464*	.001**
Epidemic Anxiety Scale	50.50 $\pm$ 13.36	46.24 $\pm$ 15.69	2.837*	.006**
<i>Epidemic</i>	15.74 $\pm$ 5.61	13.31 $\pm$ 6.57	4.344*	<.001**
<i>Economic</i>	5.22 $\pm$ 1.89	5.50 $\pm$ 2.38	-.991*	.325
<i>Quarantine</i>	13.19 $\pm$ 3.92	12.31 $\pm$ 4.97	1.475*	.145
<i>Social life</i>	16.33 $\pm$ 4.86	15.10 $\pm$ 5.16	2.107*	.039**

*Paired samples t test ** $P<.05$, SD; Standard deviation

DISCUSSION

This study aimed to examine the effects of the peer support program applied to students in isolation due to COVID-19 on their loneliness, stigma and anxiety levels. The findings showed that the peer support program reduced the stigma and anxiety levels of the students, they received support during the illness-related processes in isolation due to COVID-19, and improved their coping attitudes and skills in this process. In addition, the peer support program increased their satisfaction with the education process. The results are discussed under two main themes.

Experiences with the isolation process

In the literature, the signs and symptoms that occur in the long term due to COVID-19; fatigue^{13,14}, shortness of breath¹⁵, chest pain¹⁴, joint and muscle pain¹⁶, insomnia¹⁷. In the study, it was determined that most of the students were isolated due to COVID-19 positive, they lived at home during the isolation period, they did not experience any symptoms related to the disease, and those who did generally experienced joint pain and fatigue.

In related studies, it has been stated that many people are afraid of contracting the disease of COVID-19. It has been observed that this fear is related to being infected or infecting others.¹⁸ Cervin et al.¹⁹ in his study with young people without anxiety disorders and psychiatric disorders, it was stated that those who are afraid of getting sick think that they may constantly be contagious, and as a result, they often go to the doctor or use their own medication. It

Table 4. Analysis of individual in-depth interviews after the peer support program of the students (n=11)

Themes	Subthemes	Example of description
Experiences related to the isolation process	Experiences with COVID-19	".....Since I have never faced such an event before, it felt like a very difficult and never-ending process. We never went out as a family because we were very scared when it first came out. We got caught though. My brother and I have been through a lot. Our fever was high for 3 days and the bone pains got worse. We tried not to use any other medication other than painkillers. Later, it infected our parents as well. It was very difficult to go through such an illness as a family and to see my family in this way." (Participant 6) ".....Two days after me, my mother and brother also tested positive. It was very sad and difficult to see my family suffer. I blamed myself for their suffering." (Participant 9)
	Psychological experiences	".....Even though I was in contact, I had to stay at home. So I felt left out and alone. I was very happy when the isolation was over." (Participant 2) "..... At the end of the process, I was very afraid that people would react when I returned." (Participant 5) ".....We went to our nursing internships during the covid period, and at the end, it was canceled when the cases increased. In this process, my friends were staying away from me because they were afraid of me because I was working at the hospital. I was trying to isolate myself so that if it got into me, it wouldn't infect my family. This made me very sad. During the period when Covid 19 was positive, staying at home for 2 weeks was very depressing. I missed walking outside, and sometimes I was crying with anger. It was a process where I was very worn out psychologically." (Participant 6) ".....My positivity period coincided with my full intern internship. Since I have been in contact with many patients, I wonder if I infected my patients, the fear made me very sad." (Participant 9)
	Experiences related to the educational process	".....I was very worried about how we will take the exams, how this process will go." (Participant 1) ".....Because I was positive, I would not be able to attend the classes, I was afraid of being behind and incomplete in the subjects and not being successful in the exams. I was very worried about the prolongation of this process and not knowing when I would turn negative." (Participant 7)
	Social support	".....My friends were with me during this process and they reduced my anxiety level." (Participant 3) "..... Our social life has been severely restricted. I think the addiction to social media has increased even more. Because people had to provide communication and interaction in this way. I also tried to keep in touch with my friends and relatives over the phone on social media as much as possible." (Participant 6)
Coping strategies during the isolation process	Family support	".....My family was also COVID positive. We got through this process well by keeping in touch with each other." (Participant 3) ".....I think I am lucky. My family was with me during my illness. They did their best to make me not feel alone psychologically. We caught a tighter bond because we are all at home all the time. If I had lived alone, I'm sure I would have gotten through this process more difficult. Basically, I had very little energy in activities such as cooking and cleaning. But since my family was with me, I did not have much difficulty." (Participant 6)
	Peer support	".....We didn't just talk about the disease, we also discussed lessons, exams, study methods. My peer counselor told me about study methods, and it helped me calm down." (Participant 1) ".....My peer counselor made me feel like I wasn't alone by asking about my daily situation. It relieved my concerns about school and internship absenteeism. It made me feel better." (Participant 3) ".....My peer counselor often asked me how I was doing. She constantly questioned how I was feeling and whether I needed anything. Apart from that, we talked about my general lifestyle, my psychological state, how I was affected not only by the disease but also by other events in life. She also gave advice on study methods. It was very good for me to talk, to be in communication, to feel that I don't care. I was very satisfied." (Participant 6) ".....I was able to get rid of some of my worries thanks to the support of my peer counselor. The fact that my counselor gave examples from his experiences made me realize that I am not the only one who has experienced this situation and I did not feel alone." (Participant 7) ".....The support I received at that time was very productive for me. Because we were put in isolation for the first time, and we did not know how the process would work. My peer counselor called me every day and explained the process and helped me to overcome this process in the easiest way. Of course, he is also a student. I won't forget your help with the lesson." (Participant 8) ".....It felt good to have friends looking for me and asking me to distract me from these sick thoughts for a bit." (Participant 9)

has also been reported that the fear of COVID-19 negatively affects individuals' stress levels and life satisfaction, and that the fear of contamination can adversely impact daily life by triggering obsessive-compulsive symptoms.²⁰ In the study, it was seen that the participants had the most primary problems related to symptom management and fear of contagion, and they received peer support on these issues.

Coping strategies during the isolation

Mandatory isolation measures brought by the COVID-19 pandemic can lead to difficulties in socialization, peer communication and establishing meaningful relationships, which are very important in early adulthood according to personality development theories. Peer support programs are seen as a basic healing service for people with mental health problems worldwide, especially during the pandemic period, especially in problems such as loneliness, stigma and anxiety and can be applied as a patient-centered approach in some primary care settings.²¹

Loneliness, which is a negative subjective experience that occurs when an individual perceives that social relationships and interactions are inadequate, emerges as a potential consequence of the mandatory state-imposed quarantine to limit the spread of COVID-19.²² In the COVID-19 pandemic, loneliness is higher among young people compared to older adults.²³ In the literature, it has been stated that at least 38-50% of young people between the ages of 18-24 experience high levels of loneliness during mandatory quarantine²² and that women are more likely to experience loneliness than men.²⁴ In addition, it has been shown that the feeling of loneliness is higher among university students, especially after the mandatory quarantine measures applied during the pandemic.²⁴ The research showed that peer support had no effect on the loneliness level of the participants. It can be thought that this situation is since most of the students live with their family or friend, and the feeling of loneliness is less. As a matter of fact, the loneliness levels of the students were found to be below the average before and after the program.

Another problem brought by the COVID-19 pandemic is the stigma applied to individuals who are sick or suspicious. Stigma causes anxiety, fear, lowers self-esteem and impairs the quality of life of stigmatized people.²⁵ It is observed that individuals quarantined at home often experience negative emotions such as anxiety and depression, avoidance of seeking medical help, and social phobia due to feelings of guilt towards family members or other people. It has been stated that peer support programs used to prevent the spread of attitudes and behaviors related to stigma were provided especially through social media during the COVID-

19 pandemic, but they were not sufficient.²⁶ Tasdelen et al.²⁷, it was reported that support from friends and family members is effective in coping with depression, stress, and anxiety. The findings of our study are in parallel with the literature and show that the peer support program reduces stigma and prejudice. Peer support is thought to be an effective model for developing strategies to cope with negative emotions and being a role model.

It is known that physical distance and isolation measures and restrictions applied due to the COVID-19 pandemic significantly threaten the mental health of individuals.²⁸ This leads to consequences such as stress, anxiety and alienation from peers among people.²⁹ In a study conducted in the USA, it was stated that the anxiety and worry that increased in the first stage of the epidemic increased three times more in the later stages of the epidemic compared to the previous period.³⁰ In another similar study in the literature, it was revealed that the level of anxiety about the COVID-19 pandemic was high.³¹ Therefore, the management of the anxiety caused by the isolation measures taken during the pandemic period has an important place. The American Psychological Association stated that anxiety can be reduced by creating a sense of normalcy and this can be achieved through social networks.³² The literature states that peer support functions as a social network and contributes to improvements in self-esteem, anxiety, depression, stress, burnout, loneliness, and overall mental health.³³ The results of our study showed that peer support reduces anxiety about epidemic diseases in the COVID-19 pandemic. Especially after peer support, a statistically significant difference was found in the epidemic and social life measurements, which are sub-dimensions of the epidemic anxiety scale.

The COVID-19 pandemic has also deeply impacted students' educational processes and psychosocial well-being, with increased levels of anxiety and stress due to isolation and uncertainty.³⁴ In this context, the peer support program implemented has reduced students' levels of stigma and anxiety, and positively influenced their satisfaction with the educational process. Findings in the literature indicate that peer support enhances motivation in learning processes and supports academic success, which aligns with the results of this study.³⁵ Within the program, the guidance and support provided by peer counselors have alleviated students' concerns about lessons, exams, and study methods, enabling them to work in a more organized and motivated manner. This has contributed to an improvement in both their psychological well-being and educational satisfaction. The multifaceted benefits of peer support highlight its role as an essential

tool in promoting more effective student participation in education during crisis periods such as the pandemic. These findings emphasize the importance of integrating social support interventions into educational programs and provide effective strategies for similar situations in the future.

Limitations

The fact that the research was conducted during the COVID-19 period, which is a specific time period, limits the comparability of the results with the results in different periods due to the variability of the conditions during the pandemic period. Another limitation of the study is that the sample size is limited and that it is based on data from only one institution. This indicates that the findings may be specific to students at this institution and may limit their generalizability. Studies conducted in different educational institutions and different disciplines may reveal different results.

Research findings show that students who are taken into isolation have the most problems in coping with the disease; revealed that stigma and anxiety decreased with the peer support program and provided support in the treatment and education processes. It is important to implement support tools to help mitigate the harmful effects of the fight against the COVID-19 pandemic and maintain student well-being. In this context, it is recommended to use the peer support program as a valid and reliable model when there is a crisis period affecting large masses.

Ethics Committee Approval: Ethics committee approval was obtained from Yeditepe University Ethics Committee (Date: 21.06.2021, Number: 202105042)

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Determination of Psychological Capital Levels of Nurses

Hemşirelerin Psikolojik Sermaye Düzeylerinin Belirlenmesi

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ABSTRACT

Objective: In the study, it was aimed to determine the psychological capital levels of nurses.

Methods: The descriptive study was conducted with 138 nurses working in a training and research hospital. Data were collected with Personal Information Form and Psychological Capital Scale. Descriptive analyses, independent groups t test, Anova test and Pearson correlation test were used in the analysis of data.

Results: The total score of the Nurses' Psychological Capital Scale was found to be 105.11±12.97. When looking at the sub-dimensions of the scale, the highest average score was calculated as "self-efficacy" score average of 28.06±4.81, and the lowest average score was calculated as "optimism" score average of 23.18±3.39. As a result of the study, a statistically significant difference was found between positive psychological capital level and marital status, total professional years, working time in the institution, number of shifts per month, department worked, working status, weekly working hours and working style ($P < .05$).

Conclusion: This study revealed that nurses' psychological capital levels were generally high. The highest score was observed in the self-efficacy sub-dimension, while the lowest was observed in the optimism sub-dimension. Significant relationships were found between psychological capital and some demographic and professional variables. These findings show that regular monitoring of nurses' psychological capital and consideration of the influencing factors can contribute to improvements in areas such as workload management, working hours and shift planning. The findings obtained can provide significant contributions in terms of nursing management, human resources practices and vocational training programs.

Keywords: Nursing, motivation, positive, psychology, mental health

ÖZ

Amaç: Çalışmada, hemşirelerin psikolojik sermaye düzeylerinin belirlenmesi amaçlanmıştır.

Yöntemler: Tanımlayıcı tipte olan çalışma, bir eğitim araştırma hastanesinde çalışmakta olan 138 hemşire ile yapılmıştır. Veriler, "Kişisel Bilgi Formu ve Psikolojik Sermaye Ölçeği" ile toplanmıştır. Verilerin analizinde tanımlayıcı analizler, bağımsız gruplarda t testi, Anova testi ve Pearson korelasyon testi kullanılmıştır.

Bulgular: Hemşirelerin Psikolojik Sermaye Ölçeği Toplam puan ortalaması 105.11±12.97 olarak bulunmuştur. Ölçek alt boyutlarına bakıldığında en yüksek puan ortalaması öz-yeterlilik alt boyutunda olup puanı ortalaması 28.06±4.81, en düşük puan ortalaması iyimserlik alt boyutunda ve puanı ortalaması 23.18±3.39 bulunmuştur. Çalışma sonucunda olumlu psikolojik sermaye düzeyi ile medeni durum, meslekte toplam çalışma yılı, kurumda çalışma süresi, aylık nöbet sayısı, çalışılan bölüm, çalışma statüsü, haftalık çalışma saati ve çalışma biçimi açısından istatistiksel açıdan anlamlı farklılık saptanmıştır ($P < .05$).

Sonuç: Bu çalışma, hemşirelerin psikolojik sermaye düzeylerinin genel olarak yüksek olduğunu ortaya koymuştur. En yüksek puan öz-yeterlilik, en düşük ise iyimserlik alt boyutunda gözlenmiştir. Psikolojik sermaye ile bazı demografik ve mesleki değişkenler arasında anlamlı ilişkiler saptanmıştır. Bu bulgular, hemşirelerin psikolojik sermayesinin düzenli izlenmesinin ve etkileyen faktörlerin göz önünde bulundurulmasının; iş yükü yönetimi, çalışma saatleri ve nöbet planlaması gibi alanlarda yapılacak iyileştirmelere katkı sağlayabileceğini göstermektedir. Elde edilen bulgular, hemşirelik yönetimi, insan kaynakları uygulamaları ve mesleki eğitim programları açısından önemli katkılar sunabilir.

Anahtar Kelimeler: Hemşirelik, motivasyon, pozitif, psikoloji, ruh sağlığı

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INTRODUCTION

Psychological capital is a construct composed of various features related to the emergence and development of individuals' positive qualities, and it consists of four subcomponents: hope, optimism, self-efficacy, and resilience.^{1,2} Hope reflects the self-motivation required to achieve goals even when faced with challenges. Optimism involves the perception and belief in a positive outlook toward both the present and the future. Self-efficacy refers to an individual's self-confidence in their duties to carry out tasks and cope with challenges. Resilience denotes the capacity to withstand difficulties and setbacks.³ Psychological capital aims to promote employees' success and well-being⁴, and individuals with high psychological capital are known to report lower levels of job stress.⁵ Studies conducted with nurses have demonstrated that psychological capital has positive effects on variables such as job satisfaction, work engagement, performance, job-related happiness, coping with difficulties, burnout prevention, and both physical and psychological well-being.^{2,6-9}

Psychological capital is significantly associated with the individual's demographic characteristics and both internal and external environmental conditions. Studies have shown that psychological capital tends to be higher among males, individuals with undergraduate degrees, experienced employees, and healthcare professionals in managerial positions.^{1,7,10-12} However, Tang et al.¹³, in their study conducted with nurses, found no significant relationship between psychological capital and gender, marital status, employment status, or income level. These findings suggest that psychological capital is a complex construct influenced by multiple factors.

Nursing is a profession based on communication and assistance with individuals. In this regard, strong psychological capital serves as an effective resource for nurses in coping with the challenges they face. Psychological capital not only enhances nurses' performance, motivation, and service quality but also, when combined with a healthy work environment, strengthens work engagement.^{11,14} Elderly cancer patients who receive care from nurses with high psychological capital report higher levels of satisfaction. In addition, work engagement has been found to mediate the relationship between psychological capital and patient satisfaction.¹⁵ Furthermore, another study suggests that improving environmental factors influencing psychological capital levels may enhance work engagement.¹¹ The fact that psychological capital can be developed and managed through training enables it to be enhanced through

targeted interventions. Therefore, assessing the level of psychological capital among nurses is important for guiding future research and forming a foundation for evidence-based initiatives. Strengthening nurses' psychological capital is of great importance for enabling them to cope effectively with the challenges they face in their professional practice. Psychological capital is not only a key factor directly influencing nurses' mental health, but also plays a decisive role in job satisfaction, professional motivation, and the quality of patient care. Therefore, assessing the psychological capital levels of nurses working in healthcare institutions is considered a vital step toward enhancing both their professional performance and the quality of care delivered to patients. This approach may contribute significantly to the healthcare system by providing a healthier and more productive work environment for nurses.

Strengthening nurses' psychological capital not only supports their individual and professional development but may also contribute to improving the organizational structure of healthcare institutions. In this context, it may be important to plan internal rotations and other institutional changes based on nurses' levels of psychological capital.

AIM

This study aims to determine the psychological capital levels of nurses.

Research questions/hypothesis

The following questions were sought in this study:

- What are the psychological capital levels of nurses?
- Are there significant differences between the introductory characteristics of nurses (gender, marital status, age, years of service, title, education level) and the level of psychological capital?

METHODS

Features and Place of The Study

The study was conducted at a public university hospital located in the province of Bolu between November 1, 2021, and February 28, 2022, during the global COVID-19 pandemic.

Participants

The study population comprised 310 nurses from a public university hospital (total N = 391), excluding those on sick or maternity leave during the data collection period. The sample size was calculated using the GPower 3.1.9.4 software.¹⁶ Independent samples t-test was selected as the statistical analysis to compare the means of two independent groups. Regarding the effect size, the analysis

by Kuşçu Karatepe et al.⁷ concerning “nurses' psychological capital levels in relation to their working status” utilized mean and standard deviation values, yielding an effect size of 0.636.⁷ As a result of the calculation conducted with a significance level of $\alpha = 0.05$, a power of 0.95, and a two-tailed test, the required sample size was determined to be 132. To account for potential data loss due to incomplete or missing surveys, 138 participants were included in the study. Participants were selected using the simple random sampling method.

Data Collection Tools

Personal Information Form: Based on the scientific literature, the researchers developed a 14-item form to collect personal and professional information about nurses.^{2,7,17}

Psychological Capital (PsyCap) Measure: The scale, originally developed by Luthans et al.¹⁸, was adapted into Turkish by Çetin and Basım.¹⁹ It consists of a total of 24 items distributed across four sub-dimensions: self-efficacy, hope, optimism, and psychological resilience. The scale is a 6-point Likert-type instrument. Higher scores indicate a higher level of psychological capital. The sub-dimensions of the scale are measured by the following items: optimism (items 1, 9, 11, 14, 18, 19), psychological resilience (items 5, 7, 8, 10, 13, 22), hope (items 2, 6, 12, 17, 20, 24), and self-efficacy (items 3, 4, 15, 16, 21, 23). Items 1, 8, and 11 are reverse-scored. The total Cronbach's alpha coefficient of the adapted scale was reported as 0.91. The coefficients for the sub-dimensions were 0.67 for optimism, 0.81 for hope, 0.68 for psychological resilience, and 0.85 for self-efficacy.¹⁹ In the present study, the total Cronbach's alpha coefficient was found to be 0.86, with sub-dimension values of 0.63 for optimism, 0.74 for hope, 0.78 for psychological resilience, and 0.87 for self-efficacy (Table 1).

Data Collection Method

Survey forms were initially administered online due to the global pandemic. Participation was limited to individuals who read the study information and selected the checkbox indicating “I agree to participate in the study.” As the pandemic situation improved during the data collection period, the remaining data were gathered through face-to-face interviews. Prior to data collection, nurses were provided with detailed information about the study.

Statistical Analysis

The data were analyzed using the SPSS version 26 (IBM SPSS Corp., Armonk, NY, USA). To assess the distribution of the data, skewness and kurtosis values between -2.5 and +2.5 were considered acceptable.^{20,21} It was determined

that the skewness and kurtosis values indicated a normal distribution, and the histogram also supported the assumption of normality. Descriptive statistical analyses (frequency, percentage, mean, standard deviation), the independent samples t-test, one-way ANOVA, and Pearson correlation test were used to analyze the data. A p-value of <.05 was considered statistically significant.

Ethical Considerations

Ethical approval for the study was obtained from the Clinical Research Ethics Committee of Bolu Abant İzzet Baysal University (Date: 04.05.2021, Decision No: 2021/121). Written permission was also obtained from the institution where the research was conducted. Informed consent was obtained in writing from all participants by having them complete the informed consent form.

RESULTS

Table 1 shows the results of the reliability analysis of the psychological capital scale, skewness and kurtosis values, standard deviation and data related to the scale and its sub-dimensions. The overall Cronbach's alpha value of the Psychological Capital Scale used in the study was determined to be 0.86. The Cronbach's alpha values for the sub-dimensions were as follows: self-efficacy 0.87, hope 0.74, psychological resilience 0.78, and optimism 0.63 (Table 1).

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Table 2 shows the comparison of participants' demographic characteristics with the mean scores of the Psychological Capital Scale and its sub-dimensions.

The mean age of the nurses was 30.00±7.43 years; 57.2% (n=79) were married, and 71.7% (n=99) held a bachelor's degree. The average total duration of professional experience was 10.00±7.03 years, while the average duration of employment at the current institution was 6.00±4.80 years. Among the participants, 42% (n=58) were working in intensive care units, and 62.3% (n=86) were employed as ward nurses. It was found that 37% (n=51) of the nurses worked more than 60 hours per week, and 30.4% (n=42) reported having 6–10 shifts per month. Additionally, 68.1% were engaged in shift work. A majority of the nurses (68.8%) reported having chosen their profession willingly, and 75.4% were satisfied with communication among colleagues (Table 2).

Table 1. The results of the reliability analysis of the Psychological Capital Scale and its sub-dimensions and normal distribution (n=138)

Scale and Sub-Dimensions	Min-Max	$\bar{x} \pm SS$	Standard Error	Skewness	Kurtosis	Cronbach's Alpha
Psychological Capital	47-136	105.11 $\pm$ 12.97	1.10	-0.801	2.390	0.86
Self-efficacy	9-36	28.06 $\pm$ 4.81	0.41	-0.546	0.730	0.87
Hope	12-36	27.65 $\pm$ 3.93	0.33	-0.643	1.615	0.74
Optimism	13-31	23.18 $\pm$ 3.39	0.28	-0.223	0.224	0.63
Resilience	12-33	26.21 $\pm$ 3.55	0.30	-1.082	2.223	0.78

Min; Minimum, Max; Maximum, $\bar{x}$; Mean, SD; Standard Deviation

According to Table 2, no statistically significant differences were found between the Psychological Capital Scale and its subdimensions in relation to gender, educational status, willingness to choose the profession, satisfaction with communication among colleagues, or willingness to participate in psychological activities ($P > .05$). However, a significant difference was observed between the self-efficacy subdimension and gender ($P < .05$) (Table 2).

When the age variable was evaluated, the psychological capital levels of nurses in the 20–29 age group (100.64 $\pm$ 11.77) were found to be significantly lower than those of nurses in the 30–39 and 40–59 age groups ($F(2)=8.073$; $P<.01$). Married nurses had significantly higher psychological capital levels compared to single nurses ($t(136)= -2.985$, $P<.01$).

Table 2. Comparison of participants' demographic characteristics with the mean scores of the Psychological Capital Scale and its sub-dimensions (n=138)

Descriptive Characteristics Test; df; P; Post Hoc	n (%)	Psychological Capital $\bar{x} \pm SD$	Self-efficacy $\bar{x} \pm SD$	Hope $\bar{x} \pm SD$	Optimism $\bar{x} \pm SD$	Resilience $\bar{x} \pm SD$
Age $\bar{x} \pm SD=30.00 \pm 7.43$						
20-29 years (1)	65(47.1)	100.64 $\pm$ 11.77	26.43 $\pm$ 4.70	26.70 $\pm$ 3.57	22.18 $\pm$ 3.27	25.32 $\pm$ 3.64
30-39 years (2)	45(32.6)	109.35 $\pm$ 11.83	29.71 $\pm$ 3.96	28.60 $\pm$ 4.15	24.11 $\pm$ 3.35	26.93 $\pm$ 3.14
40-59 years (3)	28(20.3)	108.67 $\pm$ 14.34	29.21 $\pm$ 5.23	28.32 $\pm$ 4.00	24.03 $\pm$ 3.20	27.10 $\pm$ 3.61
Test; df; P		F=8.073; 2; .001** 1<2-3	F=7.881; 2; .001** 1<2-3	F=3.725; 2; .027* 1<2	F=5.732; 2; .004** 1<2-3	F=4.012; 2; .020* 1<2-3
Gender						
Female	126(91.3)	105.53 $\pm$ 13.07	28.34 $\pm$ 4.74	27.73 $\pm$ 3.96	23.18 $\pm$ 3.46	26.26 $\pm$ 3.58
Male	12(8.7)	100.75 $\pm$ 11.40	25.08 $\pm$ 4.75	26.83 $\pm$ 3.66	23.25 $\pm$ 2.66	25.58 $\pm$ 3.34
Test; P		MWU=575; Z=-1.369 .171	MWU=478 Z=-2.105 .035*	MWU=676; Z=-0.607; .544	MWU=725; Z=-0.235; .814	MWU=667; Z=-0.674; .500
Educational status						
High school	6(4.3)	98.16 $\pm$ 6.64	24.83 $\pm$ 2.56	25.66 $\pm$ 1.86	22.83 $\pm$ 3.76	24.83 $\pm$ 2.31
Associate degree	19(13.8)	105.36 $\pm$ 10.82	28.10 $\pm$ 4.18	28.05 $\pm$ 3.65	23.78 $\pm$ 3.73	25.42 $\pm$ 2.77
Bachelor's degree	99(71.7)	105.32 $\pm$ 13.65	28.22 $\pm$ 5.08	27.52 $\pm$ 4.11	23.11 $\pm$ 3.23	26.46 $\pm$ 3.74
Postgraduate degree	14(10.2)	106.28 $\pm$ 12.80	28.28 $\pm$ 4.19	28.85 $\pm$ 3.43	23.07 $\pm$ 4.19	26.07 $\pm$ 3.51
Test; df; P		f=0.617; 3; .605	f=0.944; 3; .421	f=1.048; 3; .374	f=0.238; 3; .869	f=0.784; 3; .505
Marital status						
Single	59(42.8)	101.40 $\pm$ 12.03	27.01 $\pm$ 4.39	26.69 $\pm$ 3.55	22.47 $\pm$ 3.26	25.22 $\pm$ 3.72
Married	79(57.2)	107.88 $\pm$ 13.02	28.84 $\pm$ 4.99	28.36 $\pm$ 4.07	23.72 $\pm$ 3.41	26.94 $\pm$ 3.25
Test; df; P		t=-2.985; 136; .003**	t=-2.241; 136; .027*	t=-2.517; 136; .013*	t=-2.160; 136; .033*	t=-2.901; 136; .004**
Total years of professional experience $\bar{x} \pm SD= 10.00 \pm 7.03$						
1-4 years (1)						
5-9 years (2)	36(26.1)	98.41 $\pm$ 10.99	26.08 $\pm$ 4.68	26.33 $\pm$ 3.16	21.38 $\pm$ 2.32	24.61 $\pm$ 4.17
10-14 years (3)	31(22.5)	102.51 $\pm$ 12.47	26.83 $\pm$ 4.21	26.51 $\pm$ 4.28	23.12 $\pm$ 3.71	26.03 $\pm$ 3.17
15-19 years (4)	33(23.9)	108.66 $\pm$ 11.85	29.21 $\pm$ 4.59	28.69 $\pm$ 3.52	24.06 $\pm$ 3.79	26.69 $\pm$ 2.97
≥ 20 years (5)	25(18.1)	109.12 $\pm$ 15.12	29.52 $\pm$ 5.45	28.64 $\pm$ 4.80	23.80 $\pm$ 2.98	27.16 $\pm$ 3.65
	13 (9.4)	113.15 $\pm$ 7.53	30.76 $\pm$ 3.05	29.46 $\pm$ 2.29	24.92 $\pm$ 3.09	28.00 $\pm$ 2.04
Test; df; P		F=5.915; 4; .001** 1<3-4-5; 2<5	F=4.504; 4; .002** 1<5; 2<5	F=3.569; 4; .008** 1<3-5; 2<5	F=4.542; 4; .002** 1<3-5	F=3.500; 4; .009** 1<5

Table 2. Comparison of participants' demographic characteristics with the mean scores of the Psychological Capital Scale and its sub-dimensions (n=138) (Continued)

Descriptive Characteristics Test; df; P; Post Hoc	n (%)	Psychological Capital $\bar{x} \pm SD$	Self-efficacy $\bar{x} \pm SD$	Hope $\bar{x} \pm SD$	Optimism $\bar{x} \pm SD$	Resilience $\bar{x} \pm SD$
Duration of employment at current institution $\bar{x} \pm SD = 7.00 \pm 4.80$						
1-5 years (1)	64(46.4)	100.09 $\pm$ 13.63	26.23 $\pm$ 5.16	26.82 $\pm$ 4.07	22.06 $\pm$ 3.12	24.96 $\pm$ 4.10
6-10 years (2)	36(26.1)	105.80 $\pm$ 12.59	28.41 $\pm$ 4.63	27.30 $\pm$ 4.15	23.36 $\pm$ 3.88	26.72 $\pm$ 2.83
11-15 years (3)	33(23.9)	112.48 $\pm$ 7.28	30.63 $\pm$ 2.43	29.15 $\pm$ 2.98	24.87 $\pm$ 2.64	27.81 $\pm$ 2.24
16-20 years (4)	5 (3.6)	115.80 $\pm$ 5.01	32.00 $\pm$ 3.24	30.80 $\pm$ 1.92	25.20 $\pm$ 2.28	27.80 $\pm$ 2.28
Test; df; P		F=9.359; 3; .001**	F=8.621; 3; .001**	F=3.929; 3; .010*	F=6.338; 3; .001**	F=6.027; 3; .001**
		1<3-4, 2<3-4	1<3-4	1<3-4, 2<4	1<3	1<3
Number of monthly shifts $\bar{x} \pm SD = 6.00 \pm 4.30$						
None (1)	20(14.5)	109.35 $\pm$ 16.99	29.50 $\pm$ 5.87	28.40 $\pm$ 4.81	24.60 $\pm$ 3.93	26.85 $\pm$ 3.95
1-5 shifts (2)	39(28.3)	110.35 $\pm$ 10.92	29.58 $\pm$ 4.07	28.97 $\pm$ 3.57	24.46 $\pm$ 2.97	27.33 $\pm$ 3.08
6-10 shifts (3)	42(30.4)	101.66 $\pm$ 11.40	26.54 $\pm$ 4.50	26.76 $\pm$ 3.68	22.47 $\pm$ 2.60	25.88 $\pm$ 3.33
11-15 shifts (4)	37(26.8)	101.21 $\pm$ 12.03	27.40 $\pm$ 4.76	26.86 $\pm$ 3.73	21.89 $\pm$ 3.68	25.05 $\pm$ 3.74
Test; df; P		F=5.415; 3; .002**	F=3.722; 3; .013*	F=3.050; 3; .031*	F=5.967; 3; .001**	F=3.068; 3; .030*
		3-4<1, 3-4<2	3<1, 3-4<2	3-4<2	3-4<1, 3-4<2	3-4<2
Unit of employment						
Internal clinics (1)	17(12.3)	99.41 $\pm$ 12.19	26.17 $\pm$ 5.10	25.88 $\pm$ 3.12	22.64 $\pm$ 2.99	24.70 $\pm$ 3.70
Surgical clinics (2)	22(15.9)	102.90 $\pm$ 10.79	27.27 $\pm$ 3.90	26.18 $\pm$ 3.72	23.54 $\pm$ 3.12	25.90 $\pm$ 2.99
Intensive care units (3)	58(42.0)	104.31 $\pm$ 11.90	27.65 $\pm$ 4.36	27.58 $\pm$ 3.39	22.86 $\pm$ 3.56	26.20 $\pm$ 3.53
Other (4)	41(29.8)	109.80 $\pm$ 14.62	29.85 $\pm$ 5.34	29.26 $\pm$ 4.50	23.68 $\pm$ 3.48	27.00 $\pm$ 3.69
Test; df; P		F=3.329; 3; .022*	F=3.244; 3; .024*	F=4.860; 3; .003**	F=0.687; 3; .561	F=1.770; 3; .156
		1-2-3<4	1-2-3<4	1-2-3<4		
Working status						
Service nurse (1)	86(62.3)	101.10 $\pm$ 11.06	26.86 $\pm$ 4.41	26.72 $\pm$ 3.37	22.19 $\pm$ 3.15	25.32 $\pm$ 3.48
Responsible nurse (2)	20(14.5)	114.05 $\pm$ 8.28	30.55 $\pm$ 4.03	29.60 $\pm$ 2.52	25.60 $\pm$ 2.74	28.30 $\pm$ 2.12
Polyclinic nurse (3)	7(5.1)	115.71 $\pm$ 4.99	32.42 $\pm$ 2.99	31.57 $\pm$ 2.37	23.85 $\pm$ 1.86	27.85 $\pm$ 1.86
Other (4)	25(18.1)	108.80 $\pm$ 17.19	29.00 $\pm$ 5.61	28.20 $\pm$ 5.53	24.48 $\pm$ 3.70	27.12 $\pm$ 4.08
Test; df; P		F=9.677; 3; .001**	F=6.489; 3; .001**	F=6.390; 3; .001**	F=8.201; 3; .001**	F=5.641; 3; .001**
		1<2-3	1<2-3	1<2-3	1<2-4	1<2-3
Weekly working hours $\bar{x} \pm SD = 57.00 \pm 23.07$						
40 hours (1)	34(24.6)	112.35 $\pm$ 10.79	30.41 $\pm$ 3.94	29.05 $\pm$ 3.93	24.97 $\pm$ 2.93	27.91 $\pm$ 2.63
41-50 hours (2)	36(26.1)	106.25 $\pm$ 15.13	28.36 $\pm$ 5.45	28.00 $\pm$ 4.42	23.55 $\pm$ 3.85	26.33 $\pm$ 3.77
51-60 hours (3)	17(12.3)	101.05 $\pm$ 8.58	26.29 $\pm$ 4.35	26.64 $\pm$ 2.95	22.35 $\pm$ 1.99	25.76 $\pm$ 2.88
>60 hours (4)	51(37.0)	100.84 $\pm$ 11.81	26.88 $\pm$ 4.48	26.80 $\pm$ 3.63	22.01 $\pm$ 3.22	25.13 $\pm$ 3.77
Test; df; P		F=6.779; 3; .001**	F=4.911; 3; .003**	F=2.809; 3; .042*	F=6.252; 3; .001**	F=4.577; 3; .004**
		2-3-4<1, 4<2	3-4<1	3-4<1	3-4<1, 4<2	3-4<1
Working style						
Day (1)	33(23.9)	111.81 $\pm$ 14.24	30.06 $\pm$ 4.97	29.33 $\pm$ 4.44	24.78 $\pm$ 3.21	27.63 $\pm$ 3.44
Night (2)	11(8)	103.18 $\pm$ 15.95	27.36 $\pm$ 4.86	26.63 $\pm$ 4.94	23.00 $\pm$ 3.57	26.18 $\pm$ 4.16
Shift (3)	94(68.1)	102.98 $\pm$ 11.39	27.44 $\pm$ 4.61	27.18 $\pm$ 3.47	22.64 $\pm$ 3.29	25.71 $\pm$ 3.42
Test; df; P		F=6.231; 2; .003**	F=3.877; 2; .023*	F=4.245; 2; .016*	F=5.147; 2; .007**	F=3.715; 2; .027*
		2-3<1	3<1	2-3<1	3<1	3<1
Choosing the profession willingly						
Yes	95(68.8)	105.90 $\pm$ 12.14	28.20 $\pm$ 4.70	27.85 $\pm$ 3.64	23.29 $\pm$ 3.00	26.55 $\pm$ 3.39
No	43(31.2)	103.37 $\pm$ 14.64	27.76 $\pm$ 5.10	27.20 $\pm$ 4.53	22.95 $\pm$ 4.16	25.44 $\pm$ 3.81
Test; df; P		t=1.063; 136; .290	t=0.487; 136; .627	t=0.374; 136; .376	t=0.545; 136; .587	t=1.719; 136; .088
Satisfaction with communication among colleagues						
Satisfied	104(75.4)	105.66 $\pm$ 13.67	28.25 $\pm$ 4.93	27.93 $\pm$ 4.11	23.15 $\pm$ 3.45	26.32 $\pm$ 3.60
Not satisfied	34(24.6)	103.44 $\pm$ 10.55	27.50 $\pm$ 4.45	26.79 $\pm$ 3.22	23.29 $\pm$ 3.26	25.85 $\pm$ 3.43
Test; df; P		t=0.866; 136; .388	t=0.787; 136; .433	t=1.471; 136; .144	t=-0.208; 136; .835	t=0.673; 136; .502
Willingness to participate in any psychological intervention						
Yes	54(39.1)	104.64 $\pm$ 13.65	27.94 $\pm$ 4.90	27.40 $\pm$ 4.04	23.20 $\pm$ 3.59	26.09 $\pm$ 3.76
No	84(60.9)	105.41 $\pm$ 12.58	28.14 $\pm$ 4.78	27.80 $\pm$ 3.87	23.17 $\pm$ 3.28	26.28 $\pm$ 3.43
Test; df; P		t=-0.339; 136; .735	t=-0.235; 136; .814	t=-0.584; 136; .560	t=0.042; 136; .966	t=-0.310; 136; .757

$\bar{x}$; Mean, SD; Standard Deviation, t; Independent samples t-test, F; One-way analysis of variance (ANOVA), MWU; Mann-Whitney U test, df; Degree of freedom

* $P < .05$, ** $P < .01$

Nurses with 1–4 years of professional experience (98.41 ± 10.99) had significantly lower mean psychological capital scores ($F(4)=5.915$; $P<.01$). Similarly, the mean psychological capital scores of nurses with 1–5 years (100.09 ± 13.63) and 6–10 years (105.80 ± 12.59) of institutional experience were found to be significantly lower ($F(3)=9.359$, $P<.01$).

In the study, nurses who did not work night shifts or had 1–5 night shifts per month were found to have significantly higher mean psychological capital scores ($F(3)= 5.415$; $P<.01$). Nurses working in other units (such as emergency and outpatient clinics) (109.80 ± 14.62) had significantly higher psychological capital scores compared to those working in internal medicine, surgical units, and intensive care units ($F(3)= 3.329$; $P<.05$). No statistically significant differences were observed between the optimism and resilience subdimensions and the unit of employment ($P>.05$). Nurses working in inpatient units

(101.10 ± 11.06) had significantly lower psychological capital scores ($F(3)= 9.677$; $P<.01$). Moreover, nurses working 40 hours per week (112.35 ± 10.79) demonstrated significantly higher psychological capital scores ($F(3)=6.779$; $P<.01$). A significant difference was also found in terms of work schedules ($F(2)=6.231$; $P<.01$), with day-shift nurses (111.81 ± 14.24) having significantly higher psychological capital scores (Table 2).

As shown in Table 3, psychological capital was positively and moderately correlated with age ($r= 0.37$), total years of professional experience ($r= 0.38$), and duration of employment at the institution ($r= 0.45$), with statistical significance ($P<.01$). Psychological capital was negatively and moderately correlated with the monthly number of shifts ($r= -0.30$, $P<.01$), and negatively and weakly correlated with weekly working hours ($r=-0.24$, $P<.01$) (Table 3).

Table 3. Relationship between the Psychological Capital Scale and its sub-dimensions and some Introductory Variables^a (n=138)

Variables	1	2	3	4	5	6	7	8	9	10
1. Psychological Capital	1									
2. Self-efficacy	0.87**	1								
3. Hope	0.88**	0.74**	1							
4. Optimism	0.67**	0.40**	0.46**	1						
5. Resilience	0.83**	0.63**	0.67**	0.44**	1					
6. Age	0.37**	0.33**	0.28**	0.32**	0.29**	1				
7. Total professional years	0.38**	0.34**	0.29**	0.32**	0.30**	0.93**	1			
8. Working period in the institution	0.45**	0.43**	0.33**	0.36**	0.35**	0.61**	0.64**	1		
9. Monthly number of shifts	-0.30**	-0.25**	-0.24**	-0.30**	-0.21*	-0.50**	-0.50**	-0.39**	1	
10. Weekly working hours	-0.24**	-0.19*	-0.17*	-0.24**	-0.19*	-0.37**	-0.35**	-0.29**	0.52**	1

^aPearson correlation was used. The interpretation criteria for the correlation coefficient (r) were as follows: low (0–0.29), moderate (0.30–0.69), and high (≥ 0.70).²²

* $P<.05$, ** $P<.01$

DISCUSSION

In this study, the psychological capital levels of nurses were determined, and their relationships with demographic characteristics were examined. The mean psychological capital score of nurses was found to be 105.11 ± 12.97 (Table 1). This value is higher than the averages reported in other studies (79.18 ± 11.17),⁵ (95.21 ± 17.75),²³ (99.99 ± 18.30)¹³, and (97.45 ± 10.78)¹⁴. A study involving different professional groups found that nurses had higher levels of psychological capital, resilience, hope, and optimism compared to lawyers, and higher levels of resilience and optimism compared to physicians.²⁴ These findings highlight that, despite challenging working conditions, nurses exhibit high motivation and resilience.

The findings of this study reveal that there are different relationships between the psychological capital levels of nurses and their demographic characteristics. It is believed that the dynamics of the work environment and the individual characteristics of the participants play a decisive role in the interpretation of these relationships. For instance, the lower levels of psychological capital among younger nurses may be attributed to their lack of experience and underdeveloped capacity to cope with professional challenges. Similarly, the higher scores of married nurses may be related to the strength of their social support systems. Conditions in the work environment, differences in workload across units, and individual professional experiences may contribute to variations in psychological capital levels.

In this study, the highest mean score in the sub-dimensions of the scale was found to be "self-efficacy" (28.06 ± 4.81), while the lowest mean score was found to be "optimism" (23.18 ± 3.39) (Table 1). Similar results have been reported in other studies.^{7,25} High self-efficacy scores in nurses suggest that they have a high level of self-confidence, while low optimism scores indicate a lower level of positive thinking. This finding may be associated with the challenges faced in the profession and the impacts of the global pandemic period.²⁶ Enhancing all dimensions of psychological capital may increase positive thinking and improve the ability to cope with stressful situations.^{6,11} Furthermore, it has been suggested that psychological capital and its constituent elements not only help individuals to achieve greater success in their work but also provide them with more confidence and increase their job satisfaction and commitment by fostering positive thinking.²⁷

In this study, no statistically significant difference was found between the psychological capital levels of nurses and variables such as gender, education level, choice of profession, satisfaction with communication with colleagues, and willingness to participate in any psychological activity ($P > .05$) (Table 2). The findings suggest that the psychological capital levels of nurses may develop independently of these factors. There are varying results in the scientific literature regarding similar variables. While some studies have found a significant difference between psychological capital levels and gender or education level, others have reported no significant differences.^{1,7,11-13} These discrepancies may be attributed to factors such as differences in the participant groups and their personal characteristics, the culture of the institutions where they work, and the effects of the global pandemic.

In the present study, it was found that younger nurses, particularly those under the age of 30, had lower levels of psychological capital (Table 2). In a study conducted by Yıldız and Örüçü¹, individuals aged 32–45 and those aged 46 and above were found to have higher levels of psychological capital compared to those aged 18–31. Similarly, another study reported higher psychological capital among nurses aged 29–34.⁷ In contrast to these findings, some studies have shown no statistically significant differences in psychological capital scores across different age groups.^{11,12,25} Despite the varying results, the present study identified a moderately positive correlation between age and psychological capital ($r = 0.37$; $P < .01$) (Table 3). This may be attributed to the accumulation of knowledge and experience, the development of professional skills, and increased

exposure to problem-solving situations as individuals age, all of which may contribute to higher psychological capital. On the other hand, the relatively limited professional experience of younger nurses, their lower exposure to challenging situations, and thus underdeveloped resilience may explain their lower levels of psychological capital.¹⁴

The results of this study demonstrated that married nurses exhibited higher levels of psychological capital compared to their single counterparts (Table 2). This difference may be attributed to the broader social support networks commonly available to married individuals, including the emotional support provided by family members, which may enhance their capacity to cope with stress.²⁴ In the setting where the study was conducted, the ability of married nurses to maintain a more structured lifestyle and achieve a better work-life balance may have also contributed to these findings. Furthermore, the need for single participants to face professional challenges independently may have adversely impacted their psychological capital levels. The existing literature presents inconsistent findings regarding the relationship between marital status and psychological capital. While some studies have reported higher psychological capital among married nurses, others have found no statistically significant differences.^{7-11-13,24} Since this study did not include questions related to parenthood, future research should consider exploring variables such as whether nurses have children, the number of children, and the extent of spousal support.

It was found that nurses with a total professional experience of 10 years or more had significantly higher scores in psychological capital, self-efficacy, optimism, and resilience (Table 2). Consistent with these findings, previous studies have also reported that nurses with more than 10 years of professional experience tend to exhibit higher levels of psychological capital.^{1,7,13,25} Similarly, in a study conducted by Türesin Tetik and Köse²⁴, nurses with six or more years of experience demonstrated higher levels of overall psychological capital, self-efficacy, hope, resilience, and optimism. These findings suggest that longer professional tenure has a positive impact on psychological capital. This may be attributed to the accumulation of professional knowledge and clinical experience over time. Furthermore, the repeated exposure to workplace challenges fosters the development of problem-solving skills, enhances self-confidence, and strengthens resilience. Additionally, it has been suggested that nurses may develop greater patience, positivity, and resilience as a result of their professional experience.²⁵

It was observed that nurses who had been working in the institution for a longer period (11–20 years) had higher average psychological capital scores (Table 2). Similarly, a previous study reported that employees with more than 26 years of tenure within the same institution demonstrated higher levels of psychological capital.¹ However, some studies in the literature have found no statistically significant difference between institutional tenure and psychological capital scores.^{7,25} Extended duration of employment within an institution may enhance employees' sense of belonging and organizational commitment. Supporting this view, another study identified a positive relationship between psychological capital, job satisfaction, and commitment to work.²⁸

It was determined that nurses who had fewer shifts and worked during the day had a higher average psychological capital score (Table 2). Previous studies have similarly reported that nurses working during the day tend to have higher levels of psychological capital compared to those working night shifts, and a negative correlation has been observed between the number of night shifts monthly and psychological capital levels.^{25,28,29} It has been suggested that this may be attributed to the fact that night-shift nurses receive less positive feedback regarding their performance and are less frequently rewarded. Positive feedback, in particular, has been emphasized as a crucial factor in enhancing self-efficacy.²⁵ Furthermore, working a shift system may negatively impact various aspects of personal life, such as the ability to establish and maintain routines or make long-term plans. The disruption of sleep patterns and increased fatigue associated with continuous night shifts may also adversely affect psychological capital.

It was found that the mean psychological capital score of nurses working in internal medicine, surgical units, and intensive care units was lower compared to nurses in other units (Table 2). No significant differences were observed in the dimensions of optimism and resilience based on the department in which they worked. Previous studies have also reported that there was no significant difference between the department in which nurses worked and their level of psychological capital.^{7,11,28,30} Possible explanations for this difference in the present study may include the high patient load, long-term patient stays, and the predominance of chronic diseases in these units. Additionally, the increased frequency of invasive procedures in these units may not only contribute to higher workloads but also place additional strain on nurses' psychological resilience.

It has been found that the mean scores of psychological capital, self-efficacy, hope, optimism, and resilience are lower in nurses working as ward nurses compared to those working in responsible and outpatient clinic positions (Table 2). The scientific literature indicates that nurses in responsible, expert, and managerial roles tend to exhibit higher levels of psychological capital.^{7,25,28} One study suggests that the self-confidence associated with the managerial positions held by nurse managers may contribute to this outcome.²⁵ Conversely, a study by Tang et al.¹³ found no significant difference between status and psychological capital.¹³ Working as a ward nurse may have a detrimental effect on psychological capital due to factors such as prolonged and intensive patient interaction, caregiving burden, experiencing compassion fatigue, and shift-based work schedules. Moreover, it has been suggested that nurse managers, due to their extensive clinical and managerial experience and the high levels of responsibility they bear in the hospital setting, are likely to experience a greater sense of purpose and enhanced job engagement. This, in turn, may contribute to a stronger desire for career advancement, higher job commitment, and greater job satisfaction.²⁸

It was determined that nurses working 50 hours or more per week had lower mean scores in psychological capital, self-efficacy, optimism, and resilience (Table 2). A review of the literature revealed that the relationship between weekly working hours and psychological capital or its sub-dimensions has not been widely investigated. However, in the current study, a weak and negative correlation was identified between weekly working hours and psychological capital and its components (Table 3). These findings suggest that longer working hours may result in nurses spending more time in the hospital environment. This situation may contribute to increased stress levels, accompanied by negative emotional states such as fatigue and burnout. Moreover, prolonged and uninterrupted work hours may exacerbate the imbalance between family, social, and professional life. The inability of nurses to engage in alternative personal or social activities due to their demanding work schedules may also negatively impact their psychological capital.

Study Limitations

This study was conducted with nurses employed at a university hospital; therefore, the findings are specific to this institution and may not be generalizable to other healthcare settings. Due to the timing of the study during the COVID-19 pandemic, data were collected through both online and face-to-face surveys. The combined use of these two data collection methods may have

introduced variability in the process and affected the consistency of responses. Additionally, since the data were based on self-reported questionnaires, the results reflect participants' subjective evaluations and may be influenced by individual perceptions. The descriptive design of the study further limits the ability to establish causal relationships.

This study examined the psychological capital levels of nurses and the factors influencing them. The findings indicated that the mean psychological capital scores were generally in line with the existing literature; however, varying associations were observed with certain demographic and occupational variables. Higher levels of psychological capital were found among nurses who were married, had longer tenures in the profession and institution, had fewer shifts and weekly working hours, and worked daytime schedules. It is recommended to address and mitigate the factors that negatively influence psychological capital and to foster supportive work environments. Future research should adopt a multifactorial approach to comprehensively assess other potential determinants of psychological capital and its sub-dimensions.

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Health Literacy and Affecting Factors in Individuals with Stroke: A Cross-Sectional Study

İnme Geçiren Bireylerde Sağlık Okuryazarlığı ve Etkileyen Faktörler: Kesitsel Çalışma

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ABSTRACT

Objective: This study aimed to examine the factors affecting the health literacy of individuals with stroke.

Methods: In this analytical and cross-sectional study, "Sociodemographic Characteristics Form" and "the Health Literacy Scale" were administered to 223 individuals with stroke who were hospitalized in the neurology clinic of a university hospital in western Turkey. The research data were analyzed in the "Statistical Package for the Social Sciences 22" program. Kolmogorov-Smirnov test, Pearson Correlation, Mann Whitney U, "Kruskal Wallis", and "Post Hoc/Games-Howell" tests were used.

Results: The total mean scale score in our study was 88.67±22.36. The mean rank values of the individuals, who were aged below 50, who had a high education level, and who did not have a chronic disease other than stroke, on the scale and all its subscales were significantly higher. The mean rank of the scale increased as the economic status raised from low to high. The mean rank value of those who received training from health professionals on the "access to information subscale" was significantly higher.

Conclusion: Age, marital status, education level, income level, general health status, presence of another chronic disease, and status of receiving training from a health professional were determined as factors affecting health literacy in individuals with stroke. It is thought that determining the health literacy levels of inpatients with stroke is an important step in determining the stroke literacy levels of individuals and thus their awareness of stroke.

Keywords: Stroke, health literacy, nursing

ÖZ

Amaç: Bu çalışmada inme geçiren bireylerin sağlık okuryazarlığını etkileyen faktörlerin incelenmesi amaçlandı.

Yöntemler: Analitik ve kesitsel olan bu çalışmada, Türkiye'nin batısındaki bir üniversite hastanesinin nöroloji kliniğinde yatan 223 inme geçirmiş bireye "Sosyodemografik Özellikler Formu" ve "Sağlık Okuryazarlığı Ölçeği" uygulandı. Araştırma verileri "Statistical Package for the Social Sciences 22" programı ile analiz edildi. Kolmogorov-Smirnov testi, Pearson Korelasyonu, Mann Whitney U, "Kruskal Wallis" ve "Post Hoc/Games-Howell" testleri kullanıldı.

Bulgular: Çalışmamızda ölçeğin toplam puan ortalaması 88,67±22,36 idi. 50 yaş altında olan, eğitim düzeyi yüksek olan ve inme dışında bir kronik hastalığı bulunmayan bireylerin ölçek ve tüm alt boyutlardan aldıkları sıra değeri ortalamaları anlamlı şekilde daha yüksek bulundu. Ekonomik durum düşükten yükseğe gittikçe ölçeğin toplam sıra değeri ortalaması arttı. Sağlık çalışanlarından eğitim alanların "bilgiye erişim alt boyutu" sıra değeri ortalaması anlamlı olarak daha yüksekti.

Sonuç: Yaş, medeni durum, eğitim düzeyi, gelir düzeyi, genel sağlık durumu, başka bir kronik hastalık mevcudiyeti ve sağlık çalışanından eğitim almış olma durumu inme geçiren bireylerde sağlık okuryazarlığı etkileyen faktörler olarak saptandı. Yatarak tedavi gören inme geçirmiş bireylerin sağlık okuryazarlık düzeylerinin tespit edilmesinin, inme okuryazarlık düzeylerinin, dolayısıyla inme konusundaki farkındalıklarının belirlenmesinde önemli bir adım olduğu düşünülmektedir.

Anahtar Kelimeler: İnme, sağlık okuryazarlığı, hemşirelik

INTRODUCTION

Stroke is one of the leading causes of death and disability worldwide and is highly preventable.¹ It is emphasized that age is one of the most important risk factors for stroke, and an estimated 75% of strokes occur in people 65 years old and above.² It was reported that there were 7.44 million deaths due to stroke worldwide in 2021.³ According to the data from the Global Burden of Disease Study, in 2019, the incidence of stroke for Turkey was estimated as 125,345 (154 per hundred thousand), the prevalence was 1,080,380 (1.3%), the death rate due to stroke was 48,947 and the number of life years lost due to stroke-related death/disability was estimated to be 993,082 years.⁴

Stroke burden largely depends on modifiable risk factors and may be influenced by modifiable factors such as the risk of recurrent stroke, smoking, and patient compliance with oral antihypertensives and antithrombotics.⁵ Many of these risk factors can be affected by the patient's ability to understand, implement, and maintain recommendations of health professionals.⁶ Therefore, stroke is one of the chronic diseases in which the concept of health literacy, which is defined as the ability of individuals to acquire, understand, and cope with the necessary health information to improve their health, gains importance.⁵ Poor health literacy can be a major barrier to the ability of people with stroke to reduce their risk of recurrent stroke.⁶

Health literacy is an understanding that interfaces with technological and social environments and involves multiple cognitive and social domains.⁷ An inadequate level of health literacy can cause difficulties in patients' understanding of health-related information and messages, less utilization of preventive health services, problems in accessing health services, delayed time of diagnosis, increased use of emergency services, lack of understanding of medical instructions, difficulties in complying with recommended treatments, and low self-management.^{6,8,9} Low health literacy may also increase the incidence of chronic diseases, the frequency of hospitalizations, disease-related direct costs, and mortality.^{5,8,10} Low health literacy levels are common in Turkey, and 9 out of 10 elderly individuals aged 65 and over have been reported to have inadequate or limited health literacy.¹¹ This suggests that stroke-related health literacy may also be low.

In the literature, the knowledge of stroke symptoms and risk factors is defined with the term "stroke literacy".¹² The literature highlights the need to improve stroke literacy.¹³ People with stroke and their relatives often have unmet needs for training on all aspects of stroke care, including the causes of stroke, the prevention of stroke, and post-

stroke recovery.¹⁴ It is considered important for individuals to receive training on individual stroke risk factors, stroke alarm symptoms, activation of emergency medical systems, need for follow-up after discharge, prescription medications and treatments, especially before being discharged after an acute stroke.¹³ However, in a study evaluating the effect of health literacy on continuing education of individuals who had a stroke, it was noted that more than half of the individuals had inadequate health literacy.⁶

Effective maintenance of post-stroke self-management majorly depends on patients' health literacy.¹⁰ Advanced stroke literacy is inadequate on its own; however, is considered an important component in an approach to reducing the risk of recurrent stroke.^{5,6,15} In the literature, there are studies focusing on health literacy of stroke survivors.^{6,16-19} In these studies, medication literacy in stroke survivors, mental health literacy in stroke survivors, the relationship of stroke health literacy with stroke risk factors and post-stroke depression, the knowledge status of individuals about stroke at the time of discharge in acute stroke, and the effect of health literacy on the continuation of education in stroke survivors were examined. However, no study has been conducted on this subject in Turkey.

AIM

This study aimed to examine the factors affecting the health literacy of stroke individuals receiving inpatient treatment at a university hospital in Turkey.

Research questions are as follows:

- What is the level of health literacy of individuals with stroke?
- What are the factors affecting health literacy in individuals with stroke?

METHODS

Study Design

This study had an analytical and cross-sectional design and was presented in adherence to the Strobe Checklist.

Study Population

The data were collected in the 14-bed neurology clinic of a university hospital in Turkey between December 2021 and October 2022. The number of individuals treated in the neurology department of the hospital in 2020 was 1465. The sample size was calculated as 223 based on an incidence of 18.4% with a confidence interval of 95% and an accuracy of 5%, using the sample calculation method for an incidence of an event with a known population.²⁰ Inclusion criteria were (1) being aged over 18, (2) having a score of "0,1,2" on the Modified Rankin Scale (mRS), (3)

being conscious without any cognitive impairment and memory loss, (4) volunteering to participate in the study, (5) being literate, and (6) having no communication barriers.

Of the 248 individuals evaluated for eligibility, 223 individuals who were confirmed eligible were included in the study. Since 9 individuals with stroke refused to participate in the study and 16 individuals scored 3,4,5 on the mRS, 25 individuals were excluded. The remaining 223 individuals were included in the final analysis.

Instruments

The data of the study were collected using a "Sociodemographic Characteristics Form" and the "Health Literacy Scale".

Sociodemographic Characteristics Form: This form was prepared by the researchers based on the literature.^{21,22} The form includes questions regarding the socio-demographic characteristics of individuals (age, gender, education level, marital status, occupation, social security, income status, and place of longest residence) as well as questions about health status (height, weight, body mass index, smoking-alcohol use, presence of another chronic disease, type of stroke, recurrent stroke status, duration of stroke diagnosis, the status of receiving training on stroke, regular medication status, blood pressure measurement, compliance with dietary recommendations, adoption of an active lifestyle, following appointments, evaluation of general health status). This form consists of 27 items in total.

The Health Literacy Scale: It consists of 25 items and four subscales. The Turkish validity and reliability study of the scale were established by Aras and Bayik Temel.²² All items on the scale have a positive structure and there is no reverse item. The scale is scored between 1-5 points. A minimum of 25 and a maximum of 125 points are obtainable from the scale. Low scores indicate that the level of health literacy is inadequate, problematic, and weak and high scores indicate that the level is adequate. The higher the score, the higher the level of health literacy. The scale has four subscales. The "Access to information" subscale includes five items; a minimum score of 5 and a maximum score of 25 can be taken from this subscale. The "Understanding information" includes seven items; a minimum score of 7 and a maximum score of 35 can be taken from this subscale. The "Appraisal" subscale consists of 8 items and a minimum score of 8 and a maximum score of 40 can be taken from this subscale. The "Application" subscale includes 5 items and a minimum score of 5 and a maximum score of 25 can be taken from this subscale. The Cronbach Alpha value was found to be 0.92 for the overall

scale and between 0.62 and 0.79 for the subscales. In this study, the Cronbach Alpha value of the Health Literacy Scale was found to be 0.96.

The Modified Rankin Scale (mRS): This scale is used to measure the degree of disability in patients who have had a stroke. The scale is graded on a score of 0 to 6. For outcome prediction in clinical trials, the mRS is usually dichotomized where good functional outcome is a score 0-2 and poor functional outcome 3-6.²³

Data Collection

The questionnaire forms were applied by the researchers in face-to-face interviews in the patient rooms of the neurology clinic for an average of 20 minutes. To collect the research data, the individuals with stroke in the neurology clinic were visited 3 days a week (on weekdays, on days when assistant researchers were available) between 08:00-17:00. The questionnaire was filled out using the self-report method. However, the researchers guided individuals who requested help while filling in the questionnaires (for example, the individuals did not have glasses with him although he needed reading glasses or asked for help from the researcher due to fatigue). During the study, the care and treatment process of the participants and the routine workflow of the clinic were not interrupted.

Statistical Analysis

The research data were analyzed in the Statistical Package for the Social Sciences 22 (IBM SPSS Corp., Armonk, NY, USA) program. Descriptive statistics were presented as numbers, percentage distributions, and mean (mean)±standard deviation (SD) values. Kolmogorov-Smirnov or Shapiro-Wilk tests were used to evaluate whether the data showed a normal distribution. Numerical values with normal distribution were compared with the "Pearson Correlation" analysis and categorical variables and dependent variables were compared using the "Mann Whitney U", "Kruskal Wallis", and "Post Hoc/Games-Howell" tests. The strength of the correlation coefficient; very weak (0.00-0.25), weak (0.26-0.49), moderate (0.50-0.69), high (0.70-0.89), very high (0.90-1.00) was evaluated.²⁴ Results are presented at a confidence interval of 95% and a significance level of $P<.05$.

Ethical Aspect of Research

The study was conducted in accordance with the Declaration of Helsinki. The protocol of the present study was approved by Aydın Adnan Menderes University Faculty of Nursing Non-Interventional Clinical Research Ethics Committee (Date: 08.11.2021, Protocol No: 2021/272). Written informed consent was obtained from the individuals with stroke who met the inclusion criteria.

Participants were informed that they could withdraw from the study at any time for any reason with no negative consequences.

RESULTS

Sample characteristics

The majority of the individuals with stroke were aged 50 and over (89.2%) and married (91.5%). More than half of the participants (55.6%) were male. Most of the participants had a low level of education (74%), 41.3% were living in the city center, and more than half had a moderate economic status (64.6%) (Table 1).

Table 1. Distribution of the Participants According to Sociodemographic Characteristics (n = 223)

Patient characteristics	n	%
Age Mean $\pm$ SD: 67.67 $\pm$ 14.37 years		
Age Group		
<50 years	24	10.8
$\geq$ 50 years	199	89.2
Gender		
Female	99	44.4
Male	124	55.6
Marital Status		
Married	204	91.5
Single	19	8.5
Education Level		
Literate	82	36.8
Primary school	83	37.2
Middle school	19	8.5
High school	26	11.7
University	13	5.8
Working Status		
Working	29	13.0
Not working	194	87.0
Economic Status		
Low	73	32.7
Middle	144	64.6
High	6	2.7
Place of residence		
Rural	58	26.0
Urban	165	74.0
Body Mass Index		
Underweight	3	1.3
Normal weight	69	30.9
Pre-obesity	104	46.6
Obesity class I /II	42	18.8
Obesity class III	5	2.2
Smoking		
No	168	75.8
Smoking 1–10 cigarettes per day	15	6.7
Smoking 11–20 cigarettes per day	20	13.0
Smoking more than a pack per day	10	4.5

Table 1. Distribution of the Participants According to Sociodemographic Characteristics (n= 223) (Continued)

	n	%
Alcohol consumption		
No	209	93.7
Yes	14	6.3
Other Chronic Diseases		
Yes	181	81.2
No	42	18.8
Disease Duration		
Less than 1 month	139	62.3
1-3 months	16	7.2
4-11 months	16	7.2
1-3 years	24	10.8
More than 3 years	28	12.5
Education About Stroke		
Received training on stroke from a health professional	74	33.2
Received training on stroke from other sources	14	6.3
The number of recurrence stroke		
None	159	71.3
1 time	26	11.7
2 times	30	13.5
$\geq$ 3 times	8	3.5
Regular Medication		
Yes	203	91.0
No	20	9.0
Blood Pressure Measurement		
Twice per day	14	6.3
Once or several times a week	59	26.5
Once or several times a month	39	17.5
None	111	49.7
Following Dietary Recommendations		
Yes	39	17.5
Partially	118	52.9
No	66	29.6
Weight Control		
Yes	44	19.7
Partially	113	50.7
No	66	29.6
Regular Physical Activity		
Yes	52	23.3
Partially	95	42.6
No	76	34.1
Adherence to Medical Appointments		
Yes	174	78.0
Partially	23	10.3
No	26	11.7
Functional Health Status		
Very good	9	4.0
Good	75	33.6
Moderate	110	49.3
Poor	27	12.1
Very poor	2	1.0

Note: For continuous variables, n; number (%) ; mean (SD) is presented.

About half of the participants were overweight (46.6%). The most frequent comorbidities were hypertension (60.5%) and diabetes mellitus (39%). The majority of the participants were using their medications regularly (91.0%) and went to hospital appointments (78%), but half of them did not undergo blood pressure measurements regularly (49.8%). They partially complied with dietary recommendations (52.9%) and partially achieved weight control (50.7%). In terms of the duration of diagnosis, 62.3% of the participants had a stroke diagnosis for less than a month. 33.2% of the participants obtained information about their disease from health professionals and 71.3% did not develop recurrent stroke. Additional characteristics of the individuals are presented in Table 1.

Health literacy and affecting factors

The mean total score of the Health Literacy Scale was 88.67 ± 22.36 . Individuals with stroke had the highest mean score (27.91 ± 8.06) in the “appraisal” subscale, followed by understanding information (24.33 ± 7.15), application (20.92 ± 4.23), and access to information (15.60 ± 6.43), respectively (Table 2).

Table 2. Mean Scores of the Health Literacy Scale and its Subscales in Individuals with Stroke

	Mean	SD
Access	15.60	6.43
Understanding	24.33	7.15
Appraisal	27.91	8.06
Application	20.92	4.23
Total score	88.67	22.36

Note: Data presented as Mean (SD; Standart deviation)

There was a significant, negative and very weak correlation between age and “application” subscale score ($P < .001$, $r = -.240$). There was a significant, negative and weak correlation between age and other subscales scores (access, understanding, appraisal - total score) of the participants ($P < .001$, $r = -.445$; $P < .001$, $r = -.434$; $P < .001$, $r = -.373$; $P < .001$, $r = -.454$, respectively). The mean rank value of the scale and the mean rank values of the all subscales (access, understanding, appraisal, application) were higher in those aged below 50 compared to those aged 50 and over ($P < .001$; $P < .001$; $P < .001$; $P < .001$; $P = .005$, respectively) (Table 3).

The mean rank values of the single participants from all subscales were higher than that of the married participants. There was a statistically significant difference between them in “access”, “understanding”, and “appraisal” subscales whereas there was no significant difference between the two groups in terms of the “application” subscale ($P < .001$; $P = .004$; $P = .010$; $P = .681$, respectively) (Table 3).

The mean rank scores of those who were high school and university graduates on the overall scale and all subscales (access, understanding, appraisal, application) were statistically significantly higher than that of those who were literate, primary, and middle school graduates ($P < .001$; $P < .001$; $P < .001$; $P = .004$, respectively) (Table 3).

The mean rank values on the overall scale and all subscales increased as the economic status increased from low to high. The mean scale rank of the participants with low income was significantly lower than that of those with middle and high income ($P = .002$) (Table 3).

The mean rank values of those without chronic disease on the overall scale and all subscales (access, understanding, appraisal, application) were significantly higher ($P < .001$; $P = .005$; $P = .003$; $P = .002$; $P = .019$, respectively) (Table 3). The mean rank values of those who expressed their general health status as “poor” on the overall scale and all subscales were the lowest.

There was no significant difference between the mean rank values of the groups on the overall scale and all subscales in terms of health literacy, sex, disease duration, body mass index, and recurrent stroke status ($P > .05$) (Table 3).

DISCUSSION

Health literacy levels of the individuals with stroke

According to our study results, the mean health literacy score of individuals with stroke was 88.67 ± 22.36 . The level of health literacy increased as the scale score increased. Therefore, it can be said that the mean health literacy score of the participants was moderate in the studies conducted with individuals with stroke, similar to our study findings.^{16,17} In a study conducted on stroke health literacy, the level of stroke knowledge of inpatients was found to be low.²⁵ Other studies have reported inadequate stroke health literacy/knowledge both in the general population²⁶⁻²⁹ and in populations at high risk of stroke and individuals with stroke.^{19,26} To reduce the risk of recurrent stroke in people with stroke, it may be important to improve not only health literacy but also stroke literacy. Stroke literacy could not be addressed in our study due to the lack of an appropriate measurement tool. However, we observed that stroke awareness is insufficient in individuals with stroke. It is thought that stroke literacy should be examined more, especially in developing countries.

Health literacy and sociodemographic characteristics of individuals

In our study, the mean age of the individuals was 67.67 ± 14.37 . In similar studies carried out with people with stroke, the mean ages of individuals were 56.84 ± 10.22 and 51.80 ± 8.62 .^{16,17} The mean age obtained in one study was

Table 3. Health Literacy and the Affecting Factors

	Access	Understanding	Appraisal	Application	Total score
Age Mean	$r = -.445$	$r = -.434$	$r = -.373$	$r = -.240$	$r = -.454$
67.67±14.37	$P<.001^*$	$P<.001^*$	$P<.001^*$	$P<.001^*$	$P<.001^*$
Age Group					
<50 years	22.292 ±3.617 (MR:183,38)	30.250 ±5.69 (MR:168,17)	34.542 ±7.512 (MR:171,00)	22.833 ±3.144 (MR:146,54)	110.292±19.034 (MR:179,25)
≥50 years	14.794 ±6.233 (MR:103,39)	23.623 ±6.990 (MR:105,23)	27.121 ±7.776 (MR:104,88)	20.694 ±4.295 (MR:107,83)	86.070 ±21.337 (MR:103,89)
Test and P-value	MWU=675 <.001	MWU=1040 <.001	MWU=972 <.001	MWU=1559 .005	MWU=774 <.001
Gender					
Female	14.959 ±6.647 (MR:105.50)	23.505 ±6.739 (MR:102.90)	28.626 ±7.273 (MR:115.77)	21.273 ±4.004 (MR:117.86)	88.343 ±21.069 (MR:109.32)
Male	16.113 ±6.243 (MR:117.19)	25.000 ±7.428 (MR:119,26)	27.355 ±8.638 (MR:108.99)	20.645 ±4.402 (MR:107.32)	88.944 ±23.429 (MR:114.14)
Test and P -value	MWU=5494.50 .177	MWU=5237.50 .060	MWU=5764.50 .435	MWU=5558 .221	MWU=5873 .580
Marital Status					
Married	15.137 ±6.374 (MR:107.22)	23.922 ±7.106 (MR:108.23)	27.500 ± 8.067 (MR:108.60)	20.853 ± 4.342 (MR:111.46)	87.265 ±22.168 (MR:107.80)
Single	20.579 ±4.914 (MR:163.32)	28.789 ±6.223 (MR:152.53)	32.421 ±6.752 (MR:148.55)	21.684 ±2.769 (MR:117.76)	103.842±19.012 (MR:157.11)
Test and P -value	MWU=963 <.001	MWU=1168 .004	MWU=1243.50 .010	MWU=1828.50 .681	MWU=1081 <.001
Education Level					
Literate	13.012 ± 5.781 (MR:84.23)	20.537 ±6.009 (MR:76.29)	24.781 ±7.575 (MR:85.32)	19.707 ±4.539 (MR:92.73)	77.793 ±20.131 (MR:78.93)
Primary school	15.458 ±6.314 (MR:110.42)	25.181 ±6.775 (MR:119.25)	28.181 ±7.781 (MR:113.89)	21.386 ±4.111 (MR:118.54)	90.108 ±20.704 (MR:115.46)
Middle school	15.632 ±6.817 (MR:115.24)	25.211 ±7.292 (MR:122.47)	28.737 ±7.957 (MR:118.74)	21.211 ±3.735 (MR:112.58)	90.790 ±22.162 (MR:118.66)
High school	21.077 ±3.654 (MR:168.85)	29.423 ±5.686 (MR:160.27)	32.808 ±7.082 (MR:154.37)	22.192 ±3.499 (MR:134.58)	105.423±17.109 (MR:164.58)
University	21.846 ±4.219 (MR:178.85)	31.462 ±5.125 (MR:179.12)	35.077 ±5.251 (MR:173.65)	22.692 ±3.449 (MR:145.81)	111.615±15.289 (MR:183.62)
Test and P -value	KW = 49.747 <.001	KW = 55.437 <.001	KW = 37.454 <.001	KW = 15.223 .004	KW = 55.289 <.001
Economic Status					
Low	13.288 ±6.147 (MR:87.29)	22.904 ±6.880 (MR:97.55)	25.890 ± 7.109 (MR:92.21)	20.726 ±3.899 (MR:105.30)	82.726 ±19.452 (MR:91.60)
Middle	16.625 ±6.248 (MR:122.79)	24.938 ± 7.223 (MR:118.25)	28.667 ±8.409 (MR:119.71)	20.924 ±4.438 (MR:113.68)	91.035 ± 23.306 (MR:120.37)
High	19.167 ±7.441 (MR:153.75)	27.333 ± 6.861 (MR:137.75)	34.667 ±3.011 (MR:167.67)	23.333 ±2.422 (MR:153.08)	104.500 ± 15.719 (MR:159.25)
Test and P -value	KW = 17.358 <.001	KW = 5.987 .050	KW = 13.415 <.001	KW = 3.384 .184	KW = 12.943 .002
Other Chronic Diseases					
Yes	15.083 ± 6.311 (MR:106.14)	23.713 ±7.073 (MR:105.90)	27.182 ±7.959 (MR:105.43)	20.613 ±4.399 (MR:107.18)	86.419±21.896 (MR:104.87)
No	17.833±6.570 (MR:137,25)	27.024 ±6.951 (MR:138.29)	31.095 ± 7.849 (MR:140,30)	22.262 ± 3.132 (MR:132.79)	98.405 ±21.997 (MR:142.74)
Test and P -value	MWU=2740.50 .005	MWU = 2697 .003	MWU=2612.50 .002	MWU = 2928 .019	MWU = 2510 <.001

Table 3. Health Literacy and the Affecting Factors (Continued)

	Access	Understanding	Appraisal	Application	Total score
Disease Duration					
Less than 1 month	16.432 ±5.969 (MR:119.33)	24,712 ±7,152 (MR:115.78)	28,698 ±7,882 (MR:118.29)	21,043 ±4,039 (MR:113.62)	90,777 ±21,872 (MR:118.13)
1-3 months	15.438 ±5.738 (MR:106.34)	23,875 ±5,071 (MR:103.31)	28,125 ±5,427 (MR:108.47)	21,688 ±3,156 (MR:120.56)	89,125 ±12,590 (MR:107.81)
4-11 months	13.563 ±7.118 (MR:93.84)	21.938 ±9.313 (MR:93.50)	24.000 ±10.354 (MR:87.44)	19.688 ±5.885 (MR:105.09)	79.188 ±30.020 (MR:92.66)
1-3 years	13.333 ±6.888 (MR:89.88)	24.125 ±6.713 (MR:109.02)	26.708 ±8.493 (MR:102.25)	19.667 ±4.517 (MR:93.35)	83.917 ±22.236 (MR:95.92)
More than 3 years	14.679 ±7.761 (MR:108.16)	24.286 ±7.358 (MR:111.34)	27.214 ±8.139 (MR:105.16)	21.679 ±4.295 (MR:118.98)	87.500 ±23.664 (MR:108.80)
Test and P -value	KW=6.147 .188	KW = 2.142 .710	KW = 4.561 .335	KW = 2.943 .567	KW = 4.322 .364
Received training on stroke from a health professional					
Yes	17.324 ±5.276 (MR:128.01)	22.824 ±6.845 (MR:98.18)	27.595 ± 8.254 (MR:109.5)	20.770 ± 4.109 (MR:105.38)	88.243 ±22.738 (MR:110.80)
No	14.745 ±6.796 (MR:104.05)	25.087 ±7.206 (MR:118.86)	28.081 ±7.997 (MR:113.22)	21.000 ±4.304 (MR:115.29)	88.893 ±22.251 (MR:112.59)
Test and P -value	MWU= 4328 .009	MWU=4490.50 .024	MWU = 5331 .688	MWU = 5023 .275	MWU=5424.50 .845
Received training on stroke from other sources					
Yes	18.214 ±5.820 (MR:137.11)	26.929 ±7.966 (MR:136.96)	30.929 ±7.509 (MR:136.21)	19.500 ±6.0352 (MR:106.04)	95.857 ±24.491 (MR:133.39)
No	15.426 ±6.451 (MR:110.32)	24.162 ±7.083 (MR:110.33)	27.718 ±8.081 (MR:110.38)	21.019 ±4.087 (MR:112.40)	88.196 ±22.196 (MR:110.57)
Test and P -value	MWU=1111.50 .131	MWU=1113.50 .134	MWU = 1124 .147	MWU=1379.50 .718	MWU=1163.50 .200
Recurrent Stroke					
Yes	14.385 ±6.948 (MR:101.60)	23.385 ±7.514 (MR:103.47)	26.554 ±8.906 (MR:102.65)	20.446 ±4.812 (MR:105.23)	84.646 ± 24.505 (MR:101.68)
No	16.101 ±6.168 (MR:116.28)	24.728 ±6.986 (MR:115.51)	28.481 ±7.656 (MR:115.85)	21.120 ±3.970 (MR:114.78)	90.3354±21.283 (MR:116.25)
Test and P -value	MWU=4459 .121	MWU=4580 .205	MWU=4527 .165	MWU=4695 .310	MWU=4464 .125
Body Mass Index					
Underweight	12.667 ±6.658 (MR:76.17)	22.667 ±2.082 (MR:91.00)	24.667 ±8.145 (MR:78.50)	21.667 ±4.1633 (MR:123.83)	82.333 ±4.619 (MR:80.33)
Normal weight	16.449±6.676 (MR:121.93)	24.841±6.670 (MR:116.13)	28.652±8.339 (MR:118.97)	21.058±4.280 (MR:115.80)	91.0580±23.234 (MR:119.80)
Pre-obesity	15.471 ± 6.063 (MR:109.38)	24.048 ±7.081 (MR:108.92)	27.981 ±7.843 (MR:112.06)	21.183±4.289 (MR:116.25)	88.567 ±21.944 (MR:111.06)
Obesity class I /II	15.191 ± 6.872 (MR:108.92)	24.833 ±8.387 (MR:118.94)	26.809 ±8.497 (MR:103.46)	20.071 ±4.233 (MR:97.15)	86.500 ±23.149 (MR:107.11)
Obesity class III	11.800 ±7.049 (MR:76.90)	20.200 ±6.058 (MR:73.40)	27.800 ±6.535 (MR:106.30)	20.400 ±2.509 (MR:88.70)	80.200 ±20.315 (MR:84.00)
Test and P -value	KW = 4.337 .362	KW = 3.122 .538	KW = 2.393 .664	KW = 3.741 .442	KW = 2.939 .568
Functional Health Status					
Very good	14.333 ±7.649 (MR:99.94)	28.222 ±5.932 (MR:147.06)	29.111 ±6.092 (MR:118.78)	21.333 ±2.062 (MR:105.50)	93.000±16.008 (MR:121.17)
Good	17.520 ±6.650 (MR:133.98)	27.840 ±6.236 (MR:144.53)	31.493 ±7.645 (MR:142.53)	22.480 ±3.685 (MR:141.99)	99.333 ±21.248 (MR:145.46)
Moderate	16.064 ±5.027 (MR:113.03)	22.755 ±6.258 (MR:95.92)	27.036 ±6.837 (MR:101.99)	20.600±3.914 (MR:101.53)	86.236±18.626 (MR:101.85)
Poor	8.593±6.338 (MR:48.94)	19.704 ±8.743 (MR:75.31)	21.370 ±9.699 (MR:67.67)	18.111 ±5.409 (MR:77.26)	67.778 ±25.206 (MR:58.56)
Very poor	18.500 ±.707 (MR:136.50)	25.000 ±5.657 (MR:113.75)	25.500 ±7.778 (MR:85.50)	16.500 ± 7.778 (MR:61.50)	86.000 ±9.899 (MR:96.00)
Test and P -value	KW = 35.348 <.001	KW = 37.384 <.001	KW = 32.690 <.001	KW = 28.813 <.001	KW = 41.741 <.001

Note: Data presented as number (%), *P<.05, MWU; Mann Whitney U test, KW; Kruskal Wallis test; MR: Mean Rank, r; correlation coefficient

similar to the mean age found in our study.³⁰ According to our study results, there was a weak negative correlation between health literacy and age. Yalcinoz Baysal and Yıldız³¹ reached similar results in their study with older adults. Access to and appraisal of information decreases as age increases and it becomes difficult to understand information and use it in practice. Our study results showed that high school and university graduates had higher levels of health literacy. In the literature, it has been found that the level of health literacy is related to general literacy.^{7,32} In addition, it has been reported that the level of literacy decreases with age and low level of health literacy is more common among older adults and less educated individuals.^{33,34} In a study examining the drug literacy of stroke patients, it was found that the drug literacy levels of patients in the younger age group were higher.¹⁶ Younger individuals may have higher levels of health literacy due to fewer health problems, higher levels of literacy, and a more active mind.¹⁶ In the study conducted by Rheault et al.³⁴, being younger than 55 was found to be strongly associated with higher levels of health literacy. Young adults have more opportunities for further education. Given that most of the individuals who participated in our study were aged over 50 and had a low education level (literate/primary school), it can be suggested that low education level is a factor that affects health literacy, especially in advanced ages. A higher level of education can contribute to a better understanding of treatment, more attention to the treatment process, and better compliance with health professionals' referrals.¹⁶ Patients may have limited health literacy due to many reasons. For instance, those with low education levels have difficulty understanding and using complex health information and elderly patients have decreased cognitive and physical function due to aging.³³ It can be suggested that the level of health literacy is influenced by age and differs according to education levels and that the level of health literacy increases as the general education level increases.

In our study, no significant difference was determined between sex and health literacy. The lack of standardization in education and historical disadvantages in educational environments may have impacted individuals over a certain age.⁷ Therefore, regardless of sex, the general literacy levels of these individuals may remain low both in the early period and throughout life due to the limited educational opportunities of their generation. The fact that the mean age of the participants in our study was over 65 and most of them were aged over 50 can explain this situation. It is thought that the principle of lifelong learning should be included in the national education policy to improve the level of health literacy.

We found that single individuals had higher levels of health literacy than married participants. Similar results were obtained in a study examining health literacy in elderly individuals.³¹ In a study conducted with stroke individuals, no significant difference was reported between single and married stroke individuals in terms of health literacy.¹⁶ It is thought that the single individuals in our study had more opportunities to spare more time on health literacy activities than the married ones. However, different results in previous studies suggest that individual characteristics and current opportunities, as well as marital status, may also be effective in health literacy.

In our study, the levels of health literacy of those with poor economic status were lower compared to those with middle and high economic status. It has been stated in the literature that there is a strong correlation between health literacy and socioeconomic status.^{7,32} In the study conducted by Chang et al.¹⁶, it was reported that stroke individuals with high-income levels had better levels of health literacy levels. High-income individuals with stroke may find the opportunity to pay more attention to their quality of life after the disease compared to those with low income and therefore can attach more importance to issues within the scope of health literacy.¹⁶ It has been emphasized that low-income levels may negatively affect older adults in terms of the deprivation of education rights.⁷ Considering the mean age of the participants in our study, it can be suggested that health literacy may be associated with the social determinants of health. It is thought that those with high-income levels have more opportunities to access and use technology than those with low income, therefore their health literacy is better. It can be said that high-income level is a factor that positively affects health literacy.

Health literacy and health-related characteristics of individuals with stroke

In our study, it was determined that the level of health literacy of those who did not have any chronic disease other than stroke was higher than that of those who had a chronic disease other than stroke. In the literature, it has been stated that age and the number of chronic diseases contribute significantly to health literacy skills.³⁴ In the study conducted by Clairmont, Frey, and Adcock¹⁸, the level of health literacy of individuals with three or more stroke risk factors was found to be significantly higher than that of individuals with two or fewer stroke risk factors. In a study in which health literacy and modifiable risk factors for ischemic stroke were examined, it was determined that more than half of the participants had adequate health literacy, but a large proportion of the population had limited health literacy in areas such as good lifestyle,

smoking, alcohol use, and physical activity.³⁵ To increase individuals' awareness of the modifiable risk factors of stroke, the warning signs of stroke, and things to do in an emergency, it is important to first determine the general literacy, health literacy, and stroke literacy of patients, and then develop health policies that will include them in education programs according to the specified levels.

In our study, the levels of health literacy of those who expressed their general health status as good/moderate were found to be higher. In a study conducted with individuals with stroke, higher health literacy was associated with better general health.³⁶ According to our study results, the duration of stroke is not a factor that affects health literacy. In a similar study, it was found that 62% of individuals with stroke had adequate health literacy 12 months after discharge.³⁰ This difference may be because most of the individuals included in our study were newly diagnosed patients. Health literacy can be improved through social networks and interaction with health professionals. Individuals with stroke may have more opportunities to engage in interactions that improve their ability to acquire, understand, process, and practice health information.³⁰ However, more than half of the individuals in our study did not receive health training from any source and it was observed that those who received training on stroke from a health professional had higher scores regarding accessing and understanding information. For this reason, it is considered important that all individuals in the post-stroke period benefit from health services and can strengthen their health literacy, regardless of their education level. The majority of the individuals in our study did not have recurrent strokes. There was no difference in the levels of health literacy of individuals with and without recurrent stroke. This can be explained by the fact that patients do not have enough awareness of stroke even in the post-stroke period, do not demand health training, and post-discharge training has not yet been extended in hospitals in our country.

Study Limitations

There were some limitations of this study. The first limitation of the current study was that it was conducted in a single institution. The other one was the absence of a valid and reliable scale on stroke health literacy in our country.

It can be said that the general health literacy level of individuals with stroke is moderate. Age, marital status, education level, income level, general health status, presence of another chronic disease, and status of receiving training from a health professional are determined as factors affecting health literacy in

individuals with stroke. Although there is no relationship between recurrent stroke and disease duration and health literacy, there is a need for further studies with longer duration and larger samples to determine this relationship.

Determination of health literacy levels of individuals with stroke is an important step in determining their stroke literacy levels and therefore their awareness about stroke. Thus, patient-specific stroke education plans can be made. Nurses/health professionals working in the field of neurology must carry out stroke awareness training according to the age and education level of individuals with stroke. Our study results and clinical observations suggest that the stroke health literacy level of individuals with stroke, including knowledge of stroke symptoms, may be inadequate. Low health literacy may make individuals with stroke vulnerable to preventable health problems after stroke and risk of recurrent stroke. Therefore, it is important to develop valid and reliable measurement tools that can assess stroke literacy in stroke or healthy individuals and to determine the stroke literacy levels of individuals by health professionals with these tools. Integrating institutional policies into the healthcare system that will enable the determination of stroke literacy levels is a priority requirement.

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The Effect of Foot Reflexology on Pain, Anxiety and Mobility in Patients with Knee Arthroplasty

Diz Artroplastisi Yapılan Hastalarda Ayak Refleksolojisinin Ağrı, Anksiyete ve Hareketlilik Üzerine Etkisi

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ABSTRACT

Objective: The aim of this study was to examine the effect of foot reflexology on pain, anxiety and mobility in patients with knee arthroplasty.

Methods: The research was conducted as a control group experimental study. The study included 100 patients (50 patients in the experimental group and 50 patients in the control group). Patient Information Form, VAS Pain Form, BECK Anxiety Scale, Patient Mobility Scale, Observer Mobility Scale, Patient Mobilization Questionnaire were used to collect data from the participants.

Results: It was determined that the mean pain levels of the patients in the experimental group before and after the application on days 0,1 and 2 decreased and this difference was statistically significant ($P < .05$). It was determined that the mean pain scores of the patients in the control group on days 0,1 and 2 decreased and the difference between the mean pain scores on day 0 and day 1 was statistically significant ($P < .05$). The anxiety averages of the patients in the experimental group on day 0, day 1 and day 2 after reflexology application were significantly lower than the control group ($P < .05$). It was determined that the patients' mobility and mobilization numbers increased significantly with foot reflexology ($P < .05$).

Conclusion: The results of the study showed a decrease in the pain and anxiety levels and an increase in the number of mobilizations in the experimental group when compared to the control group. The notable reduction in pain and anxiety in the experimental group after receiving foot reflexology massage suggests that this complementary therapy is an effective complementary therapy for reducing both anxiety and pain.

Keywords: Anxiety, nursing care, pain, reflexology

ÖZ

Amaç: Bu çalışma, diz artroplastisi yapılan hastalarda ayak refleksolojisinin ağrı, anksiyete ve hareketlilik üzerine etkisini incelemek amacıyla yapılmıştır.

Yöntemler: Araştırma kontrol gruplu deneysel çalışma olarak yürütülmüştür. Çalışmaya 100 hasta (deney grubunda 50 hasta ve kontrol grubunda 50 hasta) dahil edilmiştir. Verilerin toplanmasında hasta tanıtım formu, VAS Ağrı Formu, BECK Anksiyete Ölçeği, Hasta Hareketlilik Ölçeği, Gözlemci Hareketlilik Ölçeği, hasta mobilizasyon soru formu kullanılmıştır.

Bulgular: Deney grubundaki hastaların 0.gün, 1. gün ve 2. gün uygulama öncesi ve sonrası ağrı ortalamalarının azaldığı ve bu farkın istatistiksel olarak anlamlı olduğu saptanmıştır ($P < .05$). Kontrol grubundaki hastaların ise 0.gün, 1.gün ve 2.gün ağrı ortalamasının azaldığı ve 0. ve 1. gün ağrı ortalamaları arasındaki farkın istatistiksel olarak anlamlı olduğu belirlenmiştir ($P < .05$). Deney grubundaki hastaların refleksoloji uygulamasından sonra 0. gün, 1. gün, 2. gün anksiyete ortalamaları kontrol grubuna göre anlamlı derecede daha düşüktür ($P < .05$). Ayak refleksolojisi ile hastaların hareketlilik ve mobilizasyon sayılarının anlamlı derecede arttığı saptanmıştır ($P < .05$).

Sonuç: Bu sonuçlar doğrultusunda deney grubunda kontrol grubuna göre ağrı ve anksiyete düzeylerinde azalma, mobilizasyon sayısında ise artış olduğu saptanmıştır. Deney grubunda ayak refleksolojisi uygulandıktan sonra ağrı ve anksiyetede belirgin bir azalmanın olması, bu tamamlayıcı tedavinin hem ağrıyı hem de anksiyeteyi azaltmada etkili bir yöntem olduğunu göstermektedir.

Anahtar Kelimeler: Anksiyete, hemşirelik bakımı, ağrı, refleksoloji



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INTRODUCTION

Total knee arthroplasty (TKA) surgery is a procedure that produces positive results in the treatment of pain caused by osteoarthritis, which is characterized by deterioration, wear and tear in the joint cartilage of the knee joint, which is a frequently performed orthopaedic procedure.¹ The general purpose of TKA surgeries is to correct deformities, regain the function of the knee joint and relieve long-term pain.² TKA is a major surgery that requires a physical, psychological and social preparation of the patients and therefore nurses should plan the patient care by evaluating the patient holistically in the preoperative period.^{3,4}

The goal of TKA is to eliminate pain, restore function with increasing movements, improve the deformity, and ultimately improve both the psychological and physical quality of life of the patient.^{1,4,5} Acute pain that is one of the most important complaints of the patients in the postoperative period begins with surgical trauma and decreases over time.^{2,6,7} However, the postoperative pain caused by TKA, which is known as one of the most painful surgical methods, disrupts the comfort of the patient and causes delay in mobilization and rehabilitation.^{8,9} Especially in patients with orthopedics and traumatology and thus the pain that cannot be relieved leads to an increase in the patient's anxiety level.¹⁰ In this context, effective pain and anxiety control can be achieved by active use of nursing process by means of providing individualized patient care to patients with postoperative pain and anxiety. In order to reduce the pain and anxiety levels of patients in the postoperative period, non-pharmacological methods (imagination, music therapy, distraction, reflexology) as well as pharmacological treatments (analgesics, anti-inflammatory) are used.^{6,8,11-13} Reflexology, one of the complementary treatment methods, can be applied to reduce anxiety, fatigue and tension, regulate the functioning of the sympathetic and parasympathetic systems, and relieve joint pain, depression, anxiety, migraine, headaches, constipation, indigestion, some urinary system problems, and nausea and vomiting.^{14,15} When the literature was examined, it was determined that as a result of reflexology applied for an average of 30 minutes, the level of pain and anxiety of the patients decreased in the early period.¹⁵⁻¹⁷ There is no study in the literature on the application of reflexology, one of the methods used by nurses to reduce pain and anxiety, to orthopedic patients.

AIM

The aim of this study was to examine the effect of foot reflexology on pain, anxiety and mobility in patients

undergoing knee arthroplasty. It is thought that the results obtained from the study will guide the management of pain, anxiety and mobilization, which is an important problem for orthopedics and traumatology nurses.

Research questions/hypothesis

- H_{1.1}: Foot reflexology is effective in reducing pain in patients with knee arthroplasty.
- H_{1.2}: Foot reflexology is effective in reducing anxiety in patients with knee arthroplasty.
- H_{1.3}: Foot reflexology is effective in increasing mobility in patients with knee arthroplasty.

METHODS

Study Design and Sample

An experimental study was conducted to determine the effect of foot reflexology on pain and anxiety in patients with total knee arthroplasty. The population of the study included patients who have been admitted to orthopedics and traumatology clinic at a training and research hospital between 09.10.2017 and 23.02.2018 and were subjected to TKA. The sampling included patients who have experienced total knee arthroplasty for the first time, 18-year-old or older, and had not previously received foot reflexology therapy. These patients also must not suffer from any cognitive, affective and verbal communication problems that would prevent the understanding of the given information and the ability to express pain, anxiety, and verbal communication accurately. Besides, these patients must have no complications (fever, infection, etc.) before, during and after 3 days. The sample size was calculated by using a G*Power 3.1 packet program in the study.¹⁸ As a result of the power analysis, it was determined that a total of 100 patients were included in the experimental and control groups at a level of $\alpha = 0.05$ and 90% power, 95% confidence interval. During the study period, a total of 203 patients underwent total knee replacement surgery. 85 patients were excluded from the study because they were operated on by different physicians and 10 patients were excluded because they had revision surgery. The study sample was determined by block randomization to include the experimental or control groups. Patients who had surgery one week were included in the experimental group, and those who had surgery the following week were included in the control group. Patients in the experimental and control groups were randomized according to gender and included in the groups. For this reason, 8 female patients were not included in the study. In order to avoid bias in the study results, data regarding pain, anxiety and mobility after reflexology application were evaluated by another nurse, independent of the researcher.

Data Collection Tools

Data were collected using the patient identification form, visual analogue scale (VAS) pain form, BECK anxiety scale, patient mobility scale, observer mobility scale, and patient mobilization questionnaire.

Patient Information Form: It was prepared by the researchers based on the literature.^{9-11,13,16,19} In this form, there are 7 questions about the patient's personal information (age, sex, educational status, marital status), the patient's place of residence, chronic illness, and hospitalization procedures.

Visual Analogue Scale (VAS) Pain Form: In this study, the pain level, the most intense pain level during the day, and the level of pain during mobilization were examined by means of a visual analogue scale. VAS is a measurement tool that is frequently used to convert data that cannot be quantified. The patients were asked to mark their pain on a 100 mm line.²⁰

BECK Anxiety Scale: The scale was developed by Beck et al. in 1988 to separate anxiety from depression and to evaluate the severity of the anxiety symptoms. The scale consists of 21 items that examine the anxiety symptoms and it is scored on a Likert-type scale of 0-3. The high scores of the scale indicate the severity of the anxiety. The validity and reliability of the scale for Turkey in 1998 was carried out by Ulusoy et al. The Cronbach's alpha internal consistency score of the scale was 0.93²¹, and the internal consistency value calculated for the whole scale was found to be 0.82 from the data obtained within the scope of this study.

Patient Mobility Scale: The Patient Mobility Scale was developed by Heye et al. in 2002. In the scale, 4 activities were performed after surgery and experiencing pain and the difficulty level of movement under each activity are evaluated. The increased score indicates increased pain and a difficulty with respect to the activity. The Turkish validity-reliability study of the Patient Mobility Scale was conducted by Ayoğlu (2011) on general surgery patients, and the internal consistency value of Cronbach alpha was determined as 0.90.²² In this study, Cronbach alpha value was found to be 0.76.

Observer Mobility Scale: The scale was developed by Heye et al. in 2002. During the four physical activities specified in the patient mobility scale after the patient's surgical procedure, the dependence- independence status / grade was scored between 1-5 by an observer. The total score of the scale was obtained by summing the scores related to four activities. The total scores taken from the scale were between 4-20, whereby the high scale scores indicate an

inadequate mobility of the patients. The Turkish validity-reliability study of the Observer Mobility Scale was conducted by Ayoğlu (2011) and the internal consistency value of Cronbach alpha was found to be 0.73.²² In this study, the internal consistency value calculated for the whole scale was found to be 0.65.

Patient Mobilization Questionnaire: In this form, the patient's postoperative standing time, the desire to stand up due to pain on the foot (0-10 visual analogue scale), the number of mobilizations during the day and the pain level during mobilization were evaluated.

Protocol: All patients were operated by the same physician under the spinal anesthesia. As a standard protocol for pain control of patients, the patient-controlled analgesia (5 ampoules pethidine hydrochloride, 0.9% NaCl in 100 ml) was used for the first 24 hours after surgery. In addition, 3×100 mg paracetamol infusion and 2×75 mg diclofenac sodium intramuscular administration were administered during the daily hospitalization. No analgesic application was made to the patients participating in the study other than the treatment protocol. The patients were not mobilized for the first 24 hours after surgery. The researchers received the diploma of Expert Reflexologist from the International Institute of Reflexology (Document date: 30.05.2017, Document No: 2017/3005, Issue: 0.096.191).

Application of the Research

Pain, anxiety, patient mobility scale, and observer mobility scales were collected by a nurse other than the researcher in order to avoid any bias and to make blind evaluations. When the effect of the spinal anesthesia on the day of the operation exceeded, the first interview was given to the patients in both experimental and control groups and the part of the data collection form regarding the patient introduction was completed after obtaining the consent of the patient.

Afterwards, in the experimental group, the first reflexology application (6 hours after surgery) was performed. Before reflexology application, VAS pain scale was applied to the patients. In the reflexology application, the right foot decreases the activation of the sympathetic nervous system and the left foot activates the parasympathetic nervous system, thus affecting the patient's pain and anxiety levels. For this reason, 20 minutes to the right foot and 10 minutes to the left foot were applied for a total of 30 minutes. The first 5 minutes of the session was dedicated to warming, loosening, and getting ready for the massage, while the remaining time was devoted to stimulating the reflex points related to pain and anxiety. The termination of the massage was achieved by repeating

the relaxation exercises. After application, the patient was administered to a VAS pain scale with questions about pain, and then the BECK anxiety scale was administered. After 24 hours application, the patient was re-interviewed, and the reflexology was performed again. VAS pain scale was applied before and after each reflexology application. After the application, the BECK anxiety scale were applied, and then the patient was mobilized, whereby the Patient Mobility Scale, the Observer Mobility Scale, and the mobilization questionnaire were applied. The application was repeated on the 2nd day of surgery. The reflexology sessions were applied to the experimental group patients once every 24 hours for 3 days.

The first interview was conducted with the patients in the control group at the 6th postoperative hour, whereby prior information was given about the research, and after obtaining the consent, the part of the data collection form regarding the patient presentation was completed. Then, a VAS pain scale and the BECK anxiety scales were applied by a nurse other than the researchers. After 24 hours, the VAS pain scale and the BECK anxiety scale were re-applied on the patients and the patients were mobilized. Then, the Patient Mobility Scale, the Observer Mobility Scale, and the patient mobilization questionnaire were applied. The patients were interviewed once every 24 hours. The data collection form was evaluated for 3 days.

Statistical Analysis

The data obtained from the study were evaluated using SPSS 20 (IBM SPSS Corp., Armonk, NY, USA). The distributions of variables were given by using mean, standard deviation, median, percentage and frequency values. The suitability of the repeated measures for the variance analysis was evaluated by Mauchly's Sphericity Test and Box-M Variance Homogeneity Test. When comparing the means, the repeated measures variance analysis was used as one of the factors in the factorial order. In multiple comparisons, the Adjusted Bonferroni Test was applied. Shapiro Wilk's and Levene Test were used to determine the homogeneity of the variances from the normal distribution. Comparisons between two groups were made using the Student's test for a parametric distribution and Mann Whitney-U test for nonparametric variables. The t test was used when the parametric test preconditions were provided, and the Mann Whitney-U test was used if not. The relationship between the variables was evaluated with Spearman Correlation Coefficient for nonparametric variables. The categorical data were analyzed by Fisher's Exact Test test. For the significance level of the tests, $P < .05$ was accepted.

Ethical Considerations

Prior to the implementation of the study, the approval was obtained from Karabuk University Non-Interventional Clinical Research Ethics Committee (date:31.05.2017, 77192459-050.99/428466). In order to carry out the study in the hospital, the permission of the General Secretariat of Public Hospitals Association was obtained (88919140/604.99). The study design and intervention techniques were explained to each patient, who then signed an informed consent. This study was conducted in accordance with the principles set out in the Declaration of Helsinki.

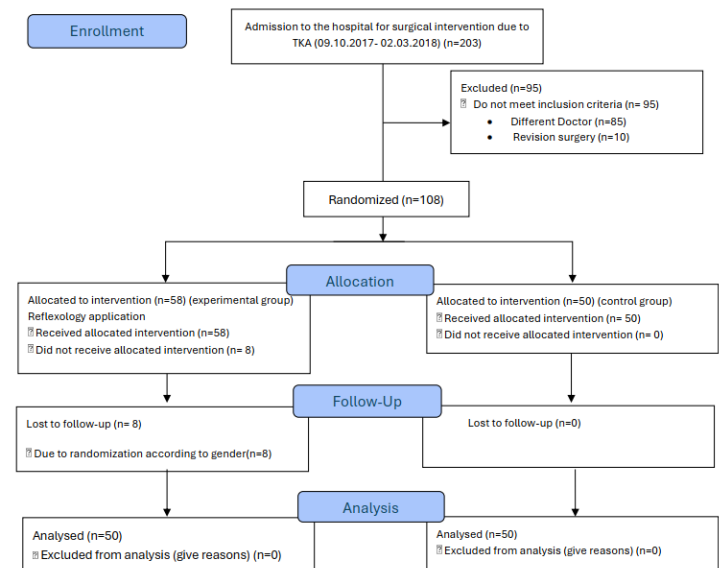


Figure 1. The CONSORT Flow Diagram of the Groups Enrollment, Allocation, Intervention, Follow-Up, and Analysis

RESULTS

Table 1 presents the socio demographic characteristics of the patients. The mean age of the patients in the experimental group was 64.8 ± 7.86 and the mean age of the patients in the control group was 66.24 ± 7.29 . In the experimental and control groups, 86% of the patients were female. By examining the table, it was found that 72% of the patients in the experimental group and 88% of the patients in the control group had a chronic disease. These results show that in both groups, the individuals are homogeneous apart from the chronic disease. The homogeneity of the groups is thought to be important for determining the effectiveness of reflexology.

Table 2 shows the distribution of the mean VAS pain scores levels of the patients in the experimental group. When the VAS pain scores level of the patients in the experimental groups were evaluated, statistically significant difference

Table 1. Socio-demographic Characteristics of the Patients (n= 100)

Socio-demographic characteristics	Experimental Group (n=50)		Control Group (n=50)		Statistical analysis	
Age (year)						
Mean±SD	64.8±7.86		66.24±7.29		1.212*	.331
Gender	n	%	n	%	t/ χ^2	P
Female	43	86.0	43	86.0	0.088**	.766
Male	7	14.0	7	14.0		
Marital status						
Married	45	90.0	41	82.0	1.329**	.766
Single	5	10.0	9	18.0		
Education status						
illiterate	13	26.0	15	30.0	0.507**	.616
Literate	14	22.0	8	16.0		
Primary School	21	42.0	26	52.0		
Secondary school graduate and above	2	4.0	1	2.0		
Job status						
Housewife	42	84.0	40	80.0	0.271**	.603
Other***	8	16.0	10	20.0		
Chronic disease						
Yes [□]	36	72.0	44	88.0	4.00**	.046
No	14	28	6	12.0		

[□]Diabetes, Hypertension *t-test (Student's t test); **Fisher's Exact Test

Table 2. VAS Pain Scores of the Patients in the Experimental Group According to the Follow-up (n = 50)

Follow up	0.Day Mean±SD	1.Day Mean±SD	2.Day Mean±SD	Statistical analysis (F [□] /P)
Pain Score				
Before application	8.24±1.70	5.32±1.89	4.32±1.37	12.457/.004**
After application	4.86±2.22	2.40±2.11	1.26±1.22	6.345/.02**
Statistical analysis t/P	4.589/.004**	5.877/.002*	6.997/.001*	

* P values (P< .01). ** P values (P< .05). *** Student's t test

[□] Repeated measures analysis variance was applied.

was found between the follow-up (P< .01; P< .05). It was found that post-reflexology pain scores of patients decreased.

Table 3 shows the distribution of mean VAS pain scores of the patients in the experimental and control groups according to the follow-up. When the mean pain scores of the patients in the experimental and control groups were examined, it was found that the mean scores of the patients in the experimental groups decreased and the difference between groups was statistically significant (P< .05; P< .001).

Table 4 shows the distribution of the mean BECK anxiety levels of the patients in the experimental and control groups. When the BECK anxiety level of the patients in the experimental and control groups were evaluated in-group, no statistically significant difference was found between the follow-up (P> .05). When compared with the control group, the mean anxiety scores of the patients in the experimental group were lower than the control group, and the difference between groups was statistically significant (P< .05).

Table 3. Distribution of VAS Pain Scores of the Patients in the Experimental and Control Groups According to the Follow-up (n = 100)

	0.Day	1. Day	2. Day	P
Experimental Group	4.86±2.22 ^a	2.4±2.11 ^a	1.26±1.22 ^a	.02**
Control Group	8.20±1.32	5.64±1.80	5.26±1.78	.005
Statistical analysis t/P	4.72/.003*	3.96/.047*	7.56/.001**	

*P values (P< .05). **P values (P< .01). *** Student's t test ^aMean pain score after reflexology

Table 4. Distribution of Beck Anxiety Overall Mean Scores of the Experimental and Control Groups According to the Follow-up

	Day of Surgery	Postoperative Day 1	Postoperative Day 2	F/P
Experimental Group	23.38±2.39	23.02±2.22	22.10±1.12	2.207/.227 ^a
Control Group	29.58±5.54	29.40±5.55	28.22±4.19	0.998/.632 ^a
Statistical analysis	644.50 ^ψ .04*	558.50 ^ψ .039*	4.552 ^Ω .035*	

* P values (P< .05). ^Ω Student's t test ^ψ Mann-Whitney- U ^a Repeated measures analysis variance was applied.

Table 5 presents a comparison of the mean scores from the patient mobility scale and the observer mobility scale based on the follow-up of patients in both the experimental and control groups. It was found that the mean scores of the patient mobility and the observer mobility scale of the experimental group patients decreased, and this difference was statistically significant (P< .05; P< .001).

Table 6 shows the relationship between the pain scores and the number of mobilizations on the first and second day of the experimental and the control groups. Only a statistically significant negative correlation was found between the pain on the second day and the number of mobilizations on the second day (r = -0.340, P= .016). When the pain score of the experimental group decreased compared with the follow-up, the number of mobilizations increased.

Table 5. Comparison of Patient Mobility Scale and Observer Mobility Scale Mean Scores of the Experimental and Control Groups According to the Follow-up (n = 100)

	Patient Mobility Scale	
	Mean $\pm$ SD	
	Postoperative Day 1	Postoperative Day 2
Experimental Group	38.34 $\pm$ 12.73	30.42 $\pm$ 8.78
Control Group	61.56 $\pm$ 18.95	53.1 $\pm$ 15.01
Statistical analysis t [□] /P	5.700/ .001**	2.719/ .009*
	Observer Mobility Scale	
	X $\pm$ SD	
	Postoperative Day 1	Postoperative Day 2
Experimental Group	6.85 $\pm$ 2.73	4.60 $\pm$ 1.14
Control Group	10.70 $\pm$ 3.03	8.02 $\pm$ 2.28
Statistical analysis t/P	6.037/ .001**	4.931/ .001**

* P values (P< .05) ** P values (P< .001) □ Dependent t-test was applied.

Table 6. The Relationship Between the Mean Number of Mobilization and Pain Scores on the First and Second Postoperative Day of the Patients in the Experimental and Control Groups

			Mobilization Number	
			Postoperative Day 1 (r/P)	Postoperative Day 2 (r/P)
Experimental Group	Pain	1. Day	0.030 / .834	-0.039 / .790
		2. Day	-0.191 / .184	-0.340 / .016
Control Group	Pain	1. Day	-0.235 / .100	-0.116 / .421
		2. Day	-0.260 / .069	-0.067 / .643

* P< .05 ** P< .001 r: Spearman Correlation Coefficient

DISCUSSION

After performing the total knee arthroplasty surgery, among the primary goals of the nursing care is to provide the individual with the highest level of independence to prevent complications and maintain the pain and anxiety management effectively in order to ensure the patient's satisfaction to perform the daily living activities. In this domain, nurses, who are an indispensable member of the health team, have an effective role in the postoperative period. Based on reviewing the literature, orthopedic patients felt high levels of pain in the first 3 days after surgery as well as experienced anxiety and compliance with prosthesis.^{2,13,23} Therefore, this study aimed at evaluating the effectiveness of foot reflexology, which is one of the non-pharmacological methods in alleviating and reducing the level of pain and anxiety during the postoperative period.

One of the most common problems experienced by patients undergoing surgical intervention in the

postoperative period is pain.³ In the prospective cohort study by Gerbershagen et al.⁷ on 115,775 patients which were evaluated at the first postoperative day in terms of pain severity, the highest pain score was found in orthopedic patients. In the current study, the mean pain level of the patients in the experimental group before the application on the surgery day was 8.24 $\pm$ 1.70, while the patients in the control group were found to be 8.20 $\pm$ 1.32. Despite the multimodal analgesia protocol, the patients in this study had severe pain. In this study, it was found that the mean pain score decreased after reflexology and this decrease was statistically significant. This result shows the importance of the present study since no previous study has followed the application of reflexology in TKA patients. Kukimoto et al.²⁴, meta-analysis study, reported that massage therapy has a short-term positive effect in a postoperative pain management and may be a part of multi-model pain management. In another randomized controlled study that examined the effect of reflexology on abdominal pain and anxiety after abdominal hysterectomy, a statistically significant reduction in pain and anxiety levels was found in patients after reflexology.¹⁷ In addition, in a study examining the effect of reflexology on pain and sleep quality in patients with rheumatoid arthritis, they found that the pain level of patients in the experimental group decreased.²⁵ Taking into consideration the findings of all these studies, it can be reported that foot reflexology can be used as a supportive in coping with postoperative pain, and the results of this study may contribute to the nursing literature.

Another finding of the present study revealed that the mean postoperative pain score of the patients in the control group decreased compared to the follow-up (8.20 $\pm$ 1.32; 5.64 $\pm$ 1.80; 5.62 $\pm$ 1.78) and the difference was statistically significant. This represents the most important problem of patients in the postoperative period pain. Starting with surgical trauma, it can be explained as progressive reduction.^{2,6} It can be said that reflexology application is effective in reducing pain in patients with total knee arthroplasty. By comparing the pain scores of the experimental and control group patients, it was found that the pain scores of the patients in the experimental group decreased. This finding confirms the H1.1 hypothesis.

The patient perceives anesthesia, surgical intervention and postoperative pain as a hazard, and both pre- and post-operative anxiety occur with this perception.^{13,26,27} Based on reviewing the literature, it was found that reflexology has been used as an effective complementary treatment for reducing the anxiety levels.^{18,28} According to the theory of perception of nerve receptors reflexology application,

the reflex regions of the feet affect the organs and organs are established between the reflex regions. It is argued that with the help of neurons, related organs are stimulated, creating relaxation and comfort, and this relaxation affects the autonomic response, endocrine, immune and neuropeptide system.²⁹ In the present study, it was found that the mean anxiety score of the patients in the experimental group decreased compared to the patients in the control group, and this decrease was statistically significant ($P < .05$). In the literature, the effect of reflexology on anxiety was examined, and it was found that reflexology was effective in reducing the anxiety experienced by patients.^{18,27,30} Similarly, in this study, foot reflexology can be reported to be effective in reducing the anxiety. Reducing the anxiety experienced by patients and improving their quality of life are among the primary responsibilities of nurses due to their caregiving role. It is thought that reflexology reduces the anxiety level in patients undergoing total knee arthroplasty and that reflexology can be included in routine nursing practices if supported by similar studies. This finding confirms the H1.2 hypothesis.

Efficient nursing care is required to reorganize the postoperative deteriorated homeostasis to prevent early diagnose of the surgical complications and maintain normal functioning of all systems. In this regard, one of the most important parameters of effective nursing care is moving the patient to the extent that she/he can tolerate and encouraging him/her to do active and passive exercises.^{31,32} Yolcu et al.³³ discovered that patients experienced varying degrees of difficulty with movement during the postoperative period, requiring increased support and encouragement, particularly when standing and walking. In the present study, when the postoperative 1st and 2nd day mobility of the patients was evaluated, it was found that the main patient mobility scale score of the experimental group patients was significantly lower than the control group. The increased score indicates increased pain and a difficulty with respect to the activity. Evaluation of the patients' mean scores on the observer mobility scale revealed that the control group had significantly higher scores, with the difference being statistically significant ($P < .05$). As the mean scores of the observer mobility scale of the patients increased, their dependence on the mobility increased. In the study, it was determined that the mobility of the experimental group increased compared to the control group. In this regard, it can be said that foot reflexology increases the mobility level of patients. This finding confirms the H1.3 hypothesis.

Limitations

The universe of the study was limited to patients who applied to the Orthopedics and Traumatology Clinic of Karabuk University Training and Research Hospital. The fact that the study sample consisted of patients who underwent knee arthroplasty surgery performed by the same physician, so that there were no differences in treatment protocol and surgical practice, can be considered as a strength of the study. Since total knee arthroplasty surgery is more common in female patients and the number of men and women could not be equalized, the high number of female patients can be considered as a limitation of the study. The fact that the research results only represent the group that received reflexology after knee arthroplasty can be considered a limitation of the study.

It is observed that especially after TKA operations, which is a large and painful surgical procedure, patients' movements and their quality of life due to pain are negatively affected. In this study, it was found that foot reflexology is an effective method in reducing pain and anxiety in patients with knee arthroplasty, and the mobility level and mobilization numbers of patients who underwent reflexology were higher. Finally, it is recommended to conduct experimental and qualitative studies on the effects of reflexology on patients undergoing total knee replacement surgery. In addition, long-term follow-up studies will contribute greatly to this field.

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Association between Polypharmacy and Depression, Anxiety and Stress in Elderly: A Cross-Sectional Study

Yaşlılarda Polifarmasi ile Depresyon, Anksiyete ve Stres Arasındaki İlişki: Kesitsel Bir Çalışma

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ABSTRACT

Objective: This study aimed to examine the association between polypharmacy and depression, anxiety and stress in elderly.

Methods: This cross-sectional study was conducted with 396 elderly admitted to two different hospitals in a province in eastern Türkiye. Information Form and Depression Anxiety Stress Scale-21 were used to collect data. The data were obtained between August and September 2023.

Results: Polypharmacy was present in 43.7% of the elderly. In the study, it was determined that income status (OR=0.385; 95% CI=0.163-0.909, $P=.029$), hypertension (OR=3.899; 95% CI=1.606-9.466, $P=.003$), coronary artery disease (OR=6.677; 95% CI=2.620-17.020, $P=.001$), diabetes (OR=3.924; 95% CI=1.543-9.981, $P=.004$), lung disease (OR=8.893; 95% CI=2.909-27.180, $P<.001$), hyperlipidemia (OR=20.023; 95% CI=5.737-69.887, $P<.001$), kidney disease (OR=16.514; 95% CI=5.873-46.431, $P<.001$), thyroid disease (OR=7.213; 95% CI=2.255-23.079, $P<.001$), cancer (OR=24.783; 95% CI=6.755-90.933, $P<.001$) and thinking that they were using too much drug (OR=0.484; 95% CI=0.233-1.005, $P=.052$) were significant risk factors for polypharmacy. It was observed that the presence of depression, anxiety and stress was not a significant risk factor for polypharmacy in the elderly ($P>.05$).

Conclusion: Further study on association between polypharmacy and depression, anxiety and stress in elderly is necessary. In future studies, it is recommended to use more comprehensive measurement tools, to evaluate which group the medicines used by the elderly belong to and to test causality.

Keywords: Polypharmacy, depression, anxiety, stress, elderly.

ÖZ

Amaç: Bu çalışmanın amacı yaşlılarda polifarmasi ile depresyon, anksiyete ve stres arasındaki ilişkiyi incelemektir.

Yöntemler: Bu kesitsel çalışma, Türkiye'nin doğusundaki bir ilde iki farklı hastaneye başvuran 396 yaşlı ile gerçekleştirilmiştir. Veri toplamak için Bilgi Formu ve Depresyon Anksiyete Stres Ölçeği-21 kullanıldı. Veriler Ağustos ve Eylül 2023 tarihleri arasında elde edilmiştir.

Bulgular: Yaşlıların %43,7'sinde polifarmasi mevcuttu. Çalışmada gelir durumu (OR=0,385; %95 GA=0,163-0,909, $P=.029$), hipertansiyon (OR=3,899; %95 GA=1,606-9,466, $P=.003$), koroner arter hastalığı (OR=6,677; %95 CI=2,620-17,020, $P<.001$), diyabet (OR=3,924; %95 CI=1,543-9,981, $P=.004$), akciğer hastalığı (OR=8,893; %95 CI=2,909-27,180, $P<.001$), hiperlipidemi (OR=20,023; %95 CI=5,737-69,887, $P<.001$), böbrek hastalığı (OR=16,514; %95 CI=5,873-46,431, $P<.001$), tiroid hastalığı (OR=7,213; %95 CI=2,255-23,079, $P<.001$), kanser (OR=24,783; %95 GA=6,755-90,933, $P<.001$) ve çok fazla ilaç kullandığını düşünme (OR=0,484; %95 GA=0,233-1,005, $P=.052$) polifarmasi için anlamlı risk faktörleriydi. Yaşlılarda depresyon, anksiyete ve stres varlığının polifarmasi için anlamlı bir risk faktörü olmadığı görülmüştür ($P>.05$).

Sonuç: Yaşlılarda polifarmasi ile depresyon, anksiyete ve stres arasındaki ilişki üzerine daha fazla çalışma yapılması gereklidir. Gelecekteki çalışmalarda daha kapsamlı ölçüm araçlarının kullanılması, yaşlıların kullandıkları ilaçların hangi gruba ait olduğunun değerlendirilmesi ve nedenselliğin test edilmesi önerilmektedir.

Anahtar Kelimeler: Polifarmasi, depresyon, anksiyete, stres, yaşlı

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INTRODUCTION

The proportion of elderly population has increased worldwide.¹ Increasing proportion of elderly population increases the load of chronic diseases and health expenditures.² The fact that elderly tend to suffer from multiple chronic diseases compared to younger people.^{3,4} causes them to require more drugs,⁴ and polypharmacy, which is defined as the use of multiple drugs.⁵

Although no definite consensus has been reached on the concept of polypharmacy,^{2,6} and the threshold amount is accepted as 5 drugs.^{2,7} Polypharmacy is a growing geriatric health problem worldwide.^{6,8} Polypharmacy leads to various problems^{6,9} and these problems may cause worse outcomes in elderly individuals.⁶ Elderly people who use more than one medication have a lower quality of life due to reduced activities of daily living.³ Polypharmacy has been associated with malnutrition, weight loss, treatment non-compliance, adverse drug events, falls, fractures, disability, frailty, depression,⁸ and multiple geriatric syndromes.² Given the serious outcomes and economic burden of polypharmacy,⁵ which has major negative consequences for patients, the healthcare system, and society, there has been a growing effort and interest in understanding its associations with mental health.¹⁰

The aging of the global population has created a great concern for the high prevalence of mental disorders or psychological problems in the elderly.¹¹ Approximately 14% of individuals aged 60 years and over live with a mental disorder¹² and with depression, anxiety and stress being most common in elderly.¹¹ Depression is a condition associated with psychosocial aspects and chronic stress rather than a genetic component in the elderly.¹³ Anxiety occurs in the elderly due to the changes experienced with the aging process.¹¹ Stress is seen in elderly not only due to stress factors in life, but also due to permanent decline in functional abilities and capacities, chronic pain, frailty or impaired mobility, grief, isolation, loneliness,¹⁴ chronic diseases, economic problems, major life changes such as retirement, care responsibilities and losses.¹⁵

Since mental disorders are more prevalent in elderly with both polypharmacy and chronic diseases,⁷ it is essential to carry out studies that address polypharmacy and related conditions in the elderly.⁸ In the literature, there are various studies^{9,10,16-19} in which the association between polypharmacy and depression in the elderly has been explored. In addition, there are a limited number of studies^{7,17,19} in which the association between polypharmacy and anxiety in the elderly has been examined. However, there is no study on the association between polypharmacy and stress.

AIM

This research aimed to examine the association between polypharmacy and depression, anxiety and stress in elderly.

Research questions

In this research, answers to the following questions were sought:

- What is the level of polypharmacy in the elderly?
- What are the factors affecting polypharmacy in the elderly?
- Is there an association between polypharmacy and depression in the elderly?
- Is there an association between polypharmacy and anxiety in the elderly?
- Is there an association between polypharmacy and stress in the elderly?

METHODS

Study Design

This study had a cross-sectional design and was reported based on the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist.

Setting and Sample

This study was carried out with elderly who applied to two different hospitals in a city in eastern Türkiye for any reason. The inclusion criteria were to be literate enough to fill out the forms used in the study, being aged 65 and over, and not having hearing/vision problems that would prevent them from responding to the forms. The sample size was calculated with the formula used for an unknown population ($n = p \cdot q \cdot t^2 / d^2$). In the study by Sofulu and Karadakovan² the rate of polypharmacy in individuals aged 65 and over was found to be 46.3%. Based on this study, the minimum sample size was calculated as 381 at $P = .46$, $q = 0.54$, a confidence interval of 95%, $d = 0.05$, and $t = 1.96$.

Data Collection

An Information Form and Depression Anxiety Stress Scale-21 were used to collect data. The data were obtained between August and September 2023. Initially, 400 elderly participated in the study. However, due to missing data from 4 individuals, the study was completed with 396 elderly. The flow chart is summarized in Figure 1.

Information Form: The form was created by the researchers by reviewing the literature^{2,4,6,17} and consisted of 12 questions.

Depression Anxiety Stress Scale-21 (DASS-21): The scale was developed by Lovibond & Lovibond by shortening DASS-42. The Turkish validity of the scale was tested by Saricam.²⁰ The four-point Likert-type scale includes three subscales, depression, stress, and anxiety, each including 7

questions. A score of 5 or above on the depression subscale, 4 or above on anxiety, and 8 or above on stress indicates that the individual has the relevant problem. In the validity study of the scale, the Cronbach alpha was found to be $\alpha=0.87$ for depression, $\alpha=0.85$ for anxiety, and $\alpha=0.81$ for stress.²⁰ In our study, Cronbach's alpha was 0.80 for the total scale, 0.58 for depression, 0.58 for anxiety and 0.55 for stress.

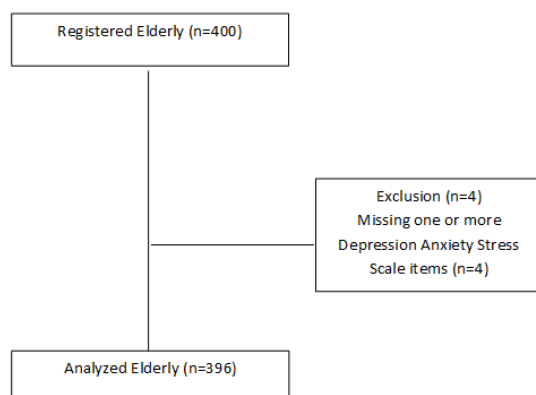


Figure 1. Flowchart of the study group

Data Analysis

The data obtained in the study were analyzed in the SPSS 25.0 (IBM SPSS Corp., Armonk, NY, USA) program. Descriptive statistical methods (number, percentage, minimum-maximum, and mean and standard deviation) were used in data analysis. The fitness of the data to normal distribution was checked with the Kolmogorov-Smirnov test. The Mann Whitney U test was used to compare quantitative data between two independent groups for non-normally distributed data. Chi-square analysis was performed to test the relationship between categorical variables. For statistically significant variables, the enter model was used in logistic regression. When interpreting the results, $P<.05$ was accepted for the significance level of statistical tests.

Ethical Considerations

Ethics approval for the research was obtained from Kafkas University Faculty of Health Sciences Noninvasive Research Ethics Committee (Dated 02/02/2023, Document ID: 81829502.903/30). Institutional permissions were obtained in writing from the state hospital and health, research and application center before data collection. Permission was obtained from the author of the scale used as a data collection tool in the study via e-mail. The study was conducted in line with the Declaration of Helsinki. In addition, the purpose of the study was explained to the elderly and their informed consent was obtained.

RESULTS

The mean age of the elderly who participated in the study was 76.38 ± 7.58 . Of the elderly, 53.0% were male; 57.3% were married; 33.1% were primary school graduates; 34.6% lived in the county; 48.2% lived with partners; 47.0% had moderate income; 76.0% had social insurance; 41.1% perceived their health status as moderate; 56.3% used 0-4 drugs; 56.8% thought they use too much drug (Table 1).

In the study, there was a statistically significant difference in the presence of polypharmacy according to health status perception, income status, having hypertension, coronary artery disease, diabetes, lung disease, hyperlipidemia, kidney disease, thyroid disease, cancer, and thinking that they use too much drug (Table 2) ($P<.05$).

Table 1. The General Characteristics of Elderly (n=396)

Variables	n	%
Age	76.38±7.58* (min: 65–max: 97)	
Gender	Female	186
	Male	210
Marital status	Single	32
	Married	227
	Divorced/ widowed	137
Education	Literate	110
	Primary school	131
	Middle school	95
	University	60
Living place	Village	127
	County	137
	City	132
Lives at home with	Alone	94
	Partner	191
	Children	98
	Nursing home	13
Income status	Poor	111
	Moderate	186
	Good	99
Social insurance	Yes	301
	No	95
Health status perception	Very poor	9
	Poor	80
	Moderate	163
	Good	118
	Very good	26
Number of drugs used	0-4	223
	5+	173
Perception of too much drug use	Yes	225
	No	171

*Mean, SD; Standard Deviation, min; Minimum, max; Maximum

Table 2. Comparison of elderly general characteristics and polypharmacy states

Variables		Polypharmacy is absent (0–4 medications)		Polypharmacy is present (≥5 medications)		X ²	P
		n	%	n	%		
Gender	Female	99	44.4	87	50.3	1.359	.244
	Male	124	55.6	86	49.7		
Marital status	Single	18	8.1	14	8.1	0.221	.895
	Married	130	58.3	97	56.1		
	Divorced/widowed	75	33.6	62	35.8		
Education	Literate	62	27.8	48	27.7	4.628	.201
	Primary school	71	31.8	60	34.7		
	Middle school	49	22.0	46	26.6		
Living place	University	41	18.4	19	11.0	0.651	.722
	Village	68	30.5	59	34.1		
	County	80	35.9	57	32.9		
Lives at home with	City	75	33.6	57	32.9	6.204	.102
	Alone	58	26.0	36	20.8		
	Partner	113	50.7	78	45.1		
Income status	Children	47	21.1	51	29.5	11.017	.004*
	Nursing home	5	2.2	8	4.6		
	Poor	48	21.5	63	36.4		
Social insurance	Moderate	112	50.2	74	42.8	5.154	.272
	Good	63	28.3	36	20.8		
	Yes	171	76.7	130	75.1		
Health status perception	No	52	23.3	43	24.9	44.507	<.001*
	Very poor	2	0.9	7	4.1		
	Poor	27	12.1	53	30.6		
Hypertension	Moderate	87	39.0	76	43.9	41.234	<.001*
	Good	83	37.2	35	20.2		
	Very good	24	10.8	2	1.2		
Coronary artery disease	Yes	59	26.5	101	58.4	12.677	<.001*
Diabetes	Yes	39	17.5	57	32.9	20.704	<.001*
Lung disease	Yes	49	22.0	75	43.4	18.511	<.001*
Hyperlipidemia	Yes	28	12.6	52	30.1	17.798	<.001*
Kidney disease	Yes	13	5.8	34	19.7	26.652	<.001*
Thyroid disease	Yes	26	11.7	57	32.9	19.158	<.001*
Cancer	Yes	22	9.9	46	26.6	23.858	<.001*
Perception of too much drug use	Yes	13	5.8	39	22.5	69.317	<.001*
	No	86	38.6	139	80.3		
		137	61.4	34	19.7		

Bold values denote statistical significance at the $P<.05$ level, X²: Chi-square test, * $P<.05$

Table 3. Comparison of depression, anxiety and stress states of elderly according to their groups

Variables		Polypharmacy is absent (0–4 medications)		Polypharmacy is present (≥5 medications)		Total		X ²	P
		n	%	n	%	n	%		
Depression	Yes	152	68.2	145	83.8	297	75.0	12.732	<.001*
	No	71	31.8	28	16.2	99	25.0		
Anxiety	Yes	201	90.1	161	93.1	362	91.4	1.065	.302
	No	22	9.9	12	6.9	34	8.6		
Stress	Yes	106	47.5	109	63.0	215	54.3	9.398	.002*
	No	117	52.5	64	37.0	181	45.7		

* $P<.05$, Bold values denote statistical significance at the $P<.05$ level, X²: Chi-square test,

In the study, among the elderly, 68.2% of those without polypharmacy and 83.8% of those with polypharmacy had depression. There was a statistically significant association between the elderly groups and the status of having depression (Table 3) ($P<.05$).

In the study, among the elderly, 90.1% of those without polypharmacy and 93.1% of those with polypharmacy had anxiety. There was no statistically significant association between the elderly groups and the status of having anxiety (Table 3) ($P>.05$).

In the study, among the elderly, 47.5% of those without polypharmacy and 63% of those with polypharmacy had stress. There was a statistically significant association between the elderly groups and the status of having stress (Table 3) ($P<.05$).

Based on the Enter model logistic regression analysis performed including the variables that were significant in the model established according to the presence of polypharmacy, the perception health status and the presence of depression and stress were not significant risk factors for polypharmacy ($P>.05$). Income status, presence of chronic diseases, and thinking that they use too much drug were significant risk factors for polypharmacy ($P<.05$). Elderly with an income less than their expenses were 0.39 times more likely to have polypharmacy than those with an

income equal to their expenses ($P=.029$, $OR=0.385$; 95% $CI=0.163-0.909$). Elderly with hypertension had a 3.9 times higher risk of polypharmacy than those without hypertension ($P=.003$, $OR=3.899$; 95% $CI=1.606-9.466$). Elderly with coronary artery disease had a 6.7 times higher risk of polypharmacy than those without coronary artery disease ($P<.001$, $OR=6.677$; 95% $CI=2.620-17.020$). Elderly with diabetes had a 3.9 times higher risk of polypharmacy than those without diabetes ($P=.004$, $OR=3.924$; 95% $CI=1.543-9.981$). Elderly with lung disease had an 8.9 times higher risk of polypharmacy than those without lung disease ($P<.001$, $OR=8.893$; 95% $CI=2.909-27.180$). Elderly with hyperlipidemia had a 20 times higher risk of polypharmacy than those without hyperlipidemia ($P<.001$, $OR=20.023$; 95% $CI=5.737-69.887$). Elderly with kidney disease had a 16.5 times higher risk of polypharmacy than those without kidney disease ($P<.001$, $OR=16.514$; 95% $CI=5.873-46.431$). Elderly with thyroid disease had a 7.2 times higher risk of polypharmacy than those without thyroid disease ($P<.001$, $OR=7.213$; 95% $CI=2.255-23.079$). Elderly with a cancer diagnosis had a 24.7 times higher risk of polypharmacy than those without a cancer diagnosis ($P<.001$, $OR=24.783$; 95% $CI=6.755-90.933$). Elderly who thought they use too much drug had a 0.5 times higher risk of polypharmacy than those who did not ($P=.052$, $OR=0.484$; 95% $CI=0.233-1.005$) (Table 4).

Table 4. Logistic regression model for polypharmacy

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Income status									
	Poor ^a			4.805	2	.091			
	Moderate	-0.956	0.439	4.74	1	.029	0.385	0.163	0.909
	Good	-0.857	0.536	2.562	1	.109	0.424	0.149	1.212
Health status perception									
	Poor ^a			1.934	3	.586			
	Moderate	-0.578	0.443	1.7	1	.192	0.561	0.235	1.338
	Good	-0.409	0.495	0.682	1	.409	0.664	0.252	1.754
	Very good	-0.997	1.214	0.674	1	.412	0.369	0.034	3.985
Chronic disease									
	Hypertension ^b	1.361	0.453	9.041	1	.003	3.899	1.606	9.466
	Coronary artery disease ^b	1.899	0.477	15.817	1	<.001	6.677	2.620	17.020
	Diabetes ^b	1.367	0.476	8.236	1	.004	3.924	1.543	9.981
	Lung disease ^b	2.185	0.57	14.696	1	<.001	8.893	2.909	27.180
	Hyperlipidemia ^b	2.997	0.638	22.081	1	<.001	20.023	5.737	69.887
	Kidney disease ^b	2.804	0.527	28.267	1	<.001	16.514	5.873	46.431
	Thyroid disease ^b	1.976	0.593	11.089	1	<.001	7.213	2.255	23.079
	Cancer ^b	3.21	0.663	23.426	1	<.001	24.783	6.755	90.933
Perception of too much drug use^c									
Scales									
	Depression ^b	-0.35	0.433	0.654	1	.419	0.705	0.302	1.646
	Stress ^b	0.009	0.358	0.001	1	.981	1.009	0.5	2.035
	Constant	-3.489	2.239	2.429	1	.119	0.031		

^aReference category, B; Unstandardized Beta, b: Yes, c: Yes, CI: Confidence Interval, Exp(B): Estimated relative risk (Odds ratio), SE; Standard Error,

DISCUSSION

Since mental disorders are more prevalent in elderly with both polypharmacy and chronic diseases,⁷ it is essential to carry out studies that address polypharmacy and related conditions in the elderly.⁸ This research aimed to examine the association between polypharmacy and depression, anxiety and stress in elderly. In our study, polypharmacy was present in 43.7% of the elderly. The frequency of polypharmacy in the elderly was found to vary between 2.1% and 72%.^{2,6,8,16,17,21} The prevalence of polypharmacy in the elderly varies.⁸ This may result from differences in sociodemographic characteristics, health systems,²¹ clinical practice guidelines, and definitions of polypharmacy.⁸ The high prevalence of polypharmacy in our study compared to some other studies may be due to factors such as the presence of chronic diseases in the elderly, the increase in the frequency of applying to the health system in our country in recent years, and differences in sociodemographic structures.

In the study, the risk of polypharmacy was found to be 0.39 times higher in the elderly whose income was less than their expenses compared to those whose income was equal to their expenses. In some studies,^{4,6,8} no significant relationship was found between income status and polypharmacy. In addition, Iqbal et al.²² found that lower socioeconomic status was associated with higher polypharmacy. Elderly individuals with poor socioeconomic status are more likely to have chronic diseases.²³ In the elderly, the increase in chronic diseases has been found to be associated with an increase in polypharmacy.^{4,6,21} Kizmaz et al.⁶ found that the prevalence of polypharmacy in those with at least one chronic disease (53.64%) was significantly higher than in those without chronic disease (5.48%). In our study, the slightly higher risk of polypharmacy in elderly individuals with an income less than expenses may be explained by the fact that chronic diseases and drug use were higher in elderly individuals with a low income compared to those with an income equal to expenses. However, it should be noted that elderly individuals with high socioeconomic status may also have more than one chronic disease, and their current socioeconomic sources and high level of access to health services may affect their drug use.²²

In the research, the risk of polypharmacy was 3.9 times higher in the elderly with hypertension, 6.7 times higher in those with coronary artery disease, 3.9 times higher in those with diabetes, 8.9 times higher in those with lung disease, 20 times higher in those with hyperlipidemia, 16.5 times higher in those with kidney disease, 7.2 times higher in those with thyroid disease, and 24.7 times higher in

those with cancer. In the literature, it was determined that polypharmacy was associated with chronic diseases.^{6,8}

In the study, the risk of polypharmacy was 0.5 times higher in the elderly who thought that they use too much drug. In the literature, there is no study in which the perception of drug use and polypharmacy in the elderly have been compared. In a study, the elderly were asked about their perception of polypharmacy and the elderly were divided into two categories: those who thought that 5 to 9 drugs were too many and those who thought that 10 drugs or more were too many. In the analysis conducted in the study, it was determined that those who thought that 10 drugs or more were too many used more drugs than those who thought that 5 to 9 drugs were too many.²⁴ One's thoughts and beliefs about medication and treatment have a significant impact on medication use.^{25,26} The elderly with polypharmacy may perceive taking a large number of drugs as a burden.²⁵ Nurses should be aware that the beliefs and perceptions of patients about medication will affect their medication use and should evaluate their beliefs and perceptions about medication.²⁶

In the first analysis performed in our study, the elderly with polypharmacy were found to have statistically significantly a higher level of depression compared to those without polypharmacy. However, in the regression analysis, it was found that the presence of depression was not a significant risk factor for polypharmacy. In the literature, there is conflicting evidence regarding the association between polypharmacy and depression. In some studies, conducted with the elderly,^{9,10,16-19} polypharmacy and depression were found to be significantly correlated. In a systematic review and meta-analysis study, it was found that an increase in the number of drugs used and polypharmacy were associated with an increased risk of depression.²⁷ Similar to our result, Van Wilder et al.²⁸ found that polypharmacy and depression were not associated in a study of 544 persons with chronic diseases. Little is known about the association between polypharmacy and depression in the elderly.¹⁸ This association has been attempted to be explained by the fact that depression accompanies chronic diseases that require the use of multiple drugs and that depression is more common in cases of multiple chronic diseases.¹⁷ However, there is conflicting evidence on this issue. Bazargan et al.¹⁶ reported that the presence of multiple diseases in the elderly completely mediated the association between polypharmacy and depression. On the contrary, in another study conducted with the elderly, no significant association was reported between the type and duration of chronic disease or drug use and depression levels.¹ In the elderly, depression may develop mostly in association with chronic distress, anxiety, marital status, grief, illness,

economic conditions, and various psychosocial factors.¹³ Furthermore, elderly are more likely to observe tangible physical deterioration and not express or ignore stressful situations, which may lead to the development of depression.²⁹ In the elderly with depression, the main symptoms of depression, such as low mood and lack of enjoyment of life, may not be as common as in younger adults.^{1,30} Since nervousness, anxiety,³⁰ and somatic symptoms are more common in the elderly compared to these symptoms,^{1,29,30} the diagnosis of depression may be overlooked.^{1,13} Another important point in this regard is the possibility that depression may occur due to the side effects of certain medications (some antihypertensive, antilipidemic, non-steroidal anti-inflammatory, antiviral, corticosteroids, etc.). Pharmacokinetic and pharmacodynamic changes that occur with age, the mechanisms of action of drugs and the doses of drugs used may trigger depression in the elderly. Especially in the elderly with polypharmacy, it is necessary to determine whether one of the drugs or medications used is the cause of depression.³¹

In the study, the presence of anxiety was not identified as a significant risk factor for polypharmacy. In the literature, there is conflicting evidence regarding the association between polypharmacy and anxiety. In some studies, conducted with the elderly,^{5,7} polypharmacy and anxiety were reported to be significantly associated. Similar to our finding, in some studies conducted with the elderly,^{17,19} polypharmacy and anxiety were found to be non-associated. The relationship between anxiety and polypharmacy has been one of the current research topics⁷ and the association between polypharmacy and anxiety have not yet been explained.¹⁷ The frequency of anxiety disorder due to medical illnesses is also increasing in the elderly.¹ The diagnosis of anxiety and related disorders in the elderly is difficult due to the tendency of the elderly to minimize anxiety symptoms and attribute them to physical illnesses, comorbidities that occur with aging, and cognitive decline.^{1,32} Moreover, symptoms of mental disorders in the elderly due to chronic diseases are considered normal symptoms of old age and anxiety is often seen together with depression, therefore the diagnosis may be overlooked.¹

In the first analysis performed in our study, it was determined that the elderly with polypharmacy had statistically significantly higher stress than those without polypharmacy. However, according to the regression analysis, the presence of stress was not found to be a significant risk factor for polypharmacy. In the literature, there is no study in which polypharmacy and stress in the elderly have been compared. The elderly, like people of all

ages, encounter not only life stressors but also stressors such as decreased functional ability and capacity.¹⁴ Especially gradual physical and psychological decline in old age can result in stress in the elderly.³³ One of the important causes of stress in the elderly is chronic diseases that significantly affect daily life.³³ Chronic diseases are long-term, usually slowly progressing diseases causing high rates of disability and death.³⁴ Elderly individuals tend to suffer from more than one chronic disease compared to younger people.^{3,4} The long-term³⁴ and increased need for more medication⁴ in the elderly with chronic diseases can cause an economic burden as well as various psychological problems, including stress term.³⁴ In the elderly, chronic diseases were found to be a significant risk factor for psychological distress, including stress.³⁴

Factors such as the individual characteristics of the study group, the measurement tool used, and the fact that the majority of the elderly (77.5%) perceived their health status as moderate/good/very good may have been effective in the lack of a significant association between polypharmacy and depression, anxiety, and stress in our study. In the elderly, it was reported that the frequency of chronic diseases and mental health symptoms was higher in those who perceived their health as poor compared to those who perceived their health as good.³⁵ Another factor that may be effective in the lack of significant association between stress and depression and polypharmacy in our research may be that the majority of the elderly who participated in this study were married (57.3%) and lived with their partners (48.2%). These rates suggest that social support may have a protective role. Huang et al.³⁶ found that loneliness was positively associated with perceived stress and depressive symptoms and that loneliness may affect depressive symptoms through perceived stress. In another study conducted by Son et al.³⁷ it was found that loneliness was associated with depression in elderly individuals and that spousal support could be effective in alleviating depression. In addition, the same study proved that social support has a protective effect on the association between loneliness and depression.³⁷

Strengths and Limitations

One of the strengths of our research is that to our knowledge, it is the first study in which the association between polypharmacy and stress in the elderly was examined. In addition, this study is among the limited number of studies in which the association between polypharmacy and depression and anxiety in the elderly has been examined. Our study has several limitations. Firstly, since our study was conducted in a single province, the results may not represent the general elderly population in Türkiye. In the study, data were collected

based on self-reports of the elderly, which may lead to a bias. Furthermore, since a cross-sectional design was used, it was not possible to establish a causal relationship. Finally, another limitation of this study is that the types of drugs used were not evaluated.

Polypharmacy was present in 43.7% of the elderly. It was observed that the presence of depression, stress and anxiety was not a significant risk factor for polypharmacy in the elderly. Although the conclusions of our study show that the presence of depression, anxiety and stress is not an important risk factor for polypharmacy in the elderly, considering the fact that the diagnosis of depression, stress and anxiety in the elderly is missed and these conditions are expressed/mixed with physical diseases, we recommend that elderly people with polypharmacy should be mental evaluated by nurses. In addition further study on association between polypharmacy and depression, anxiety and stress in elderly is necessary. In future studies, it is recommended to use more comprehensive measurement tools, to evaluate which group the medicines used by the elderly belong to and to test causality.

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Informed Consent: The purpose of the study was explained to the elderly participants and their informed consent was obtained.

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Automated Alerts Systems for Pediatric Sepsis Patients: A Systematic Review

Pediatrik Sepsis Hastaları için Otomatik Uyarı Sistemleri: Sistematik Bir Derleme

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ABSTRACT

Objective: Pediatric sepsis is difficult to identify due to subtle symptoms, and early aggressive management is crucial to prevent septic shock. Artificial intelligence can improve sepsis detection by triggering alerts based on patient data. No systematic review has yet discussed AI use for pediatric sepsis screening. This study aims to answer: "What tools alert healthcare providers to the onset of sepsis in pediatric patients in hospitals?"

Methods: The study protocol was registered with PROSPERO (CRD42023467930). We searched PubMed, ProQuest, ScienceDirect, Scopus, and EBSCO, focusing on pediatric hospital settings using tools for early sepsis detection, excluding studies on non-sepsis patients, and limiting inclusion to English literature reviews without a publication year restriction. The Joanna Briggs Institute (JBI) Appraisal Tool evaluated study quality, and findings were synthesized qualitatively.

Results: Out of 16 articles, four tools for automatic sepsis alerts in pediatrics were identified: Electronic Medical Records (EMR), Electronic Health Records (EHR), The Electronic Alert System (EAS), and The Newborn Cry Diagnostic System (NCDS). EHR is the most commonly used. These tools require various data, such as vital signs, lab results, skin condition, capillary refill, and even a baby's cry.

Conclusion: Automated sepsis alerts in pediatrics enhance diagnostic accuracy, expedite decision-making, and decrease sepsis-related mortality. Limitations include language restrictions and the inability to assess each tool's effectiveness or identify the optimal sepsis detection algorithm, underscoring the need for further research, including a meta-analysis.

Keywords: Pediatrics, sepsis, artificial intelligence.

ÖZ

Amaç: Pediatrik sepsis, belirtilerinin belirsizliği nedeniyle tanınması zor bir durumdur ve septik şoku önlemek için erken ve yoğun tedavi hayati önem taşır. Yapay zeka, hasta verilerine dayanarak uyarılar oluşturarak sepsis tespitini iyileştirebilir. Ancak, pediatrik sepsis taramasında yapay zeka kullanımını ele alan sistematik bir inceleme bulunmamaktadır. Bu çalışmanın araştırma sorusu: "Hastane ortamında pediatrik hastalarda sepsisin başlangıcını sağlık çalışanlarına bildirmek için hangi araçlar kullanılmaktadır?"

Yöntemler: Çalışma protokolü, PROSPERO numarası CRD42023467930 ile kaydedilmiştir. PubMed, ProQuest, ScienceDirect, Scopus ve EBSCO veritabanlarında, pediatrik hastane ortamında sepsisin erken tespiti için kullanılan araçlara odaklanarak arama yapılmıştır. Sepsis gelişmeyen hastaları içeren çalışmalar hariç tutulmuş, yalnızca İngilizce derleme makaleler dahil edilmiştir. Çalışma kalitesi, Joanna Briggs Institute (JBI) Değerlendirme Aracı ile değerlendirilmiş ve bulgular niteliksel olarak sentezlenmiştir.

Bulgular: Toplam 16 makaleden, pediatrik sepsis için otomatik uyarı sağlayabilecek 4 araç belirlenmiştir: Elektronik Tıbbi Kayıtlar (EMR), Elektronik Sağlık Kayıtları (EHR), Elektronik Uyarı Sistemi (EAS) ve Yenidoğan Ağlama Teşhis Sistemi (NCDS). En sık kullanılan araç EHR'dir. Bu sistemler, hayati belirtiler, laboratuvar sonuçları, cilt durumu ve bebeğin ağlaması gibi çeşitli verilere ihtiyaç duyar.

Sonuç: Otomatik uyarı sistemleri, tanı doğruluğunu artırır, karar verme sürecini hızlandırır ve çocuklarda sepsisle ilişkili ölüm oranlarını azaltır. Dil sınırlamaları ve araçların etkinliğini değerlendirme konusundaki yetersizlikler, daha fazla araştırmaya ihtiyaç olduğunu göstermektedir.

Anahtar Kelimeler: Pediatri, sepsis, yapay zeka.

INTRODUCTION

Lately, clinical and health research has found that sepsis has remained the key cause of pediatric mortality in hospitals.¹ Sepsis can be defined as a systemic infection associated with some organ dysfunction, caused by a dysregulated host response to the infection.^{2,3} In general, the fundamental difference in the condition of pediatrics sepsis lies in the difficulty of recognition or signs of symptoms.⁴ Globally, sepsis causes mortality and morbidity in pediatrics or children, with around 22 cases of pediatric sepsis per 100,000 person-years and around 1.3 million cases of neonatal sepsis per 100,000 live births per year.^{5,6} Recent studies found that in developed countries, the pediatric mortality caused by sepsis is up to 50%, whereas in high-income countries, 3–7% of pediatrics with sepsis die, with mortality rates increasing up to 20% in the Pediatric Intensive Care Unit (PICU).⁷

Sepsis conditions should be threatened by aggressive management to improve outcomes and prevent sepsis shock.⁸ Unfortunately, until now the treatment of sepsis in children is still based on guidelines for the treatment of sepsis in adults.⁹ This complex condition in pediatrics can be reduced by early diagnosis and timely intervention with antibiotics, vasoactive medications, and resuscitation.¹⁰ Early diagnosis of sepsis in pediatrics has been studied. Alerts based on clinical physiologic data embedded in an electronic health record system have been studied as potential methods to facilitate sepsis recognition in pediatrics.¹¹ Artificial intelligence can be included to potentially activate the sepsis alert based on the patient's data on the Electronic Health Records (EHR).¹² Besides that, any tools and machine learning can also be the tools for sepsis alert used for pediatrics in hospitals.^{13,14}

AIM

This systematic review is used to learn about any tools used to alert to sepsis conditions in pediatrics in the hospital setting. We will see the data used for automated alert systems in the hospital to diagnose sepsis in pediatric patients accurately, support sepsis treatment and management, and analyze patient outcomes after the tools were used.

METHODS

Type of Study

The type of this study is a systematic review using PRISMA Guidelines.¹⁵ Figure 1 shows the PRISMA flow diagram of the study. We used PICO's (patient, intervention, comparison, outcome) framework to clearly define the research question of this study with population (pediatrics

with sepsis), Intervention (artificial intelligence), Comparison (none), and Outcome (decision support systems). The study protocol was registered in PROSPERO with the number CRD42023467930.

Search Strategies

We searched PubMed, ProQuest, ScienceDirect, Scopus, and EBSCO on December 02, 2024, with no time restriction. We comprehensively searched the database to identify informatics tools used for early sepsis detection in pediatrics. We searched using keywords that were developed based on our questions with the MeSH Term (pediatrics) AND (early diagnosis OR early warning score OR decision support systems, clinical OR machine learning OR artificial intelligence) AND (sepsis OR neonatal sepsis), the search strategies can be seen in the supplementary data 1. We exported all identified records to the Rayyan.ai program, which was used to screen the articles and determine which studies to include or exclude in the review. We also conducted hand searches in Google Scholar by reviewing related references from articles that met the inclusion criteria, using the same keywords, with the last update on May 19, 2024.

Eligibility Criteria

In this review, the inclusion criteria of the studies were: (1) pediatric only populations (< 18 years old), male and female, (2) Neonatal Intensive Care Unit (NICU), PICU, or emergency setting, (3) tools to detect sepsis or screening or early warning, (4) Patients with undetected sepsis, protocols, reviews, ongoing clinical trials, meta-analyses, conference posters or proceedings, and letters to the editor were all excluded. (5) Only full-text articles with English language.

Data Extraction

Seven authors (DDSAD, S, TR, MUN, NCS, FRC, AHS) were independent reviewers and did screening with Rayyan.ai data management. All the included studies were extracted to sheets individually by AHS, S, DDSAD, FRC, NCS. A formal discussion was conducted to discuss the different perspectives on the data collection and extraction done by the reviewer. The extracted final data of the study were (author's name, year of publication, title, country, study methods, unit/department, tools, data screening, result, and quality assessment). Table 1 summarizes the 16 studies that use and compare the effectiveness of manual and electronic sepsis alerts in pediatrics.

Quality Assessment

After the included study was agreed upon by all authors, two primary reviewers (NCS, MM and TR) used the

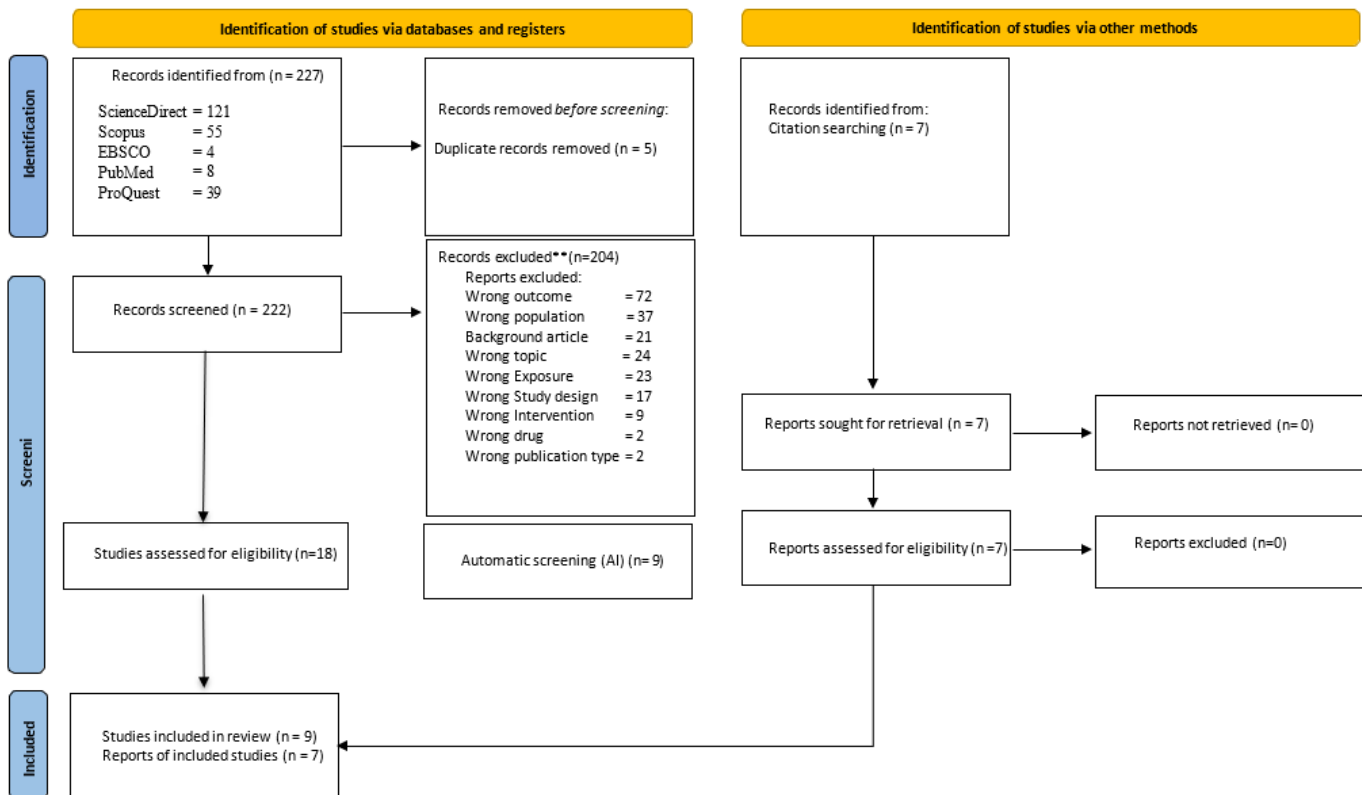


Figure 1. PRISMA Flow Diagram

methodological quality assessment using Joanna Briggs Institute (JBI) for 14 cohort studies and two quasi-experimental. The critical appraisal tools provided by JBI aid in evaluating the reliability, applicability, and outcome of published studies. Two primary reviewers (NCS and TR) independently scored each of the cohort and experimental studies, obtaining a final decision to include the study. Differences between analysts were settled by other commentators (AHS, S, DDSAD, FRC, NCS, AAP, MM), and the outcomes were reached through mutual agreement. Based on the assessment results, articles included in this study must meet the minimum standards for article assessment more than 50%.

RESULTS

Study Quality

Based on the results of the article quality analysis, 10 articles were very good and met all points in the quality assessment tools with JBI. One article was 91% complete, two articles were 82% complete, one article was 73% complete, one article was 64% complete, and one article was 54% complete. Data on quality appraisal is included and can be seen in Table 1.

Characteristics of Included Studies

Early detection of sepsis is significant for handling sepsis,

mainly in severe sepsis. Since 2014, according to the article we found, efforts have been made to detect early severe sepsis in children. The use of EHR, Electronic Medical Records (EMR), Electronic Alert System (EAS), and Newborn Cry Diagnostic System (NCDS), based on the journals we found above, is used in countries that have advanced technology such as the United States of America (USA) and the states of the USA. The average number of samples using the EHR was 1,214 participants, the average using the EMR instrument was 44,579 participants, the EAS was 48,197 participants, and the NCDS was 53 participants (Table 1).

Use of EHR for Sepsis Detection in Pediatric

EHR is More Effective

In seven articles that use EHR with automated screening tools, the focus of these studies is comparing automatic and manual screening tools, automatic screening tools are faster,^{16–21} more accurate,^{17,19,20} more just accurate¹⁶ and more thoroughly, specificity 91.8%, sensitivity 72%²², so it is more effective. By detecting sepsis more quickly in children, sepsis control can be carried out more quickly, so that septic shock can be prevented.

EHR is More Comprehensive

Apart from being more effective, this automatic screening tool from the HER can be used in both the

Table 1. Overview Characteristics of Included Study

No	Author's name Year	Country	Study methods	Unit	Tools	Data Screening	Result	Quality Assessment
1	Lloyd et al. ¹⁶ , 2018	United State of America	Cohort Study	ED	EHR	Tachycardia, Temperature abnormality, Skin abnormality, Capillary refill abnormality, High-risk condition, Concern for infection/ temperature abnormality, Hypotension, Pulse abnormality	As accurate as manual screening Identifies 68 minutes faster than manual	91%
2	Eisenberg et al. ¹⁸ , 2021a	United State of America	Cohort Study	ICU & ED	EHR	Temperature, white blood cells, heart rate, respiratory rate	Detect sepsis with greater accuracy Identify sepsis 59 minutes faster than manual	100%
3	Depinet et al. ²¹ , 2022	United State of America	Cohort Study	ICU & ED	EHR	Fever/ hipotermia, hypertension, Tachycardia, Tachypnea, skin turgor, mental status, pulse, skin	Rate of administration of antibiotics for 60 minutes (47% fulfilled 50% fulfilled)	100%
4	Le et al. ¹⁹ , 2019	United State of America	Retrospective Cohort Study	ICU & ED	EHR	Age, blood pressure, heart rate, oxygen saturation, Glasgow Coma Scale (GCS) status, white blood cells.	Can recognize sepsis early and more accurately	100%
5	Dewan et al. ²⁰ , 2020	United State of America	A prospective cohort study	PICU	EHR	Body temperature, blood test	Faster and more precise sepsis screening	73%
6	Eisenberg, et al. ²² , 2019	United State of America	Retrospective cohort study	ICU & ED	EHR	Vital signs (body temperature, heart rate, respiratory rate)	Can detect sepsis more quickly and accurately (91.8% specificity and 72% sensitivity)	54%
7	Eisenberg et al. ¹⁷ , 2021b	United State of America	Retrospective cohort study	Pediatric ED	Automated Sepsis Screening Tools	Body temperature, leucocyte count, heart rate, respiratory rate, cardiac dysfunction, one or more organ dysfunction	The tool can detect sepsis more quickly and thoroughly (sensitivity increased from 64% to 84.6%)	100%
8	Tabaie et al. ¹³ , 2021	United States of America	Retrospective Cohort Study	Inpatient	EMR	Blood test	Can predict the onset of sepsis in children with a central venous line 8 hours before the clinical team takes blood cultures.	100%
9	Sepanski et al. ²³ , 2014	United States of America	Retrospective Cohort Study	ICU & ED	EMR	Blood test and vital signs	The average time for application of the screening tool before revision took 10.3 (before revision) and 11.1 hours (after revision).	100%
10	Stinson et al. ²⁵ , 2019	United State of America	Retrospective Cohort Study	Inpatient & ED	EMR	Vital sign, capillary refill, mental status and abnormalities of pulses and skin condition	Implementation of an EMR-based sepsis recognition tool resulted in a diagnostic or therapeutic intervention with a management time of 24.4 minutes.	82%

Table 1. Overview Characteristics of Included Study (Continued)

No	Author's name Year	Country	Study methods	Unit	Tools	Data Screening	Result	Quality Assessment
11	Xiang et al. ²⁴ , 2021	China	A single center retrospective study	Hospital	EMR	Vital signs and blood test and laboratory data (c-reactive, protein level, and neutrophil count)	Existing tools for detecting septic shock are Extreme Gradient Boosting (XGBoost), Septic shock early warning (SSEW), and pediatric Sequential Organ Failure Score (pSofa). AI-SSEW has proven to be more effective and accurate in detecting septic shock in children.	100%
12	Balamuth et al. ¹¹ , 2017	United State of America	Cohort Prospective Study	ED	Electronic Alert Improves Pediatric Sepsis Recognition	Tachycardia or hypotension, fever or hypothermia or risk for infection.	Electronic sepsis alert implementation increased ED sepsis detection from 83% to 96%	100%
13	Kamaleswaran et al. ¹² , 2018	United State of America	Observational cohort study	PICU	Electronic Screening Algorithm Alert	Pulse, oxygen saturation (SpO2) and blood pressure (systole and diastole)	Effectively detect severe sepsis 8 hours faster than an algorithm using real-time electronic screening.	82%
14	Gibbs et al. ²⁶ , 2021	United State of America	Experiment Study	Hospital	Electronic sepsis alerts	Temperature, blood pressure, respiratory, pulse, capillary refill, skin appearance, high of consciousness, high risk condition, fluid bolus	There was a decrease in the sepsis mortality rate in children after implementing the use of Electronic Sepsis Alert, namely at 3 days 2.53 compared to 0% and 30 days 3.8 compared to 1.3%.	100%
15	Alturki et al. ²⁷ , 2022	Saudi Arabia.	Retrospective cohort study	PICU	EAS	Vital sign, initial laboratory values, time to start antibiotics, need for inotropic support and laboratory result	Application of EAS sepsis can detect sepsis. The median time to receive antibiotics from EAS triggers was shorter at 39 minutes (23%).	64%
16	Matikolaie & Tadj ¹⁴ , 2022	Canada	Experiment study	Hospital	NCDS	Identify sick infants from healthy ones includes cleft palate, hearing disorder, hyperbilirubinemia, autism, asphyxia, hypothyroidism, and respiratory distress Identify the reason the baby cry, mother's gestational age, baby's weight, Apgar score, gender, baby's age, type of disease.	Using Support Vector Machine (SVM), which counteracts the baby's crying signal called Cry Audio Signal (CAS). The best F-score value with 86% on expiratory data. Quadratic discriminant produces the best F Score with 83.90% for inspiration.	100%

EAS; Electronic Alert System, ED; Emergency Department, EHR; Electronic Health Record, EMR; Electronic Medical Record, ICU; Intensive Care Unit, NCDS; Newborn Cry Diagnostic System PICU; Pediatric Intensive Care Unit,

Pediatric Emergency Department (PED), Intensive Care Unit (ICU)/ PICU, both special children's hospitals and general hospitals. The dataset included in the EHR is data found after the nurse or doctor has carried out an assessment. The data screened for early detection of sepsis varies from article to article, including tachycardia, tachypnea, temperature abnormality, skin abnormality, capillary refill abnormality, high-risk condition, concern for infection/ temperature abnormality, Hypotension/ hypertension, pulse abnormality, white blood cells, mental status, Age, blood pressure, oxygen saturation, Glasgow Coma Scale (GCS) status and one or more organ dysfunction.

EHR is More Recommended and Widely Used

Of the 16 articles we reviewed, EHRs were most used to facilitate automated screening tools. The dataset in the EHR that is needed to detect early sepsis is general data that is documented based on the results of the nurse/doctor's assessment.

Use of EMR for Sepsis Detection in Pediatric

The results of 4 journals using EMR show that 3 journals use blood culture measurements, with blood tests,¹³ with blood tests and vital signs,²³ and blood test and laboratory data (c-reactive, protein level, and neutrophil count)²⁴ while one journal uses measurements of vital signs, capillary refill, mental status, and abnormalities of pulses, and skin condition²⁵. Seven of the four studies, three of them showed the effectiveness of using blood culture in detecting sepsis within a time span of 4 to 24 hours.

Use of EAS for Sepsis Detection in Pediatric

Tachycardia or hypotension, fever or hypothermia or risk for infection.¹¹ EAS uses pulse, Spo2, blood pressure (systole and diastole).¹² A sepsis score calculated using the parameters vital signs, heart rate, blood pressure, respiratory rate and temperature, skin perfusion characteristics, capillary refill, pulse quality, neurological assessment, and history or presence of high-risk conditions,²⁶ vital signs at hospital admission, initial laboratory values, start time for antibiotics, need for inotropic support.²⁷ The results of four journals show that this measurement is effective in detecting sepsis quickly with a sensitivity of more than 80%.

Use of NCDS for Sepsis Detection in Pediatric

The results of the systematic review carried out show that there is a unique variation that is used as a type of non-invasive tool used to detect sepsis. The NCDS uses a Support Vector Machine (SVM), which counteracts the baby's crying signal called the Cry Audio Signal (CAS).¹⁴ This research conducted in Canada used the well-known MFCC (Mel Frequency Cepstral Coefficients) features and

prosodic features of slope, rhythm, and intensity including SVM, decision trees, and discriminant analysis. Research conducted before, found that babies suffering from septic disease cried differently compared to healthy babies through this experiment. In an effort to detect sepsis, NCDS also requires other data such as the baby's health condition and the presence of disorders (hearing, respiratory, cleft lip, cleft palate), reasons for the baby's crying, birth weight, APGAR (Appearance, Pulse, Grimace, Activity, Respiration) score, gender, age, type of disease, and age. maternal pregnancy.¹⁴ NCDS has been used successfully in efforts to recognize sepsis only in newborns. However, various difficulties were expressed, such as differences in the rhythm of babies' cries for different needs.¹⁴

Data Used for Automatic Sepsis Alert

The use of data in sepsis screening for pediatric patients is very dependent on the algorithm used and specified in the selected tools. Various variations are found depending on the tools used.

Data Used for the EHR

Electronic Health Records were developed and used as a sepsis screening tool or for early detection of sepsis in pediatrics. Some of the data used include vital signs such as tachycardia/ heart rate,^{16–19,21,22} blood pressure,^{16,19,22} tachypnea/ respiratory rate,^{16–18,21,22} pulse abnormality,^{16,21} Body temperature/ Temperature abnormality,^{16–18,20–22} skin/ skin turgor/ skin abnormality,^{16,21} capillary refill/ abnormality capillary refill,¹⁶ high risk condition,¹⁶ white blood cells,^{17–19} and mental status/ GCS status,^{19,21} blood test,²⁰ and cardiac dysfunction or more organ dysfunction.¹⁸

Data Used for EMR

Electronic Medical Records were also developed and used as a tool in developing pediatric sepsis screening in hospitals. It has been reported that several data are used to detect the incidence of sepsis in children, including blood tests,^{13,23,24} vital signs,^{23–25} capillary refill time,²⁵ mental status,²⁵ skin condition,²⁵ blood test and laboratory data.²⁴

Data Used for EAS

The Electronic Alert System is a system that was built and developed to become a tool in pediatric sepsis screening, with the data needed, namely vital signs such as pulse,^{11,12,26,27} oxygen saturation,^{12,27} blood pressure,^{12,26,27} temperature,^{26,27} respiratory,^{26,27} capillary refill time,²⁶ skin appearance,²⁶ initial laboratory values such as fluid bolus,^{26,27} high of consciousness,²⁶ needs for inotropic support and laboratory result,²⁷ time to start antibiotics,²⁷ and risk for infection.¹¹

Data Used for NCDS

The NCDS is a diagnostic system developed by several researchers. The use of Machine Learning to detect newborn babies' cries is called SVM, which counteracts the baby's crying signal called CAS. This tool identifies babies with a cleft palate, hearing disorders, hyperbilirubinemia, autism, asphyxia, hypothyroidism, and respiratory distress. Identify the cause of the baby's crying, namely the mother's gestational age, baby's weight, APGAR score, gender, the baby's age, and type of disease.¹⁴

DISCUSSION

Impact of Automatic Sepsis Alert

The results of this systematic review have had a very significant impact on reducing the severity of sepsis in pediatrics through early detection of sepsis in children in hospitals in several countries. The positive impact is detecting sepsis earlier,^{12,13,16–20,22} being more accurate,^{11,12,17–20,22,24,27} carrying out earlier treatment and administering more effective antibiotics to reduce the number of deaths caused by sepsis in pediatrics.^{21,26} These results are in line with other systematic reviews that state that the main advantages of using an automatic alerting system in the management of sepsis include reducing the death rate with better sepsis management including faster and more effective administration of antibiotics.^{28,29} Good management of sepsis was revealed as one of the advantages of using automatic sepsis alerts which were stated in other studies to be effective in speeding up sepsis detection compared to manual methods.^{29,30} In its use, the automatic system alert is very dependent on the type, data used (algorithm) and sensitivity of the tool in optimizing the work of the automatic sepsis alert in detecting sepsis events in hospitals.³¹

This systematic review produces the important point that it turns out that the development of EHRs to increase sepsis screening is more effective and is more widely used in various countries.^{16–21} Other research was found in line with these findings, where EHR management was suggested to be better in alerts, governance, alert metrics, initiating alert management programs, evaluating alert systems, and optimizing existing alerts to improve patient care and reduce the burden of vigilance on health workers.³² The use of EHR in practice can maintain and harmonize the relationship between the environment, human resources, workflow, policies, culture, and others so that its development will increase patient safety.^{33,34} Other research was conducted focusing on the use of EHRs in improving patient safety in treatment rooms in general, with the results of the review showing that the use of EHRs

is easy to modify as a support system for improving pediatric patient safety.³⁵

However, the application of EHR for developing automatic alerts in the clinical realm still has many limitations. A qualitative study shows good and positive adaptation in the use of EHR for health workers, however various improvements and further development of EHR are needed to increase the effectiveness of EHR use to improve patient safety.³⁴ Literature studies show various limitations of using EHR, including lack of harmony, problems in patient matching, the possibility of algorithm manipulation, increasing the burden on health workers, and still limited data on security and privacy concerns.³⁶ Developments related to the use of EHR really need to be carried out to determine various set points in automatic alerts.³⁷

Limitations of the study

This review has limitations, including the use of language, which is limited to English, and does not look further into the complete effectiveness of using each tool. Another limitation of this research is the inability to conclude an optimal algorithm for determining and detecting sepsis in children, so a meta-analysis needs to be carried out to answer and explain this. We still include the Critical Appraisal results of 55–65%, because this systematic review aims to carry out an in-depth investigation regarding the use of tools to detect sepsis in pediatric patients.

There are four tools developed for automatic sepsis alert for pediatric patients, namely EHR, EMR, EAS, and one study that uses NCDS. Three of the four tools have several indicators in common, namely vital signs such as body temperature, heart rate, blood pressure and breathing. One of the four tools uses a baby's cry as an indicator in detecting sepsis for children.

Etik Komite Onayı: PROSPERO (Date: 09/10/2023, number: CRD42023467930) kaydı yapılmıştır.

Bilgilendirilmiş Onam: Çalışmaya katılan öğrencilerin bilgilendirilmiş yazılı onamları alınmıştır.

Hakem Değerlendirmesi: Dış bağımsız.

Yazar Katkıları: Fikir- DDSAD; Tasarım – DDSAD ve S; Denetleme – AAPP ve MM; Kaynaklar-; Malzemeler – DDSAD, S, AHS, FRC, MUN, NCS, TR; Veri Toplanması ve/veya İşleme – DDSAD, AHS, FRC, MUN, NCS, TR; Analiz ve/veya Yorumlama – DDSAD, S, AHS, FRC; Literatür Taraması- S ve AHS; Makale Yazımı – DDSAD, AAPP, MM; Eleştirel İnceleme- AAPP ve MM.

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