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Research Article

Evaluation of Attitudes Towards Safe Use of Needle-Stick and Sharp Medical Instruments of Healthcare Workers in a Public Hospital

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Abstract

Objective: This cross-sectional and descriptive study was conducted to evaluate the attitudes of healthcare workers towards the safe use of needle-stick and sharp medical instruments.

Methods: The study was conducted cross-sectionally on 248 healthcare workers. Data were collected face-to-face using the "Healthcare Worker Identification Form" and the "Healthcare Workers' Attitude Scale Towards Safe Use of Needle-Stick and Sharp Medical Instruments".

Results: The total score and cognitive and affective subscale mean scores of the Attitudes Toward Safe Use of Needle-Stick and Sharp Medical Instruments Scale were statistically significantly higher in women than in men ($p<0.05$). The mean scores of healthcare workers who were having night shift were lower than those who were not having night shift ($p<0.05$). According to the results of linear regression analysis, gender, educational status, occupation, and exposure to injury were determined as factors independently affecting attitudes towards safe use of needle-stick and sharp medical instruments ($p<0.05$).

Conclusion: In this study, it was found that the attitudes of male healthcare workers, those who were having night shift, those who experienced sharps injuries, midwives and health officers towards safe use of needle-stick and sharp medical instruments were low. In line with these results, it is recommended to organize in-service training programs for the prevention of sharps injuries, to pay attention to standard prevention practices and to actively use the reporting system, taking into account the personal (gender) and professional characteristics of healthcare workers (occupation, having a needle-stick and sharp injury, postgraduate education status, having night shift, etc.).

Keywords: Attitudes, Healthcare Workers, Needle-Stick and Sharp Medical Iinstruments, Scale, Regression

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1. Introduction

Healthcare workers are exposed to many infections that can be transmitted from patients in the environment where they work. The most important risks are needle-stick as well as injuries and infections caused by sharp medical instruments (1,2). At least 20 different infectious agents may be transmitted to healthcare workers through direct contact with blood and bloody body fluids or through needle-stick and sharp medical instruments such as needles. Viruses take the first place when discussing these agents and the most common viruses are hepatitis B virus (HBV), hepatitis C virus (HCV) and “human immunodeficiency virus” (HIV) (3). Unlike the members of other professions, healthcare workers are more likely to face occupational risks due to the fact that they have to come into contact with sick and healthy individuals or the tissues/organs/extracts etc. of these individuals as well as the characteristics of the environment in which they work (4). Despite the studies conducted on this subject

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and precautions taken in this regard, the risk of transmission of infections through occupational contact still prevails (3).

The first data on injuries to healthcare workers caused by needle-stick and sharp medical instruments began to be collected by Mc Cormick and Maki in 1981 and injuries caused by needle sticks were first reported and recorded in 1986. In the study conducted by Mc Cormick and Maki, the incidence of sharp instrument injuries (including needle-stick injury) during medical interventions was found to be 69.6%. Authors recommend several protection strategies to prevent sharp instrument injuries (including needle-stick injury). These recommendations include training programs addressing healthcare personnel, avoiding the act of reattaching the needle cap after removal and improved and accessible waste management (5). Pursuant to the estimates of the American Center for Disease Control and Prevention (CDC), annually 385,000 personnel providing healthcare services in healthcare institutions are exposed to sharp instrument injuries (including needle-stick injury) and an average of 1000 needle-stick and sharp medical instrument injuries are reported everyday. In 1987, CDC delivered certain suggestions for preventing sharp instrument injuries (including needle-stick injury) to be implemented throughout the country. These suggestions include carefully handling and using needles and sharp medical instruments and the management of the wastes thereof (6,7).

Altıok et al. (8) reported that 79.1% of healthcare workers were injured with a needle-stick and sharp medical instrument at least once during their professional lives and 60.9% of these injuries were caused by medical instruments contaminated with blood. It was further reported that injuries caused by the syringe needle are frequently experienced while caring for the patient, trying to place the cap on the needle, withdrawing the needle from the syringe and disposing the needles into the waste bin. They also reported that the incidence of sharp instrument injuries is higher among nurses and midwives (83%), the majority of healthcare providers have been vaccinated against hepatitis B (79.5%), and only 12.7% of those who suffered an injury reported this injury. Özberk and Kutlu reported that the rate of exposure of healthcare workers to sharp instrument injuries (including needle-stick injury) over the last year was 15.5%. In the same study it was concluded that mean scores of physicians, nurses and healthcare officials in the Healthcare Workers' Attitude Scale Towards Safe Use of Needle-Stick and Sharp Medical Instruments were significantly higher compared to the hospital cleaning staff (9).

Among all healthcare professionals, nurses have been reported to be the group most likely to encounter infections that cause blood-borne diseases. Following the nurses, the groups with the highest rate of encountering infections are listed as physicians, dentists, auxiliary health care personnel and hospital cleaning staff. For the purpose of their study reviewing the sharp instrument injuries (including needle-stick injury) faced by healthcare workers working in a tertiary healthcare institution, Suntur and Uğurbekler (10) concluded that the occupational group most frequently exposed to such injuries is nurses with 35.6%, and the most important factor causing such injuries is the disposal of the needle tip following the invasive procedure. It was also reported that injuries mostly likely occur in clinics, intensive care units and operating rooms, respectively. There are studies in the literature examining the effects of some characteristics of nurses on the sharp instrument injuries whereby it was reported that nurses' characteristics such as age, gender, educational status, department/clinic they work in and their working experience affect their cognitive, affective and behavioral attitudes (11, 12, 21).

Minimizing the risks through precautions taken against sharp instrument injuries will enable healthcare personnel to perform their services in safe working conditions. Sharp instrument injuries and infections that may occur in the post-injury period can only be prevented by taking effective security policies and protective measures. Trainings to be provided on the subject should aim to raise awareness of all healthcare professionals and managers (3,13).

Healthcare workers are increasingly exposed to sharp instrument injuries (including needle-stick injury) in the institutions they serve and their risk of exposure to sharp instrument injuries is increasing everyday. In consideration of these data, this study was conducted to evaluate the attitudes of healthcare workers (physicians, nurses, midwives and health officers) towards the safe use of needles and sharp medical instruments as well as to determine the influencing factors.

1.2. Study questions

1. Is there a significant difference between the attitudes of healthcare workers towards the safe use of needles and medical instruments and the independent variables (age, gender, exposure to sharp instrument injuries etc.)?

2. Which factors affect healthcare professionals' attitudes towards the safe use of needles and sharp medical instruments?

3. What are the attitudes of healthcare professionals towards the safe use of needles and sharp medical instruments?

2. Method

2.1. Study design

The study was conducted cross-sectionally on 248 healthcare workers who worked in a public hospital in Silivri between January-March 2018 based on the permission provided by the Ethics Committee of a university hospital dated 16.08.2017 and issue no: 2017/205. The Principles of the Declaration of Helsinki and Publication Ethics was ensured for research purposes. Verbal consent was obtained from healthcare professionals who agreed to participate in the study. Healthcare professionals who agreed to participate in the study were informed that they had the right to withdraw from the study whenever they liked.

2.2. Population and sample of the study

The population of the study consisted of physicians, nurses, midwives and health officers working in a public hospital in Silivri. The forms/questionnaire used for the purpose of the study were filled out by volunteers in appropriate environments (outpatient clinic room, nurses' room etc.) in the departments/clinics where healthcare professionals were assigned. Data collection tools were generally administered to physicians between 15:00 and 17:00 hours on outpatient clinic days when the patient intensity was low. Forms were administered to nurses, midwives and healthcare officers during working hours and shifts when treatment and patient care were less intense. Data were filled in and questionnaires were collected within an average of 20 minutes.

No sampling method was applied in the study and physicians, nurses, midwives and health care officials who worked in the public hospital in Silivri throughout the dates when the study is conducted and who volunteered to participate in the study were included therein. 258 healthcare professionals working in the healthcare institution, including 64 attending physicians, 152 nurses, healthcare officers and 42 midwives, were included in the study and constituted the sample of the study. 248 (96%) healthcare professionals assigned in the hospital were reached within the scope of the study.

2.3. Data collection tools

The "Healthcare Worker Identification Form" was developed following the literature review. "Healthcare Workers' Attitude Scale Towards Safe Use of Needle-Stick and Sharp Medical Instruments" was used to determine the attitudes of healthcare workers towards the safe use of needles and sharp medical instruments.

Healthcare Worker Identification Form: Healthcare Worker Identification Form, developed by the authors in line with the literature research, includes 17 questions with sub-questions addressing the sociodemographic characteristics (age, gender, education status, occupation, working experience, the department being worked for, number of shifts, monthly working hours, daily sleep hours, injury caused by needles and sharp medical instruments, referral to the relevant department after injury, the reason of not referring to the relevant unit and status of having received training on injuries caused by needles and sharp medical instruments) of physicians, nurses, midwives and health officers who volunteered to participate in the study (8,13,14,15,16).

Healthcare Workers' Attitude Scale Towards Safe Use of Needle-Stick and Sharp Medical Instruments: The items of the scale developed to measure the attitudes of healthcare professionals towards the safe use of needles and sharp medical instruments have taken into account standard precautions and common injuries regarding the use of sharp medical instruments and was developed in line with these data. The 5-point Likert type scale, consisting of 25 items, was developed aiming to determine the Cognitive, Behavioral and Affective attitudes. Lower scores in the Attitude Scale indicate that the healthcare worker fails to use the needles and sharp medical instruments safely whereas higher scores indicate that the healthcare worker uses the needles and sharp medical instruments safely. The lowest and the highest total score that can be obtained from the attitude scale is 25 and 125, respectively. Scores of the sub-dimensions of the attitude scale can also be calculated. The highest score that can be obtained from the cognitive attitudes sub-dimension is 60 whereas the lowest score is 12. The highest score that can be obtained from the behavioral attitudes sub-dimension is 35 whereas the lowest score is 7. The highest score that can be obtained from the affective attitudes sub-dimension is 30 whereas the lowest score is 6. The validity and reliability of the scale was confirmed by Uzunbayır (14) in 2009. The Cronbach's alpha value of the original scale is 0.80. The Cronbach alpha value of the scale used in our study is 0.89.

2.4. Evaluation of data

NCSS (Number Cruncher Statistical System) 2007 (Kaysville, Utah, USA) (License No: 1675948377483; Serial No: N7H5-J8E5-D4G2-H5L6-W2R7) program was used for the statistical analysis of the data collected in the study. Study data were analyzed using descriptive statistical methods (mean, standard deviation, median, frequency, percentage, minimum and maximum). Whether the quantitative data were normally distributed or not was tested with the Shapiro-Wilk test and graphical analysis. Mann Whitney U test was used for pairwise group comparisons of quantitative variables that did not show normal distribution. Kruskal Wallis test was used for comparisons of three or more groups that did not show normal distribution and Bonferroni-Dunn Test was used for pairwise comparisons. The variables of gender, education, occupation, the department being worked for, having night shifts and exposure to sharp instrument injuries (including needle-stick injury), which are considered among the factors that have a significant or nearly significant effect on the attitudes towards the safe use of needles and sharp medical instruments were further analyzed by Enter and Backward Stepwise Regression analysis. In all analyses, $p<0.05$ was considered as statistically significant.

3. Results

Mean age of the participating healthcare workers was found to be 34.90±8.99, their mean working experience was 12.15±8.90 years, average number of night shifts per month was calculated as 6.92±3.2, and average daily sleep was found as 6.94±1.40 hours. 70.6% of the participants were female, 41.5% of those had bachelor’s degrees, 55.2% were nurses, 40.3% worked in internal medicine and 71.8% had night shifts (Table 1).

Table 1. Sociodemographic and Occupational Characteristics (n=248)

Sociodemographic Characteristics		n (%) or Mean±SD
Age (yrs)	Min-Max (Median)	20-65 (35)
	Mean±SD	34.90±8.99
Gender	Female	175 (70.6)
	Male	73 (29.4)
Education	Vocational High School Of Health Services	17 (6.9)
	Associate Degree	59 (23.8)
	Bachelor's Degree	103 (41.5)
	Post Graduate Degree	69 (27.8)
Occupational Characteristics		
Occupation	Physician	59 (23.8)
	Nurse	137 (55.2)
	Midwife	28 (11.3)
	Healthcare Officer	24 (9.7)
Working Experience (yrs)	Min-Max (Median)	0.1-39 (10)
	Mean±SD	12.15±8.90
Working Experience in the Healthcare Institution (yrs)	Min-Max (Median)	0.1-30 (4)
	Mean±SD	5.09±4.89
Department being worked for	Emergency Room	59 (23.8)
	Internal Medicine	100 (40.3)
	Surgery	35 (14.1)
	Operating Room	23 (9.3)
	Intensive Care	31 (12.5)
Having Night Shifts	Yes	178 (71.8)
	No	70 (28.2)
Number/Frequency of Night Shifts per month (n=178)	Min-Max (Median)	1-13 (8)
	Mean±SD	6.92±3.20
Working hours per month (n=233)	Min-Max (Median)	100-288 (176)
	Mean±SD	180.77±24.24
Sleeping Hours (hours)	Min-Max (Median)	2-15 (7)
	Mean±SD	6.94±1.40

It was determined that 55.6% of healthcare workers had never been injured by a needle-stick and sharp medical instrument whereas 44.4% had been exposed to an injury caused by a needle-stick and sharp medical instrument. It was further determined that 73.6% of the injured healthcare workers referred to the relevant departments, 51.7% of healthcare workers who were injured by a needle-stick and sharp medical instrument however did not refer to the relevant departments complained that they did not have enough time, the rate of healthcare workers trained on injuries caused by a needle-stick and sharp medical instrument were 86.3% and 50.5% of them evaluated the training they received as sufficient (Table 2).

Table 2. Exposure to Sharp Instrument Injuries and Training Received on this Issue (n=248)

Sharp Instrument Injuries	Category	n (%)
Sharp Instrument Injuries	Yes	110 (44.4)
	No	138 (55.6)
Referral to Relevant Departments in case of Injury	Yes	81 (73.6)
	No	29 (26.4)
Reasons for Not Referring to Relevant Departments in case of Injury (n=29)	Unaware of the Procedure/Protocol	4 (13.8)
	Lack of time	15 (51.7)
	Finding it useless/unnecessary	10 (34.5)
Received Training on Sharp Instrument Injuries	Yes	214 (86.3)
	No	34 (13.7)

Efficiency of the Training Received (n=214)	Quite Efficient	25 (11.7)
	Efficient	108 (50.5)
	Moderate	69 (32.2)
	Not Efficient	12 (5.6)

Although not presented in the table below, mean score of the "Cognitive Attitude" sub-dimension of the Healthcare Workers' Attitude Scale Towards Safe Use of Needle-Stick and Sharp Medical Instruments was 55.08±4.53, mean score of the "Affective Attitude" sub-dimension was 27.10±2.76, the "Behavioral Attitude" sub-dimension was 31.71±3.50 and the mean Total Score was 11.89±9.52.

No statistically significant difference was found in terms of the frequency of having night shifts when compared based on the occupation (p>0.05). A statistically significant difference was found in terms of the frequency of being exposed to sharp instrument injuries when compared based on the occupation (p=0.007). It was determined that midwives had the highest frequency of being exposed to injuries. The frequency of physicians being exposed to injuries were found to be lower compared to nurses and midwives. A statistically significant difference was found in terms of referral to the relevant departments after being exposed to an injury caused by needle-stick and sharp medical instruments when compared based on the occupation (p=0.033). It was determined that midwives had the highest frequency of referring to the relevant departments. The frequency of physicians referring to the relevant department were found to be lower compared to nurses and midwives. No statistically significant difference was found in terms of reasons for not referring to the relevant departments after being exposed to an injury caused by needle-stick and sharp medical instruments when compared based on the occupation (p>0.05). A statistically significant difference was found in terms of the trainings received on the sharp instrument injuries when compared based on the occupation (p=0.001). The frequency of nurses, midwives and health officers receiving trainings were found to be higher compared to the physicians. The highest frequency of receiving trainings pertained to the nurses whereas the lowest frequency of receiving trainings pertained to the physicians (Table 3).

Table 3. Evaluation of Having Night Shifts and Characteristics of the Sharp Instrument Injuries Based on Occupations (n=248)

Characteristics		**Occupation**				***p***
		Physician (n=59)	**Nurse (n=137)**	**Midwife (n=28)**	**Healthcare Officer (n=24)**	
Having Night Shifts	Yes	41 (69.5)	100 (73.0)	17 (60.7)	20 (83.3)	[A]0.317
	No	18 (30.5)	37 (27.0)	11 (39.3)	4 (16.7)	
Sharp Instrument Injuries	Yes	16 (27.1)	68 (49.6)	17 (60.7)	9 (37.5)	**[A]0.007****
	No	43 (72.9)	69 (50.4)	11 (39.3)	15 (62.5)	
Referral to Relevant Departments in case of Injury (n=110)	Yes	8 (50.0)	51 (75.0)	16 (94.1)	6 (66.7)	**[B]0.033***
	No	8 (50.0)	17 (25.0)	1 (5.9)	3 (33.3)	
Reasons for Not Referring to Relevant Departments in case of Injury (n=29)	Unaware of the Procedure/Protocol	1 (12.5)	2 (11.8)	0 (0)	1 (33.3)	[B]0.965
	Lack of time	4 (50.0)	9 (52.9)	1 (100)	1 (33.3)	
	Finding it useless/unnecessary	3 (37.5)	6 (35.3)	0 (0)	1 (33.3)	
Receiving training on injuries	Yes	36 (61.0)	130 (94.9)	26 (92.9)	22 (91.7)	**[B]0,001****
	No	23 (39.0)	7 (5.1)	2 (7.1)	2 (8.3)	
Efficiency of the Training Received (n=214)	Quite Efficient	8 (22.2)	13 (10.0)	2 (7.7)	2 (9.1)	[B]0.409
	Adequate	16 (44.4)	65 (50.0)	16 (61.5)	11 (50.0)	
	Moderate	11 (30.6)	46 (35.4)	6 (23.1)	6 (27.3)	
	Not Efficient	1 (2.8)	6 (4.6)	2 (7.7)	3 (13.6)	

Female participants' mean scores in the cognitive and affective attitudes sub-dimensions of the scale and mean total scores were found to be statistically higher compared to males (p<0.05). No significant

difference was found between the mean scores of the participants in the behavioral attitudes sub-dimension of the scale when compared based on gender (p>0.05). No significant difference was found between the mean total scores of the participants in the Healthcare Workers' Attitude Scale Towards Safe Use of Needle-Stick and Sharp Medical Instruments and its sub-dimensions when compared based on the age and education of the healthcare workers (p>0.05) (Table 4).

Table 4. Comparison of Healthcare Workers' Mean Total Scores in the Healthcare Workers' Attitude Scale Towards Safe Use of Needle-Stick and Sharp Medical Instruments and its Sub-Dimensions based on Sociodemographic Characteristics

Characteristics			**Healthcare Workers' Attitude Scale Towards Safe Use of Needle-Stick and Sharp Medical Instruments**			
			Cognitive Attitudes	**Affective Attitudes**	**Behavioral Attitudes**	**Total**
		n	**Mean±SD (Median)**	**Mean±SD (Median)**	**Mean±SD (Median)**	**Mean±SD (Median)**
Age (yrs)	**≤25 yrs**	**49**	54.78±5.07 (56)	27.20±2.89 (28)	31.41±3.73 (32)	113.39±10.65 (117)
	26-35 years	**80**	55.59±4.03 (56)	27.51±2.32 (28)	31.85±3.11 (33)	114.95±8.05 (116)
	36-45 years	**92**	55.25±4.49 (57)	27.03±2.90 (28)	32.02±3.47 (34)	114.30±9.48 (117)
	≥46 yrs	**27**	53.56±4.89 (54)	25.93±3.09 (26)	30.74±4.24 (31)	110.22±11.06 (112)
	[d]p		0.287	0.109	0.373	0.248
Gender	**Female**	**175**	55.55±4.03 (56)	27.49±2.40 (28)	32.03±3.13 (33)	115.07±8.34 (117)
	Male	**73**	53.95±5.41 (55)	26.18±3.32 (27)	30.92±4.19 (32)	111.04±11.47 (113)
	[c]p		**0.048***	**0.006****	0.102	**0.012***
Education	**Voc. High School of Health Sci.**	**17**	53.12±5.68 (54)	26.94±2.88 (28)	31.00±4.00 (31)	111.06±11.03 (113)
	Associate Degree	**59**	54.93±5.15 (57)	26.56±3.20 (27)	31.64±3.96 (33)	113.14±11.59 (118)
	Bachelor's Degree	**103**	54.78±4.42 (55)	27.12±2.65 (28)	31.26±3.55 (31)	113.16±9.33 (115)
	Post Graduate Degree	**69**	56.14±3.55 (57)	27.58±2.45 (28)	32.59±2.70 (34)	116.32±6.81 (118)
	[d]p		0.135	0.406	0.100	0.137

Mean: Mean, Standard Deviation

The variables of gender, education, occupation, the department being worked for, having night shifts and exposure to sharp instrument injuries (including needle-stick injury), which are considered among the factors that have a significant effect on the attitudes towards the safe use of needles and sharp medical instruments were further analyzed by Enter and Backward Stepwise Regression analysis. As a result of Enter regression analysis, independent factors affecting the attitudes were determined as gender and exposure to injury (p<0.01). As a result of Backward Stepwise regression analysis, independent factors affecting the attitudes were determined as gender, post graduate degree, occupation and exposure to injury (p<0.01). Attitudes of male healthcare workers towards the safe use of medical instruments were found to be lower (4.13 times) than women. Attitudes of healthcare workers with post graduate degrees towards the safe use of medical instruments were found to be higher (3.58 times) compared to others. The attitude levels of those who were healthcare officials were found to be lower (4.28 times) compared to those who were not healthcare officials (p<0.05). The

attitudes of those who were exposed to sharp instrument injuries towards the safe use of medical instruments were found to be lower (3.26 times) compared to those who have no such experience (p<0.01 (Table 5).

Table 5. Linear Regression Analysis of Factors Affecting Healthcare Workers' Attitudes Towards Safe Use of Needles and Sharp Medical Instruments

	Enter Method				**Backward Stepwise Method**			
		95.0% CI				**95.0% CI**		
Model	**B**	**Low**	**High**	***P***	**B**	**Low**	**High**	***p***
Gender (0:F; 1:M)	-4.136	-7.126	-1.146	**0,007****	-4.543	-7.237	-1.849	**0.001****
Education (Associate Degree)								
Voc. High School	-1.506	-6.608	3.596	0.561				
Bachelor's Degree	-0.974	-3.994	2.047	0.526				
Post Graduate Degree	2.717	-1.587	7.022	0.215	3.575	0.921	6.229	**0.008****
Occupation (Nurse)								
Healthcare Officer	-4.456	-8.961	0.048	0.052	-4.285	-8.456	-0.114	**0.044***
Midwife	-0.731	-4.583	3.120	0.709				
Physician	0.137	-4.111	4.386	0.949				
Department being worked for (Internal Medicine)								
Surgery	-1.866	-5.607	1.875	0.327				
Operating Room	0.093	-4.218	4.404	0.966				
Emergency Room	0.519	-2.662	3.701	0.748				
Intensive Care	2.832	-1.122	6.786	0.160				
Having Night Shifts	-1.805	-4.560	0.950	0.198				
Exposure to injuries	-3.260	-5.698	-0.822	**0.009****	-3.294	-5.590	-0.997	**0.005****
Constant	117.838	114.361	121.316	0.000**	116.088	114.199	117.977	**0.000****
Adjusted R^2	0.104			0.107				

Voc. High School Vocational High School Of Health Services, ICU: Intensive Care Unit

4. Discussion

Exposure to blood and body fluids as well as sharp instrument injuries (including needle-stick injury) are serious hazards faced by health care workers (HCWs) in healthcare institutions. Nurses and midwives, who have direct contact and are in constant communication with patients, are more likely to be exposed to these injuries due to frequent contact with sharp medical instruments (including needles) and in this context they are considered to be in the occupational risk group (12,14,16).

Mean total score of the health care workers who participated in our study in the Healthcare Workers' Attitude Scale Towards Safe Use of Needle-Stick and Sharp Medical Instruments Attitude Scale Towards the Safe Use of Sharp Medical Instruments was found to be 113.89±9.52. In a similar study conducted by Özberk and Kutlu (9) with healthcare workers, mean total score in the Attitude Scale was calculated as 104.95±12.9. In a similar study Özyiğit et al. (13) calculated mean total score of healthcare workers in the scale as 84.21±5.23. Mean total score in the scale was calculated as 70.26±11.65 in the study conducted by Akça and Aydın (11). Considering that the maximum total score that can be obtained from

the scale is 125, mean score calculated in our study, which is very close to the highest score, indicates majority of healthcare workers use sharp medical instruments safely. The fact that nearly half of the healthcare workers in the study group have a bachelor's degree and that majority of them received training on the safe use of sharp medical instruments is thought to have a positive impact on their attitudes.

In our research, it was determined that 44.4% of the healthcare workers were exposed to sharp instrument injuries, 73.6% referred to the relevant departments after the injury, 51.7% did not refer to the relevant department as they did not have enough time, 86.3% received training on sharp instrument injuries and 50.5% of them found the training they received sufficient. In their study examining the knowledge, attitudes and practices of healthcare workers regarding sharp instrument injuries, Alsabaani et al. (15) argued that the incidence of sharp instrument injuries over the last 12 months was 11.57%, these injuries were most frequently encountered among nurses and female healthcare workers and that 52.7% of these injuries were not reported. They further reported that the incidence of sharp instrument injuries was significantly higher in secondary healthcare institutions and surgery clinics. Altıok et al. (8) concluded that 79.1% of healthcare workers were exposed to sharp instrument injuries before, 12.7% of them referred to the relevant department following the injury, the reason of not referring to the relevant department in case of injury was stated by 48.6% that they were not unaware of the procedure/protocol however 12.9% stated that they did not have enough time and 70.1% of them told that they received training on the issue. In a similar study conducted by Yazar et al. (16), it was stated that 59.0% of healthcare workers were exposed to sharp instrument injuries before and 6% of them referred to the relevant department following the injury. Karacaer et al. (17) reported that 53.6% of healthcare workers were injured by sharp instrument injuries before, 68.0% referred to the relevant department following the injury and 78.4% received training on the issue. In a similar meta-analysis study conducted by Gheshlagh et al. (18) in Iran, it was reported that 42.5% of healthcare workers were exposed to injury. In the study conducted by Afridi, Kumar, and Sayani (19) in Pakistan, it was reported that 64% of healthcare workers were exposed to sharp instrument injuries before, 1.4% referred to the relevant department following the injury and 10.1% stated that they did not receive an efficient training regarding sharp instrument injuries. The workload and the high number of patients in the departments/clinic where they were assigned as well as the inadequacy of healthcare workers increase the risk of sharp instrument injuries. Based on this and other study results, it can be concluded that the rate of exposure to sharp instrument injuries are high however the rate of reporting such exposure is low. This result reveals that healthcare workers do not have time to refer to the relevant unit following an injury due to heavy workload and the fact that they do not know the necessary procedure/protocol. Although it was concluded that the rates of training received on sharp instrument injuries are quite high, it is thought that healthcare workers are not sensitive about referring the case to the relevant unit due to the reasons stated above.

The attitudes of female healthcare professionals participating in our study towards the safe use of sharp medical instruments were found to be higher than those of male. It was further determined in this study that the attitudes of male health care officers, who were exposed to sharp instrument injuries before, on the safe use of sharp medical instruments were found to be low while the attitudes of those with a postgraduate degree were higher. In their study examining the effects of some characteristics of nurses on the sharp instrument injuries, Bozdemir and Bahar (21) reported that nurses' characteristics such as age, gender, education, department/clinic they work in and their working experience affect their cognitive, affective and behavioral attitudes. In their study examining the relationship between gender and the knowledge, attitudes and prevalence of healthcare workers regarding sharp instrument injuries, Altaf et al. (23) found that the rate of female employees being exposed to sharp instrument injuries was higher than male employees. In their systematic review examining the healthcare workers' prevalence

of exposure to sharp instrument injuries in developing countries and related factors Mengistu and Tolera (24) found that the prevalence of sharp instrument injuries varied between 19.9% and 54% and the frequency of occurrence throughout the professional career was reported to be 64.1%. In this study, it was determined that the factors affecting sharp instrument injuries were gender, education, occupation, workload, working experience and the use of personal protective equipments (PPEs). Hassanipour et al. (25) examined the risk factors for sharp instrument injuries affecting healthcare workers and reported that these factors include being young, being female, having night shifts, lower working experience, working in surgical clinics and not receiving trainings on these injuries. There are studies in the literature reporting that gender has no effect on attitudes (11, 19) besides other studies in which the prevalence of female healthcare workers being exposed to injuries is found to be higher than that of males (18, 19, 22). Belachew et al. (26) reported that the probability of exposure to sharp instrument injuries was two times higher in male nurses compared to female nurses. Kebede and Gerensea (27) concluded that the risk of being exposed to sharp instrument injuries is approximately five times higher in nurses who do not follow infection prevention rules compared to nurses who follow them. Socio demographic and occupational characteristics found in the literature to affect sharp instrument injuries faced by healthcare workers vary. It is recommended to plan further evidence-based comparative studies involving more study groups on this subject.

5. Conclusion and Recommendations

In this study, it was found that the attitudes of male healthcare workers, those who were having night shift, those who experienced sharp instrument injuries, midwives and health care officers towards safe use of sharp medical instruments were low. In line with the results obtained in the study, it was recommended to provide the necessary occupational health and safety/in-service trainings for healthcare workers on the safe use of sharp medical instruments at regular intervals, to decrease the frequency of night shifts, to operate medical waste management procedures effectively, to comply with all standard protective measures, to report near-miss incidents/occupational accidents, to encourage healthcare workers to participate in the training provided and to conduct more comparative studies on sharp instrument injuries.

Limitations

The study covered the healthcare workers working in a single city hospital between the dates the study was conducted, who met the inclusion and the voluntary participation criteria, therefore the results can be generalized exclusively to the institution where the study was conducted.

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Research Article

Dyspnea, Care Dependency, and Frailty in Older Adults with Chronic Obstructive Pulmonary Disease: A Correlational Study

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Abstract

Objective: As chronic obstructive pulmonary disease (COPD) progresses, older adults have an increased symptom burden, including severe dyspnea. The present study aimed to investigate the relationship between dyspnea, care dependency, and frailty in older adults with COPD.

Methods: The current study was a descriptive-correlational study. One hundred and five participants were included. Data were collected face-to-face using the Dyspnea-12 Scale, Care Dependency Scale, and Edmonton Frailty Scale. Correlation and regression analysis were performed.

Results: The median score for dyspnea was 24 (moderate to high), 61 (low) for care dependency, and 10 (moderate) for frailty. Age (β=0.171, p=.013), COPD stage (β=0.465, p<.001), and income status (β=0.907, p=.049) were the predictors of dyspnea and explained 67.1% of the variance. Age (β=-0.43, p<.001), COPD stage (β = 0.506, p<0.001), and income status (β=- 0.147, p<.001) were also identified as the predictors of care dependency. Besides age and COPD stage, educational status (β=0.172, p<.049) were the predictors of frailty.

Conclusions: This study implied that older adults who had advanced stage COPD, were lower educated, had low-income levels, and comorbidities perceived higher care dependency and frailty. Nurses should assess both dyspnea and care dependency to identify older adults with COPD at risk for increased frailty. Studies considering COPD stage, education level, income status, and comorbidities on dyspnea management, and alleviating care dependency and frailty are warranted.

Keywords: Care Dependency, Chronic Obstructive Pulmonary Disease, Dyspnea, Frailty, Older Adults, Nurse

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1. Introduction

Chronic obstructive pulmonary disease (COPD) is a preventable and treatable chronic disease with a high prevalence, associated with progressive airflow obstruction that interferes with normal breathing and is responsible for serious morbidity and mortality worldwide (1). World Health Organization has announced that more than three million people die from COPD each year worldwide (2). COPD is also the fourth most common cause of death in Türkiye (3).

Recent clinical and cellular evidence has shown that accelerated (lung) aging is a significant predisposing factor for the development of COPD. COPD brings breathing difficulty, cough, mucus (sputum) production and wheezing due to a common inflammatory cascade and causes comorbidities including muscle wasting, osteoporosis, lung cancer, cardiovascular diseases, and metabolic disorders (4). Nutrition problems, anxiety, and depression that trigger frailty are also common in older adults with COPD (5). As COPD progresses, older adults have a higher symptom burden including fatigue, coughing,

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sputum production, weakness in muscles, loss of appetite, anxiety, depression, sleep disturbance, and shortness of breath or severe dyspnea (6).

Considering the relationship between advanced age and COPD, and the trend toward aging in the world (7), it is crucial to address potential factors that may influence increasing symptom burden, care-related problems, and frailty syndrome, and develop comprehensive disease management, self-care or self-efficacy programs to alleviate COPD burden among the older population (8). Both physical symptoms such as dyspnea, fatigue, cough, increased sputum production, anorexia, weight loss, and cognitive and psychosocial symptoms including weakening in cognitive functions, attention changes, anxiety, and depression among adults with COPD restrict individuals' daily living activities, also deteriorates the health, well-being, and quality of life (9, 10). The most prominent symptom in adults with COPD is chronic and progressive dyspnea, which initially appears with heavy effort, but becomes evident over time even with mild or low effort (11,12). The increase in the severity of dyspnea should be considered as an indicator of poor prognosis for COPD (13). Severe dyspnea, especially during exercise and in acute exacerbation reduces the physical activities of adults who can perform independently, causes them to get assistance from family members even in self-care, and thus brings care dependency problems (14).

COPD with progressive decline in pulmonary function and acute exacerbations plays a facilitating role in frailty, which is one of the important geriatric syndromes in older adults, in addition to the severe symptom burden and increasing care needs, as well as care dependency (15, 16). Frailty is defined as the depletion of reserves in many systems in the human body and increased sensitivity to external stresses, including all negative health consequences such as reduced physiological reserves due to age, decreased body mass index, weakness, slowness, lower physical activity, stress intolerance, and burnout (17, 18). The risk of progress frailty has risen in older adults with chronic lung disease, for COPD (frailty 50.3%, prefrailty 35.3%) compared with those without chronic lung problems (19, 20). Multiple factors including lower pulmonary function, severe dyspnea, poorer exercise capacity, diminished quality of life and higher mortality may contribute to the deepening of frailty in adults with chronic lung disease. Roughly, one in five people with COPD is estimated to experience frailty (21, 22). Frailty and COPD are associated with common risk factors including aging, increased chronic inflammation, endocrine dysfunctions, and smoking (1, 10). The onset of COPD symptoms after the age of 40 and the increase in repeated hospitalizations, together with the increase in exacerbations at later ages, may make older individuals more vulnerable. Besides, adults with COPD constitute a risky population for frailty in terms of accompanying common symptoms such as refractory dyspnea, fatigue, anorexia, exercise intolerance, reduced walking distance, muscle weakness, and balance problems (23, 24). Frailty independently predicts many health-related adverse outcomes, including frequent hospitalizations, longer hospital stays, and increased mortality, and is related to higher symptom burdens both physical and psychological (22).

The literature confirms that the severity of dyspnea is an important factor in daily living, functional capacity, quality of life, and disease stage in adults with COPD (25). Limited studies pointed out the importance of care dependency and frailty in the COPD population (15, 16). Although COPD is an important cause of mortality and morbidity, no study has focused on care dependency in older adults with COPD, and few studies have compared care dependency levels in adults with COPD and other chronic conditions (25, 26). Jannsen et al. (2014) compared the changes in care dependency over one-year among adults with advanced COPD, heart failure, and chronic renal failure, and specified that older adults, who experienced frequent hospitalizations, had higher comorbidities, and were diagnosed with advanced COPD had an increased risk of care dependency (25). Unlike this study, Köberich et al. (2014) reported no difference in levels of care dependency among adults with COPD and heart failure (26). However, there have been no studies that address dyspnea, care dependency, and frailty levels in a specific sample that included only older adults with COPD, simultaneously. Moving from this literature gap, this study aimed to determine sociodemographic and clinical characteristics that may have an

impact on dyspnea, care dependency, and frailty, and define the relationship between these three variables in older adults with COPD. Following research questions were developed:
How socio-demographic and clinical features may affect dyspnea, care dependency, and frailty in older adults with COPD?
What is the correlation between dyspnea, care dependency, and frailty in older adults with COPD?

2. Methods

2.1. Study design

This study had a descriptive-correlational design.

2.2. Participants and sampling

The participants were older adults with COPD. A convenience sampling was used to recruit participants. Eligibility criteria were as follows: (1) being literate, (2) being older than 65 years, (3) having stage I-IV COPD according to the GOLD 2020 criteria, (4) not having a cognitive and communication problems, and (5) being volunteered to participate in the study. Participants were excluded if they (1) were admitted to emergency or intensive care units with a COPD exacerbation during the study, and (2) refused to participate.
G Power 3.1.9.4 software program was utilized to determine the sample size (27). Estimating the correlation coefficient value between the Dyspnea-12 Scale and the Care Dependency Scale as 0.50, the sample size was determined to be at least 105 older adults in the study with 0.90 power and 0.05 margin of error (28). A total of 150 older people were evaluated for eligibility criteria during the study,. Among those, illiterate (n=30), under 65 years (n=5), had cognitive problems (n=5), and refused to participate (n =5) were excluded. Finally, 105 older participants with COPD were included (Fig. 1).

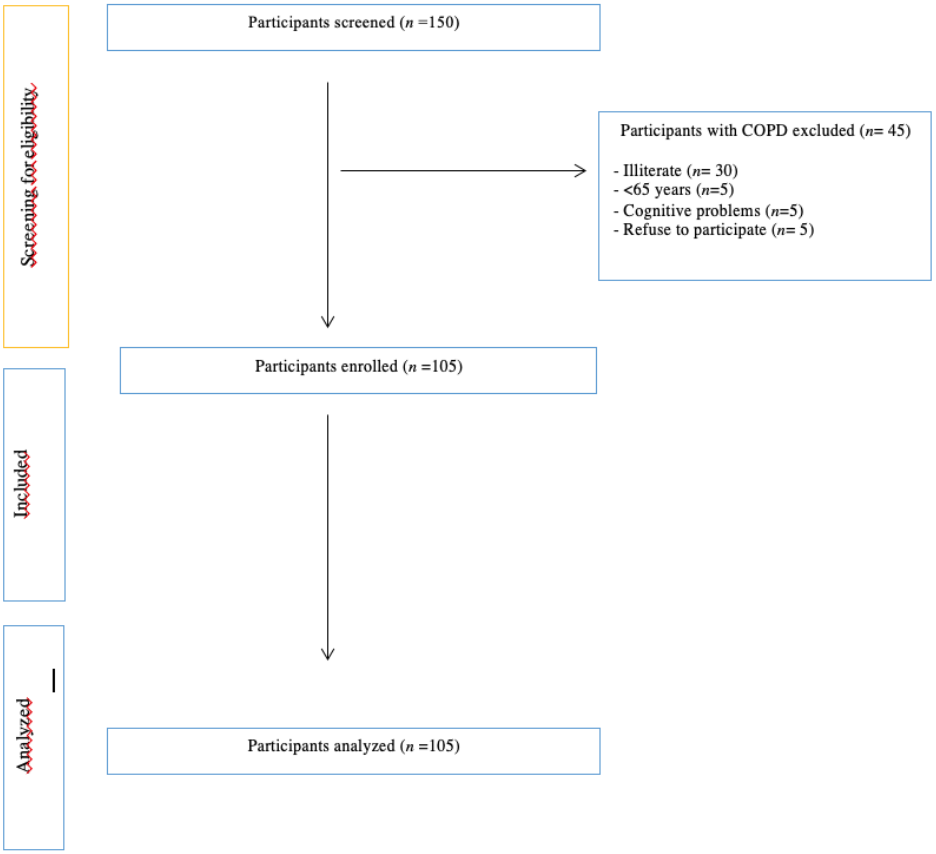

Figure 1. Flow Diagram of the Study Sample

2.3. Data Collection

Data were collected between October 1, 2019, and April 1, 2020, from three different centers: The Chest Diseases Clinic of Gazi University Health Research and Application Center, the Internal Medicine Clinics of Hacettepe University Adult Hospital, and the Chest Diseases Clinics and Outpatient Clinics of Health Sciences University Gulhane Training and Research Hospital. The questionnaires were applied face-to-face. It took approximately 30 min for each participant to complete all the instruments.

2.4. Measurements

2.4.1. Patient information form

This form was developed based on the relevant literature (6, 9, 10), and included nine questions: age, gender, marital status, educational level, employment status, income status, COPD stage, comorbidities, and the number of medications used.

2.4.2. Dyspnea-12 scale

The scale is a 12-item tool developed to evaluate the multidimensional aspects of dyspnea (28). The scale has two sub-dimensions: physical (1-7 items) and emotional (8-12 items). The physical sub-dimension of the scale includes items such as my breathing does not go in all the way, my breathing takes more effort, I fell short of breath, I have difficulty catching my breath, etc. Regarding the emotional sub-dimension, the scale includes the following items: my breathing makes me feel depressed, my breathing makes me feel miserable, my breathing is distressing, my breathing makes me agitated, and my breathing is irritating are placed on the scale. The scale items are scored on a four-point Likert scale described as “0=none”, “1=mild”, “2=moderate”, and “3=severe”. The total score ranges from 0 to 36, with higher scores indicating higher levels of dyspnea. Gok Metin and Helvaci (2018) investigated the Turkish reliability and validity of the scale, reporting the Cronbach's alpha value to be 0.97, and the test-retest reliability to be 0.94 (29). In the present study, Cronbach’s alpha value wascalculated to be 0.97.

2.4.3. Care dependency scale

The scale was developed by Dijkstra et al. (1998) based on Virginia Henderson’s Basic Human Needs (30) and helps to assess the care dependency level regarding eating, mobility, incontinence, body temperature, drinking, dressing, body posture, day/night pattern, undressing, hygiene, communication contact with others, daily activities, recreational activities, avoidance of danger, etc. among people with chronic diseases. Yönt et al. (2010) (31) conducted its’ Turkish reliability and validity, the Cronbach’s alpha value was reported as 0.91. The Turkish version includes 17 items, and two new items are cognitive abilities and worship. Each item is scored on a five-point Likert scale ranging from “1=complete dependency” to “5=complete independence.” The total scores of the scale may vary between 17 and 85. Lower scores indicate that people are completely dependent on care, higher scores mean that people are almost independent of care. The Cronbach’s alpha value was calculated as 0.91 in this study.

2.4.4. Edmonton frailty scale

Rolfson et al. (2006) (32) developed the Edmonton Frailty Scale, and the internal consistency of this scale was reported as 0.62. The Edmonton Frailty Scale measures a total of nine domains of frailty including general health status, nutrition, cognition, mood, functional performance, medication use, social support, functional independence, and continence. Total scores on the scale can range from 0 to 17. The participants are classified into five categories, with higher scores meaning higher frailty. According to the Edmonton Frailty Scale, 0 to 4 points are categorized as “not frail.” Those with 5 to 6 points are categorized as “vulnerable;” those who score 7 to 8 points are categorized as “mild.” At 9 to 10 points, their condition is “moderate,” and at 11 to 17 points, their condition is “severe”. The Turkish

validity and reliability of the scale was performed by Aygör et al. (2018) and Cronbach's alpha value was 0.75 (33). The Cronbach's alpha value was found as 0.75 in the current study.

2.5. Data analysis

SPSS IBM 25.0 software (IBM Corp., Chicago, IL, USA) was used for data analysis. Descriptive statistics were utilized to present the socio-demographics and clinical characteristics of older adults. Chi-square analysis was used to assess the associations between categorical variables. The Shapiro-Wilks test, Kolmogorov-Smirnov test, and the graphical test were used to check compliance with normal distribution. As dyspnea, care dependency, and frailty scores were not normally distributed, the median, first, and third quartiles were presented. Group differences were defined based on Mann-Whitney U (two groups), or Kruskal Wallis (more than two groups). Pairwise comparisons with Bonferroni correction were applied if there was a significant difference between more than two groups. The Spearman correlation test was used to measure the correlation between the Dyspnea-12, Care Dependency Scale, and Edmonton Frailty Scale scores. p values <0.05 were accepted as statistically significant.

The multiple regression model was carried out to examine the effect of socio-demographic and clinical characteristics on dyspnea, care dependency, and frailty. Total Dyspnea-12, Care Dependency Scale, and Edmonton Frailty Scale scores were used as dependent variables in the linear regression model. Age (categorized as 65-70 and >70 years), COPD stage, educational status (university vs high school), income status (middle vs high), comorbidities (hyperlipidemia vs coronary artery disease), and treatment for other comorbidities (present (yes)-not present (no) were modeled as independent variables. In multivariate analysis, variables found to be statistically significant were included in the regression model. Subsequently, separate analyses were carried out for Dyspnea-12, Care Dependency, and Edmonton Frailty Scales.

2.6. Ethical considerations

Hacettepe University Non-Interventional Clinical Research Ethics Committee (Approval Number: GO 19/841, 2019/20-57, Approval date: 03.09.2019) approved the study. The institutional permissions were obtained from all study settings. The study aim was explained to each participant, and verbal and written informed consent was obtained. Participants were clearly informed that they could withdraw from the study at any point in time without stating a reason. They were informed that there was no cost to participate in this study. The study adhered to the tenets of the Declaration of Helsinki. Information including name and participant identification number was not requested to preserve anonymity, and each participant was given a unique code to ensure confidentiality. The authors obtained permission for all utilized scales, which were validated for the Turkish population.

3. Results

The mean age was 73.71(SD=6.17) years, and most of the participants were male (59%), married (79%), retired (65.7%), had primary school graduates (75.2%), and 56.2% of those had moderate income. Considering smoking status, 11.4% of participants were current smokers and the vast majority (61.9%) of them were former smokers. 86.7% of them had comorbidities, and those were frequently listed as hypertension (59%), diabetes mellitus (41%), coronary artery disease (37.1%), asthma (15.2%), and hyperlipidemia (15.2%) (Table 1). The vast majority (45.7%) of the participants were diagnosed with stage II COPD and most of them (94.3%) were receiving COPD treatments. COPD treatments were Beta-2 agonists (51.4%), anticholinergics (41%), combined inhalers (34.3%), corticosteroids (27.6%), and methyl xanthine (12.4%) (Table 1).

Table 1. Participants' Characteristics (n=105)

Characteristic		
Age (year) (Mean, SD)[a-]	73.71, 6.17	
	n	**%**
Age		
65-70	38	36.2
71+	67	63.8
Gender		
Female	43	41.0
Male	62	59.0
Marital status		
Married	83	79.0
Single	22	21.0
Educational status		
Primary school	79	75.2
High school	21	20.0
University	5	4.8
Working status		
Employed	1	1.0
Unemployed	35	33.3
Retired	69	65.7
Income status		
Low	45	42.8
Middle	59	56.2
High	1	1.0
Smoking status		
Current smoker	12	11.4
Former smoker	64	61.0
Never smoked	29	27.6
Pack-years		
1-20	1	8.3
21-40	6	50.0
41-60	5	41.7
Co-morbidities		
Yes	91	86.7
No	14	13.3
HT	62	59.0
CAD	39	37.1
DM	43	41.0
Asthma	16	15.2
HL	16	15.2
Others	45	42.9
GOLD stage		
Stage I	9	8.6
Stage II	48	45.7
Stage III	29	27.6
Stage IV	19	18.1
Use of treatments		
Yes	99	94.3
No	6	5.7

Beta-2 agonists	54	51.4
Anticholinergics	43	41.0
Combine inhaler	36	34.3
Steroids	29	27.6
Methylxanthine	13	12.4

[a]SD, Standard deviation. [b] Valid percentage. [c]n folded.
Abbreviation: DM, Diabetes Mellitus, CAD, Coronary Artery Disease, GOLD, Global Obstructive Lung Disease, HT, Hypertension, HL, Hyperlipidemia, 25.p, 25. Percentage, 75.p 75. Percentage, CI, Confidence interval.

The median scores of the Dyspnea-12 Scale were 24 (moderate to high), 14 for the physical subscale, and 10 for the emotional subscale. A positive, and moderate correlation was found between age and the Dyspnea-12 Scale scores (r=0.561, p<.05; Table 2).

In univariate analyses, according to the characteristics of the participants, a statistically significant difference was found between age, marital status, educational level, employment status, income level, COPD stage, presence of comorbid conditions, and the total number of treatments used for other comorbid conditions in terms of Dyspnea-12 scores (p<.05). By analyzing the tolerance and variance inflation factor (VIF), the multicollinearity of the independent variables was tested. The tolerance was above 0.1 and the VIF was below 10 (1.079-1.197), confirming the absence of multicollinearity. The Durbin-Watson statistic of the multiple regression model was 1.463, confirming the absence of correlations among the residuals. The regression model was statistically significant (F=43.390, p<.001), and age (β=0.171, p=.013), COPD stage (β=0.465, p<.001), and income status (β=.907, p=.049) were identified as the predictors of dyspnea and these variables explained 67.1% of the variance (Table 5).

The median scores of the Care Dependency Scale were found to be 61, at a low level. No significant difference was found between gender, employment status, smoking, cigarette pack/year, and medication use for COPD and the Care Dependency Scale scores (p>.05; Table 3). A strong and negative correlation was also found between age and Care Dependency Scale scores (r=-0.716; p<.05; Table 3). According to univariate analyses, a significant difference was observed between age, marital status, educational level, income status, COPD stage, the total number of drugs used per day, and Care Dependency Scale scores (Table 5, p<.05). The regression model was statistically significant (F=57.824, p<.001), and age (β=-0.43, p<.001), COPD stage (β=0.506, p<.001), and income status (β=- 0.147, p<.001) were identified as the predictors of care dependency and these variables explained 68.6% of the variance. When comparing the age groups 65-70 and over 70, the Care Dependency Scale score of participants over the age of 70 is 12.996 points lower than that of the 65-70 age group (Table 5).

Table 2. Comparison of Dyspnea-12 Scale Scores by Sample Characteristics (n=105)

Characteristic	Physical Sub-scale (25.p-75.p)	Test statistics	p	Emotional sub-scale (25.p-75.p)	Test statistics	p	Dyspnea-12 Scale (25.p-75.p)	Test statistics	p	Difference
Age(year) (Mean, SD)[a]		0.540[b]	***.001***		0.516[b]	***.001***		0.561[b]	***<.001***	
Gender										
Female	14 (12-18)	1077.5[c]	.093	8 (5-11)	1071.5[c]	0.85	21(18-29)	1072.000[c]	.88	-
Male	15 (13-21)			10 (7-15)			26 (19-33)			
Marital status										
Married	14 (12-19)	556.00[c]	***.005***	9 (5-11)	579.0[c]	***.008***	23 (18-30)	552.500[c]	***.004***	2-1
Single	19 (14-21)			11.5 (10-15)			32 (24-36)			
Educational status										
Primary school	15 (13-20)	9.720[d]	***.008***	10 (7-14)	13.029[d]	***.001***	24 (19-33)	13.025[d]	***.001***	1-2,3
High school	13(10-15)			5 (5-10)			18(15-24)			
University	7 (7-14)			5 (3-6)			12(10-19)			
Working status										
Employed	7 (7-7)	892.5[c]	***.029***	1 (1-1)	962.5[c]	.008	8 (8-8)	911.00[c]	***.041***	3-2
Unemployed	14 (12-15)			8 (5-10)			21(17-36)			
Retired	15 (13-21)			10 (6-15)			25 (19-35)			
Income status										
Low	16 (14-21)	873.0[c]	***0.03***	10 (8-15)	868.0[c]	***.002***	26 (23-36)	820.0[c]	***.001***	
Middle	13 (11-18)			7 (5-11)			20 (17-30)			1-2
High[e]	21 (21-21)			12 (12-12)			33 (33-33)			
Smoking status										
Smoked	14 (13-20)	0.128[d]	.938	9 (7-14)	0.074[d]	.963	24 (19-35)	0.148[d]	.929	-
Never smoked	14 (12.5-20)			10 (4.5-13.5)			24(18-32)			
Former smoker	14 (12.5-18.5)			10 (5-12)			24(18-32)			
Pack-years										
1-20[e]	57 (48-68)	12.0[c]	.662	15 (15-15)	11.5[c]	.537	36 (36-36)	12.0[c]	.662	-
21-40	63 (57-74)			6.5 (4-11)			21(16-30)			
41-60	61 (51-79)			10 (10-12)			24 (24-24)			

COPD stage									
Stage I	7 (6-9)	64.889[d]	***<.001***	3 (0-7)	53.443[d]	***<.001***	12 (7-14)	63.016[d]	***<.001***	1-3
Stage II	13 (12-14)			7 (5-10)			20 (17-24)			1-4
Stage III	20 (15-21)			11(10-15)			30 (26-36)			2-3
Stage IV	21(19-21)			15 (15-15)			36 (33-36)			2-4
Comorbidities									
Yes	14 (13-21)	289.5[c]	***<.001***	10 (6-14)	300.5[d]	***.001***	24 (19-34)	276.0[c]	***.001***	1-2
No	12.5 (9-13)			5 (5-8)			18 (14-20)			
COPD treatment									
Yes	14 (13-20)	93.0[d]	.147	10 (5-14)	234.0[d]	.379	24 (18-33)	204.0[c]	.197	-
No	13.5 (9-14)			8 (6-10)			21.5 (15-24)			
Treatment for other comorbidities									
Yes	15 (13-21)	1311.00[c]	.885	10 (6-15)	1260.0[c]	.631	24 (19-34)	1330.5[c]	.987	-
No	12 (9-13)			5(4-8)			18 (14-19)			
Number of drugs used per day									
1-3	14 (12-16)	4.306[d]	.116	8 (5-10)	8.657 [d]	0.13	21(17-29)	6.778 [d]	***.034***	2-1
4-5	16.5 (13.5-21)			11 (9.5-15)			26(23-36)			
6 and over	18 (13-21)			10 (7-12)			29(18-33)			

[a] SD, Standard deviation, [b] Spearman correlation test value, [c] Mann Whitney U test value, [d] Kruskal Wallis test value, [e] Only one participant in the group, [*]*p*<.05, 25.p, 25. Percentage, 75.p 75. Percentage, CI, Confidence interval.

Table 3. Comparison of Care Dependency Scale Scores by Sample Characteristics (n=105)

Characteristic	Median (25.p-75.p)	Test statistic	p	Difference
Age (year) (Mean, SD)[a]	73.71, 6.17	-0.716[b]	***.001***	**-**
Gender				
Female	65 (52-78)	1186.500[c]	.340	-
Male	58 (51-76)			
Marital status				
Married	65 (52-79)	660.500[c]	***<.047***	-
Single	54 (47-62)			
Educational status				
Primary school	57 (46-68)	20.071[d]	***<.001***	1-2
High School	78 (57-83)			
University	81 (79-84)			
Working status				
Employed	81 (81-81)	1198.500[c]	.951	-
Unemployed	61 (53-73)			
Retired	59 (50-79)			
Income status				
Low	57 (44-68)	859.500[c]	***<.002***	1-2
Middle	65 (53-82)			
High[e]	52 (52-52)			
Smoking status				
Never smoked	57 (48-68)	1.598[d]	.450	-
Current Smoker	63 (57-74)			
Former smoker	61 (51-79)			
Pack-years				
1-20[e]	60 (60-60)	11.000[c]	.537	-
21-40	69 (56-80)			
41-60	59 (58-68)			
COPD stage				
Stage I	81 (76-83)	55.928[d]	***<.001***	1-3
Stage II	73 (61-82)			1-4
Stage III	54 (47-87)			2-3
Stage IV	45 (37-52)			2-4
Co-morbidities				
Yes	57 (48-73)	190.500[c]	***<.001***	-
No	82 (76-83)			
COPD treatment				
Yes	60 (50-76)	219.500[c]	.284	-
No	66.50 (57-81)			
Treatment for other co-morbidities				
Yes	57 (48-70)	118.00[c]	***<.001***	-
No	82 (80-83)			
Number of drugs				
1-3	66 (56-76)	11.414[c]	***<.003***	2-1
4-5	54 (43-62)			
6 and over	54 (47-75)			

[a]SD, Standard deviation, [b]Spearman correlation test value, [c] Mann Whitney U test value, [d] Kruskal Wallis test value, [e]Only one participant in the group, 25.p, 25. Percentage, 75.p 75. Percentage, CI, Confidence interval.

Table 4. Comparison of Edmonton Frailty Scale Scores by Sample Characteristics (n=105)

Characteristic	Median (25.p-75.p)	Test Statistic	p	Difference
Age (year) (Mean, SD)[a]		0.659[b]	***<.001***	**-**
Gender[c]				
Female	10 (7-12)	1157.000[c]	.250	-
Male	11(7-13)			
Marital status[c]				
Married	10 (6-12)	571.000[c]	***<.007***	1-2
Single	12 (10-13)			
Educational status				
Primary school	11(8-13)	22.831[d]	***<.001***	1-2,3
High school	6 (4-10)			
University	2 (2-3)			
Working status				
Employed	2(2-2)	1077.500[d]	0.369	-
Unemployed	10(7-12)			
Retired	10(7-13)			
Income status				
Low	11(9-13)	791.500[c]	***<.001***	1-2
Middle	9 (4-12)			
High	12 (12-12)			
Smoking status				
Never Smoked	11(10-13)	2.900[d]	.0235	-
Current smoker	10 (7-12)			
Ex-smoker	10 (6-12)			
Pack-years				
1-20	11(11-11)	12.500[d]	.662	-
21-40	11 (5-13)			
41-60	8 (8-10)			
GOLD stage				
Stage I	4 (3-7)	60.110[d]	***<.001***	1,2-3,4
Stage II	8 (5-10)			
Stage III	12 (11-13)			
Stage IV	13 (11-14)			
Co-morbidities[c]				
Yes	11(8-13)	178.000[c]	***<.001***	1-2
No	4 (4-5)			
COPD treatment[c]				
Yes	10 (7-13)	1203.500[c]	*.264*	-
No	8 (7-10)			
Treatment for other co-morbidities[c]				
Yes	11 (8-13)	189.500[c]	***<.001***	1-2
No	4 (3-6)			
Number of drugs (per day)				
1-3	8 (6-11)	16.989[d]	***<.001***	2-1
4-5	12 (10-14)			
6 and over	11 (9-13)			

[a]SD standard deviation, [b] Spearman correlation test value, [c] Mann Whitney U test value, [d] Kruskal Wallis test value.
GOLD, Global Obstructive Lung Diseases, 25.p, 25. Percentage, 75.p 75. Percentage, CI, Confidence interval.

The median Edmonton Frailty Scale score was 10 (moderate). While 45.7% of the participants were severely frail, and 15.3% were not frail. According to univariate analyses, a statistically significant difference was found between age, marital status, educational status, income status, COPD stage, presence of comorbidities, treatment for other comorbid conditions, total number of medications taken per day, and the Edmonton Frailty Scale scores (Table 4; p<.05). The regression model was statistically

significant (F = 37.157, p<.001), and age (β = 0.229, p<.002), COPD stage (β = 0.462, p<.001), educational status (β =0.172, p<.011), comorbid conditions (β =0.172, p<.011), and treatment for other comorbid conditions (β =0.126, p<.049) were identified as the predictors of frailty and these variables explained 67.6% of the variance. Considering the standardized beta coefficients, the most significant independent variable on the Edmonton Frailty Scale total score is stage IV COPD, and the least significant one is treatments used for comorbid conditions (Table 5).

Table 5. Multiple Regression Model for Predictors of Dyspnea, Dare Dependency, and Frailty (n=105)

Independent variables	**Dyspnea-12 Total Scores**					
	Beta	**SE**	**Std. Beta**	**Lower 95% CI**	**Upper 95% CI**	**p**
Age	0.231	0.092	0.171	0.049	0.413	**0.013**
COPD stage						
Stage II (ref. Stage I)	7.712	1.906	0.465	3.929	11.495	***<.001***
Stage III (ref. Stage I)	15.621	2.111	0.848	11.430	19.811	***<.001***
Stage IV (ref. Stage I)	19.399	2.229	0.907	0.049	0.413	***<.001***
Income status						
Middle-high (ref. low)	1.989	1.000	0.119	0.005	3.972	***.049***
Adjusted R^2 = 0.671 F= 43.390, ***p<.001***						
Independent variables	**CDS Total Scores**					
	Beta	**SE**	**Std. Beta**	**Lower 95% CI**	**Upper 95% CI**	**p**
Age						
>70 (ref. 65-70)	12.996	1.989	-0.403	-16.941	-9.051	***<.001***
COPD stage						
Stage III (ref. Stage I)	-12.094	2.187	-0.349	-16.432	-7.756	***<.001***
Stage IV (ref. Stage I)	-20.393	2.454	-0.506	-25.261	-15.525	***<.001***
Income status						
Middle-high (ref. low)	-6.511	2.729	-0.147	-11.926	-1.097	***<.019***
Adjusted R^2 = 0.686 F= 57.824, ***p<.001***						
Independent variables	**EFS Total Scores**					
	Beta	**SE**	**Std. Beta**	**Lower 95% CI**	**Upper 95% CI**	**p**
Age						
>70 (ref. 65-70)	1.768	0.546	0.229	0.684	2.851	***.002***
COPD stage						
Stage III (ref. Stage I)	3.682	0.531	0.444	2.627	4.736	***<.001***
Stage IV (ref. Stage I)	4.454	0.598	0.462	3.267	5.641	***<.001***
Educational status						
Primary school (ref. university and high school)	1.479	0.572	0.172	0.343	2.615	***<.011***
Comorbidities						
Co-morbid conditions (ref. no comorbid condition) HL	1.526	0.572	0.172	0.343	2.615	***<.011***
Treatment for other comorbidities						
Using treatments for other co-morbid conditions (ref. any)	1.339	0.673	0.126	0.003	2.675	***.049***
Adjusted R^2 = 0.676 F= 37.157, ***p<.001***						

GOLD, Global Obstructive Lung Disease, SE, Standard Error. Generalized stepwise regression model, not normal distribution with identity link. ref, referent CAD, Coronary Artery Disease, HL, Hyperlipidemia, CI, Confidence interval.

A negative and strong correlation was found between dyspnea and care dependency (r=-0.754, p<0.05). A positive and strong correlation was determined between dyspnea and frailty (r=0.765, p<0.05). Care

dependency and frailty scores have showed a negative, and very strong correlation (r=-0.838, p<0.05, Fig. 2).

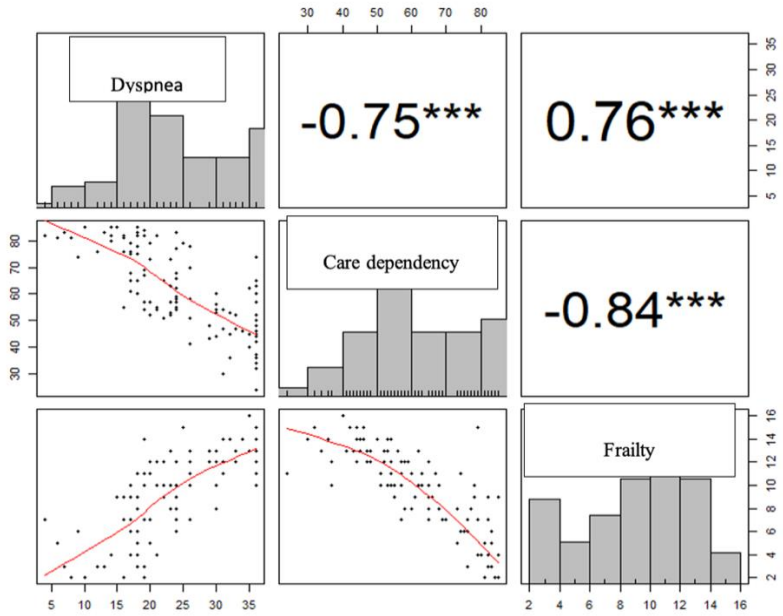

Figure 2. The Correlation Between Dyspnea, Care Dependency, and Frailty Scores

4. Discussion

This study identified factors affecting sociodemographic and clinical variables dyspnea, care dependency, and frailty in older adults with COPD. As a result, the dyspnea, and care dependency were seen as influenced by age, COPD stage, and income status, while care dependency was affected by age, COPD stage, educational status, comorbid conditions, and used treatments for comorbid conditions.
Chronic and progressive dyspnea experienced by individuals with COPD reduces the number of activities performed independently and leads to care dependency (34, 35). Therefore, it is important to evaluate the impact of dyspnea on the lives of people with COPD in a multidimensional approach. In our study, the Dyspena-12 scale scores were found as 24 (moderate-high). Like our findings, the mean scores of the Dyspena-12 scale were reported to be 18, and 26 in two recent studies conducted on the COPD population (35, 36). It is reported that variables such as age, gender, health status, comorbidities, decreased FEV1 value, COPD stage, and smoking status may affect the perceived severity of dyspnea in COPD (12). Confirming previous reports, our findings in the multivariate analyses showed a significant difference between variables including age, advanced stage of COPD, presence of comorbidities, lower income, and the severity of dyspnea. In this study, age, COPD stage, and income status explained 67.1% of the change in the Dyspena-12 scale total score. Our findings stated that an increase of >15 points in the Dyspena-12 scale total score of participants with stage III-IV COPD in the multivariable analyses, which is the estimated significant clinically important difference.

In parallel with our findings, Sharma et al. (2019) (12) reported a significant, and positive correlation between age, the severity of dyspnea, and health status, and emphasized that the severity of dyspnea and the health status worsened in older adults with COPD. The authors assumed that this finding may be associated with the fact that older adults with COPD those who have higher dyspnea severity, either do not work or have low income due to retirement, and they cannot benefit from healthcare opportunities effectively, and generally cannot fully control their disease symptoms, and meet their self-care needs. Discovering additional factors related to dyspnea severity and designing new clinical interventions for better symptom management in older adults may be helpful.

As mentioned earlier, people with COPD experience limitations while performing their daily living activities, have difficulty, and are highly dependent on other people, and their dependency levels vary

with the interaction of multiple factors (37, 38). Age, COPD stage, educational status, income level, presence of comorbid conditions, and the number of treatments used are reported as affecting factors for care dependency (26, 37, 38). Türk and Üstün (2018) (38), and Janssen et al. (2014) (25) identified that care dependency is associated with the increasing age of people with COPD. In our study, the level of care dependency increased as the age increased. Especially, advanced statistical analysis showed that care dependency increased among people older than 70 years compared with adults aged 65-70 years in this study. Considering these findings, it can be inferred that advanced age may be the main predictor for an increase in care dependency in older adults with COPD.

Previous reports have also highlighted a significant association between lower educational status, lower income level, and higher care dependency level (37-39). In line with the literature, care dependency was significantly higher in older adults with stage III and IV COPD (decrease of <12 points), who received treatment for comorbidities (decrease of < 6 points) in our study (26, 37, 38). The authors assume that as the majority of older adults with COPD had primary school graduates and had a low-income level in this study, an individual's knowledge about COPD and its management, used treatments, exacerbations, and symptom reduction may not be sufficient, all of these may lead to a decrease in treatment adherence, and inadequate financial status may negatively affect the situation regarding daily life and self-care and leading to an increase in care dependency.

Our analyses indicated that older adults with COPD had low care dependency scores, however, those with advanced-stage COPD, other comorbidities in addition to COPD, and were using a higher number of treatments had significantly higher care dependency scores. Furthermore, age, stage III-IV COPD, and treatments used for comorbid conditions seem to be significant predictors in care dependency among older adults considering correlational and regression model analysis, and these variables explained a total variance of 68.6% of care dependency scores. Previous studies published similar results that care dependency increased with the progression of the COPD stage (37, 39). Kara (2019) also reported that individuals who continuously received treatments for chronic diseases were more dependent than those who did not receive treatments (37). Khdour et al. (2009) emphasized that medication management problems negatively affected daily life, functional status, and quality of life in people with COPD (40). The lower level of care dependency in our study may be related to the fact that the participants (45.7%) were diagnosed with stage II COPD. However, our results also indicated that care dependency may increase due to conditions such as comorbidities and polypharmacy with the aging process and that higher symptom burden is associated with worse general and disease-specific health status in COPD. Furthermore, inadequate knowledge about the use and management of COPD treatments due to the low education level, increase in drug-drug interactions with aging, changes in cognitive level, cognitive problems, living alone, nutritional deficiencies, increased vulnerability, and lack of self-care may also increase the level of care dependency and emphasizes the importance of addressing symptom burden in the older population with COPD again.

With the aging of the world's population, an important problem that we encounter is the frailty syndrome. Chronic diseases are among the important risk factors for frailty (16, 17). Due to its increasing prevalence in older individuals, COPD is likewise an important risk factor for frailty (17). Uchmanowicz et al. (2016) (41) found that 75% of the participants with COPD were frail. Galizia et al. (2011) (42) investigating the effect of frailty on mortality in people with and without COPD with a 12-year follow-up reported that frailty increased the mortality rate from 41.5% to 75.1% in people without COPD and from 54.3% to 97% in people with COPD. Bernabeu-Mora et al. (2017) (22) reported that 18.4% of adults with COPD were severely frail and 44.7% were vulnerable to repeated hospitalizations within 90 days after hospitalization following acute exacerbations of COPD. It is striking that 45.7% of older participants with COPD in our study were also severely frail and our results revealed a higher level of frailty than the previous studies. Age, advanced stage of COPD, lower educational status,

comorbidities, and medication use were the main predictors of care dependency in older adults with COPD, and these variables explained 0.67% of the change in care dependency scores of our sample. The differences in these findings may result from advanced-stage of COPD, nutritional problems, the severity of dyspnea, comorbidities, polypharmacy, limitations in physical activity, and all the physiological changes that may occur in old age.

In the literature, it is stated that the triggers for frailty are aging, smoking, being single, lack of physical activity, female gender, sarcopenia, multiple medication use, chronic progressive dyspnea, lack of activity, malnutrition, anemia, cachexia, decrease in muscle strength and mass (43, 44). Ierodiakonou et al. (2019) (23) indicated that the prevalence of frailty in adults with COPD was significantly associated with age, COPD stage, ineffective control of the disease, high symptom burden, number of exacerbations, smoking status, and accompanying comorbidities. Confirming the outcomes in the literature, our study demonstrated that advanced-stage COPD, being single, lower-income level, lower educational status, presence of comorbidities, and multiple medication use affected the severity of frailty in older adults with COPD. Besides, stage IV COPD was determined as the most significant variable in the severe frailty in our study. Additionally, the advanced analysis showed that those people over 70 years, had a lower educational level, and were diagnosed with HL had higher frailty in the present study. In addition, frailty may also increase due to reasons including weakening of functional capacity, shortening of walking distance, decrease in muscle strength, decrease in quality of life, repeated hospitalizations, and increased frequency of exacerbations in older adults with COPD. Therefore, disease management and self-care programs aimed at minimizing the care dependency in older adults with COPD are needed in clinical practice.

5. Conclusions and Recommendations

The relationship between dyspnea, care dependency, and frailty in older adults with COPD was assessed in the current study, and dyspnea, care dependency, and frailty were significantly correlated, and three of those increased, as the age increased. It is important to note that, evaluating the triad of dyspnea, care dependency, and frailty simultaneously, and using a holistic care approach while providing care to older adults with COPD. Further studies that consider advanced age, advanced stage of COPD, education level, income status, and comorbid conditions on dyspnea management, and alleviating care dependency and frailty are needed with a larger sample size for older adults with COPD.

Limitations

Our study has several limitations that need to be considered. The multiple linear regression models established for dyspnea, care dependency, and frailty variables explained more than 65% of the variation in scale scores. However, other variables that may influence these variables need to be studied in older adults with COPD. Our findings were based on a cross-sectional analysis rather than on longitudinal assessment of these variables. Thus, our findings are limited in terms of generalizability to a larger population. A longitudinal follow-up study is needed to further elucidate how dyspnea, care dependency, and frailty interact with each other over time in older adults with COPD.

Despite the limitations, the findings make an important contribution to the literature by reflecting the perceived severity of dyspnea, care dependency, and frailty among older adults with COPD, and multiple predictive factors for these three variables.

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Research Article

Lifelong Learning and Sexual Health Literacy in Nursing Students: Cross-Sectional Study

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Abstract

Objective: Lifelong learning and sexual health literacy are two separate concepts that are important in improving health today. The aim of this study is to determine the relationship between sexual health literacy and lifelong learning in nursing students.

Methods: 269 individuals were involved in this cross-sectional investigation. An online poll was used to gather data between August 10 and September 10, 2023. The "Life-long Learning Scale" and the "Sexual Health Literacy Scale" were employed in the research. The data analysis techniques included post-hoc testing, ANOVA, T-tests, and basic linear regression studies.

Results: The mean age of the participants was 21.62±2.41. Of the students, 77.3% were female, 97.8% were single, and 36.1% were in third grade. A moderate, positive, and substantial connection was found between the variables based on a simple linear regression analysis conducted between the scales ($R=0.470$, $R^2=0.221$, $F=75.776$, $p=0.000$). Life-long learning tendency explained 22% of sexual health literacy.

Conclusions: Lifelong learning has a significant impact on sexual health literacy. It is recommended that the necessary programs be prepared, implemented and closely monitored to increase the tendency for lifelong learning in educational institutions.

Keywords: Life-Long Learning, Nursing Student, Sexual Health

1. Introduction

Globalization causes various changes and developments in science, technology, and health services (1). With rapid and continuous technological changes, it is necessary to keep up to date with the latest developments to find creative solutions to problems, increase employability, and gain a sustainable competitive advantage. At this point, educational institutions aim to prepare their students as independent, self-directed, and self-confident lifelong learners with creative and entrepreneurial skills (2). The process of acquiring knowledge and skills that allows people to continue their education after completing formal education is known as lifelong learning. Being a lifelong learner requires deciding what and to what extent one needs to learn, being willing and curious about learning, using information and communication technologies, taking responsibility for one's learning, and having the ability to learn on one's own (1). The creativity process requires specific skills to understand the need for knowledge about a problem and how to find, access, evaluate, use, and manage this knowledge ethically and legally. The combined efforts for creativity can also be defined as lifelong learning (2). Lifelong learning is defined in clinical settings as a collection of self-initiated activities and knowledge-seeking skills in people who have a persistent drive to learn and the capacity to identify their own learning needs (3).

Health literacy is a determinant of health behaviors and refers to the acquisition of knowledge, personal skills, and confidence to improve individual and community health. Sexual health literacy is an extension

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of health literacy and refers to the ability to understand and act based on information about sexual health. Sexual health literacy is considered a very important issue for all people in society. A high level of sexual health literacy increases a person's skills in analysis, judgment, discourse, decision-making, and sexual behavior changes and strengthens their ability to improve and maintain their sexual health. Although people's concerns about sexual practices and relationships are not new, changes in health information in this area have changed the nature of these concerns (4).

Sexual and reproductive health education is protective for adolescent pregnancy, negative sexual and reproductive health outcomes, and negative social outcomes. However, knowledge about this is often inadequate. Social skills and competencies are also important to promote and maintain a healthy life (5). Having sexual health literacy leads to an improved ability to understand and assess risks associated with sexual health, delaying the first sexual experience, engaging in a safe sexual experience, properly fulfilling the gender role, improving sexual interactions of couples, improving individual sexual health, and eventually improving family and social health (6).

Life-long learning is an important part of professionalism for nurses to maintain their practice competence and up-to-date knowledge (7). The literature contains a variety of studies on nursing students' inclinations toward lifelong learning (1,7,8). However, there is no study in which the effect of lifelong learning on sexual health literacy in nursing students has been examined. Nursing students with high levels of lifelong learning tendency and sexual health literacy will be effective in meeting society's educational needs in the future. However, co-promoting the sexual health literacy and lifelong learning tendencies of nursing students will ensure the improvement and development of health services to be provided to individuals and society. Considering the importance of sexual health literacy in promoting individual sexual health and improving family and social health and that lifelong learning requires using information and communication technologies and following current scientific knowledge, this study aimed to determine the relationship between lifelong learning and sexual health literacy in nursing students.

1.1. Hypothesis of the research

Lifelong learning positively and significantly affects sexual health literacy.

2. Methods

2.1. Study design

There is a cross-sectional design to the investigation. An online poll was used to gather the data (Google Forms) between August 10 and September 10, 2023.

2.2. Participants

Nursing students enrolled in the "Faculty of Health Sciences" at a state university in Hatay, Turkey participated in this study. A total of 405 students who were enrolled in the nursing department during the spring semester of the 2023 academic year made up the study's population. It was calculated that the sample should be at least 198 people within the 95% confidence interval in the population of 405 people. Of the 269 students who fulfilled the inclusion criteria, 269 made up the study sample. These were the eligibility criteria: being aged 18 or over, being an undergraduate nursing student, completing the surveys completely, and volunteering to participate in the study. Data collection was conducted using online surveys (Google Forms).

2.3. Data collection tools

Three distinct forms were used to collect the study's data: "Personal Information Form", "Life-long Learning (LLS) Scale", and "Sexual Health Literacy (SHLS) Scale".

2.3.1. Personal information form: This form consisted of 5 questions that were prepared to determine some descriptive characteristics of the participants. It included questions regarding sex, age, grade, socio-economic level, and place of longest residence.

2.3.2. Life-long learning (LLS) scale: The original life-long learning scale was developed by Wielkiewicz and Meuwissen (2014) and its Turkish validity and reliability study was conducted by Engin et al. (2016). The original LLS scale developed by Wielkiewicz and Meuwissen (2014) has 16 items, but in the Turkish adaptation study, the first item of the scale was removed from the scale since it was non-factorial and a scale with a total of 15 items was obtained. The scale items were grouped under a single factor. The scale aims to assess the life-long learning tendencies of students and other groups. A 5-point Likert-type rating system is used: (1) never, (2) rarely, (3) occasionally, (4) often, and (5) always respectively. The Cronbach alpha reliability coefficient for the overall scale was reported as 0.93 (9).

2.3.3. Sexual health literacy (SHLS) scale: Ustgorul (2022) developed the "Sexual Health Literacy Scale" to determine the literacy levels of individuals about sexual health and established its validity and reliability. The scale was determined to be a tool with acceptable values in different professional groups to measure the sexual health literacy of individuals. The Sexual Health Literacy (SHLS) Scale consists of 17 items and 2 factors (sexual knowledge and sexual attitude) and has a 5-point Likert-type rating scale ranging from Strongly Disagree (1) to Strongly Agree (5). The sexual knowledge subscale has 12 items, and the sexual attitude subscale consists of 5 items and is reverse-coded. An increase in the scores on the total SHL scale and its subscales indicates a high level of sexual health literacy. The scale's reported Cronbach alpha coefficient was 0.88 (10).

2.4. Data analysis

Analyses were performed in SPSS (IBM SPSS for Windows, ver.26) statistical package program. Frequency and mean were used to describe the characteristics of the participants. The normality assumptions of the numerical variables were evaluated with Kolmogorov Smirnov and Shapiro-Wilk normality tests. A skewness and kurtosis coefficient of a data set between -1.5 and +1.5 indicates that the data are normally distributed (11). Accordingly, since the data were normally distributed, the t-test was used for the analysis of two variables, and the ANOVA test was used for the analysis of more than two variables. Post-hoc tests were used to determine the difference between three or more groups. The association between the variables was investigated using a simple linear regression analysis. A 95% confidence interval and a significance level of $p<0.05$ were used to assess the results.

2.5. Ethical consideration

Ethics committee approval was taken from Hatay Mustafa Kemal University Noninvasive Clinical Research Ethics Committee (Dated 01/08/2023 Numbered 6 Page: 1-2 Decision Number: 4). The objective of the study and the participants' voluntary participation were explained to them at the outset of the investigation. Their consent was taken after the explanation text about the research. The research complied with the principles of the Declaration of Helsinki.

3. Results

3.1. Descriptive characteristics of the participants and results of the distribution of LLS scores

Table 1. Descriptive Characteristics of the Participants and Distribution of Their Scores on the LLS Scale

Variables (n=269)	***n***	***%***	***LLS scores***	***t/F/p values***
Gender				
Female	208	77.3	54.37±8.49	t=0.532
Male	61	22.7	53.72±7.91	p=0.595
Marital status				
Married	6	2.2	62.33±5.59	t=2.425
Single	263	97.8	54.03±8.32	**p=0.016**
Grade				
1st	46	17.1	50.86±5.47	2>1,2>3
2nd	57	21.2	55.70±9.17	4>1,4>2,4>3
3rd	97	36.1	51.65±8.42	F=15.206
4th	69	25.7	58.84±6.75	**p<0.001**
Socioeconomic Status				
Low (1)	53	19.7	50.83±7.62	2>1,3>1
Moderate (2)	203	75.5	54.99±8.41	F=5.719
High (3)	13	4.8	56.00±7.30	**p=0.004**
Longest residence				
Village/town	68	25.3	54.60±9.10	
District	105	39.0	55.01±7.67	F=1.443
City	96	35.7	53.08±8.49	p=0.238
Age (mean:21.62±2.41)				
18-21	130	48.3	52.20±7.20	2>1
22-25	134	49.8	56.10±9.05	F=7.676
26 ≤	5	1.9	56.20±4.91	**p=0.001**

LLS= Life-long Learning Scale, T test, One way anova, LSD or Tamhane T2

When some descriptive characteristics of the nursing students included in the study were examined, the mean age was 21.62±2.41 years. Of the students, 77.3% were female; 97.8% were single; 36.1% were in the third grade; 75.5% had moderate socioeconomic status; and 39.0% lived in the district for the longest time (Table 1). When the LLS scores of the participants were examined according to their descriptive characteristics, the score of female students (54.37±8.49) was higher than that of male students (53.72±7.91), but the difference was insignificant (p=0.595). When the scores were compared according to marital status, the score of married students (62.33±5.59) was higher than that of single students (54.03±8.32) and the difference was significant (p=0.016). When the scores were analyzed according to grade level, the scores of students in the 4th grade were significantly higher than the scores of students in lower grades (p< 0.001). When the scores were compared according to socioeconomic status, the score of students with moderate and high socioeconomic status (54.99±8.41, 56.00±7.30) was significantly higher than that of students with low socioeconomic status (50.83±7.62) (p=0.004). The longest-residence location and scale scores did not significantly correlate (p=0.238). Finally, it was discovered that students between the ages of 22 and 25 had considerably higher scores than students between the ages of 18 and 21 (p=0.001) (Table 1).

3.2. Results of the distribution of participants' SHLS and SHLS subscale scores

Table 2. Distribution of the SHLS Scores of the Participants According to Their Descriptive Characteristics

Variables (n=269)	***SK scores***	***t/F/p values***	***SA scores***	***t/F/p values***	***SHLS scores***	***t/F/p values***
Gender						
Female	37.92±6.18	t=0.259	16.43±3.24	t=0.949	54.35±5.89	t=0.149
Male	38.21±8.06	p=0.796	15.96±3.75	p=0.343	54.18±8.65	p=0.882
Marital status						
Married	43.00±5.05	t=1.877	16.83±1.94	t=0.372	59.83±4.11	t=2.082
Single	37.87±6.64	p=0.062	16.53±3.30	p=0.710	54.19±6.60	**p=0.038**
Grade						
1st	34.63±9.12		13.86±3.02	2>1,3>1	48.50±6.65	2>1,3>1
2nd	40.28±6.03	2>1,4>1	16.08±3.14	4>1	56.36±7.07	4>1
3rd	37.74±5.99	F=6.898	16.92±3.55	F=12.773	54.67±5.66	F=18.260
4th	38.68±5.06	**p<0.001**	17.31±2.65	**p<0.001**	56.00±5.17	**p<0.001**
Socioeconomic Status						
Low (1)	35.47±7.41	2>1	15.13±2.71	3>2,3>1	50.60±7.62	3>2,3>1
Moderate (2)	38.55±6.42	F=4.973	16.46±3.46	F=8.008	55.02±6.10	F=13.081
High (3)	39.38±4.13	p=0.008	19.00±2.12	**p<0.001**	58.38±3.04	**p<0.001**
Longest residence						
Village/town (1)	38.19±7.29		15.35±2.75	2>1,2>3	53.54±7.40	
District (2)	36.93±6.30	F=2.495	17.71±2.60	F=16.325	54.64±6.79	F=0.632
City (3)	39.00±6.42	p=0.084	15.50±3.96	**p<0.001**	54.50±5.76	p=0.532
Age						
18-21(1)	36.72±7.20		15.46±3.20	2>1	52.18±7.32	2>1
22-25(2)	39.24±5.90	F=4.933	17.10±3.38	F=8.987	56.35±5.16	F=14.490
26 ≤ (3)	37.20±4.43	p=0.008	18.00±00	**p<0.001**	55.20±4.43	**p<0.001**

SK= Sexual Knowledge Subscale, SA= Sexual Attitude Subscale, SHLS= Sexual Health Literacy Scale
T test, One way anova, LSD or Tamhane T2

Table 2 shows information on total SHLS scores and SK (Sexual Knowledge) and SA (Sexual Attitude) subscale scores of the participants according to their descriptive characteristics. The results on the SHLS scale and its subscales were not substantially impacted by gender (p>0.05). SHLS scores of married students were found to be significantly higher than single students (p<0.05). In terms of grade, the 'SK (sexual knowledge)' subscale score of 2nd-grade and 4th-grade students was significantly higher than that of 1st-grade students (p< 0.001). The 'SA (sexual attitude)' subscale scores of the students in the 2nd, 3rd, and 4th grades respectively were significantly higher than that of the students in the 1st grade (p< 0.001). The total SHLS scale scores of the 2nd-, 3rd-, and 4th-grade students respectively were significantly higher than that of the 1st-grade students (p< 0.001). When the SHLS scale scores were examined according to socioeconomic status, the 'SA' subscale score and the total SHLS scale score of students with high socioeconomic status were significantly higher than those of students with low and moderate socioeconomic status (p<0.05). In addition, students who identified their place of longest residence as a district had a significantly higher score on the 'SA' subscale than students who identified their place of longest residence as a village/town and city (p<0.05) (Table 2).

3.3. The results of regression analysis for LLS tendency and SHLS attitude

Table 3. The Results of Regression Analysis for LLS Tendency and SHLS Attitude

Variables (n=269)	***B***	***Std.Error***	***β***	***t***	***p***
(Constant)	34.168	2.342		14.590	0.000
LLS	0.372	0.043	0.470	8.704	0.000
R=0.470	**R²**=0.221	**F**=75.766	**p**=0.000	**Durbin-Watson**=1.873	
SHLS total score= 54.31±6.60, LLS total score= 54.22±8.35					
DependentVariable: ***SHLS****, Simple Linear Regression Analysis*					

Based on the findings of the basic linear regression study carried out to ascertain how lifelong learning tendencies affect the attitude towards sexual health literacy, there was a moderate, positive, and significant correlation between the variables (R=0.470; R^2=0.221; F=75.766; p<0.001). Life-long learning tendency explained 22% of sexual health literacy (Table 3).

4. Discussion

It has been emphasized that clinicians need to be lifelong learners to provide effective care, as medical knowledge, skills, and social needs in patient care are rapidly developing (12). In this respect, it is necessary to develop lifelong learning habits in students to keep them pace with technological developments and transformation (2). In this study, the lifelong learning tendencies and sexual health literacy levels of nursing students were determined and the relationship between these two important variables was revealed. The students' LLS scale score was 54.22±8.35, which can be considered a moderate level compared to the total scale score (min:15, max:75). Unlike this study, Senyuva and Kaya (2022) found that nursing students had high levels of life-long learning tendencies (1). According to Dikmen et al. (2016), nursing students had low levels of life-long learning tendencies (13). In the study conducted by Naveed et al. (2023) with medical students, it was found that students had a good level of life-long learning tendencies (2). It is essential to encourage life-long learning tendencies of nurses, who have an important role among health professionals, starting from their student life. Because lifelong learning in nursing is necessary to keep knowledge and skills up to date throughout your career.

This investigation revealed that fourth graders' LLS scores were substantially higher than those of students in lower grades. Likewise, in the study conducted by Karakus (2013) with university students, it was concluded that the life-long learning competencies of the students increased as their grades increased (14). This information suggests that university education may positively influence life-long learning tendency. However, in another study, the grade of nursing students did not significantly affect their life-long learning tendencies (15). Due to constant advances in technology and healthcare practices, it is important that the curriculum is updated to include lifelong learning. To develop lifelong learning competencies in universities, it is necessary to enable students to manage their educational processes, include active learning methods in education, enable students to be involved in problems, and encourage students' self-evaluation (16).

In this study, the LLS scores of students with a moderate and high socioeconomic level were found to be significantly higher than those of students with a low socioeconomic level. Unlike this study, Dindar and Bayraktar (2015) reported that socioeconomic level did not affect life-long learning tendencies (17). In another investigation, it was found that life-long learning tendency was not influenced by students' characteristics such as age and income status (13).

In this study, the sexual health literacy (SHLS) scores of nursing students were found to be 54.31±6.60. When this result was evaluated according to the total scale score considering that the students were studying in the health department, it was determined that they had deficiencies in SHLS. In a similar study, it was found that the rate of seeking information about sexually transmitted diseases (STDs)

among university students was low (18). One study found that most school adolescents aged 15-19 had insufficient sexual and reproductive health literacy (5). There is also a study stating that sexual and reproductive health literacy among young people is alarming and has not been fully researched (19). In another study conducted with Iranian women, it was determined that sexual health literacy was at the desired level (20).

In this study, the SHLS scores of married students were found to be significantly higher than single students. This result suggested that married people have a higher level of sexual health literacy to access correct reproductive knowledge and behaviors.

According to this study's findings, the SHLS score and the sexual attitude subscale score were significantly higher in students in the 4th grade than in students in lower grades. It was thought that the awareness acquired in university education and the courses on sexual health were effective in this. Moreover, in this investigation, it was found that the sexual attitude subscale score and the total SHLS score of students with high socioeconomic status were significantly higher. Higher economic status may have caused an increase in the SHLS score since it facilitates access to the internet, information, and technology. Again, in this study, students who stated the place they lived longest as a district received higher scores from the 'sexual attitude' scale sub-dimension than students who stated as village/town or city. This may be due to personal or social characteristics. Various factors can affect sexual health literacy. Nevertheless, in an Australian university research, it was reported that the level of sexual health literacy was influenced by factors such as sex, age, sexual education, sexual experience, place of birth, and religious commitment (21).

Sexual and reproductive health problems such as adolescent pregnancy, unsafe abortions, sexual dysfunction, sexual violence, and sexually transmitted infections are quite high in the world and Turkey. Individuals need to benefit from resources based on scientific data on reproductive and sexual health (10). Lifelong learning refers to the continuous voluntary and self-initiated pursuit of acquiring knowledge and skills (2).

In this study, a moderate, positive, and significant correlation was determined between lifelong learning tendency and attitude toward sexual health literacy. The study's conclusions state that, lifelong learning tendency explained 22% of sexual health literacy. Lifelong learning tendency caused an increase in sexual health literacy. When the literature was examined, no study was found examining the relationship between lifelong learning and sexual health literacy. However, this result confirmed our hypothesis that, lifelong learning positively and significantly affects sexual health literacy. Sexual health literacy, which plays an important role in eliminating problems related to sexual health and reproduction, is expected to be high in nursing students. In this context, the lifelong learning tendencies of students should be supported, and their sexual health literacy levels should be increased. Students with high lifelong learning tendencies and sexual health literacy will have a good knowledge of current information and developments and be effective in improving public health in their professional lives. Students' adaptation to contemporary developments shows that the future workforce is ready to solve real-life problems (2). Today, information is accessed through the Internet. According to Shimie et al., students' information-seeking behaviors regarding STDs can be improved by increasing their digital literacy and providing computer and internet access across the campus (18).

5. Conclusion and Recommendations

Findings from this study indicated that attitudes toward sexual health literacy and life-long learning tendencies were moderately, positively, and significantly correlated. Lifelong learning has a significant impact on sexual health literacy. Life-long learning tendency explains 22% of sexual health literacy. Since nursing students will play a key role in the protection and development of community and family health in the future, and they need to be constantly knowledgeable about developing and changing health practices, it is necessary to increase their lifelong learning tendencies levels. Currently, it is advised that the necessary up-to-date programs be prepared and implemented in educational institutions and be followed up. Additionally, it is recommended to carry out experiential intervention studies to increase lifelong learning and sexual health literacy in nursing students.

Limitations

The study used a sample of nursing students and a cross-sectional research design, which limits the generalizability of the research. It may be recommended to repeat the research with larger and different sample groups.

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Research Article

The Relationship Between Health Literacy, Quality of Life, and Physical Activity Level of Hemodialysis Patients with Chronic Kidney Disease: Cross-Sectional Study

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Abstract

Objective: The aim of this study was to assess the health literacy of patients receiving hemodialysis and to determine the relationship between health literacy, quality of life, and physical activity level.

Methods: The study was conducted in a cross-sectional design with 113 hemodialysis patients who met the inclusion criteria and who were treated at a Private Dialysis Center between September and October 2023. Personal Information Form, European Health Literacy Scale Turkish Adaptation, International Physical Activity Questionnaire Short Form, and Kidney Disease Quality of Life Scale were used for data collection. Data were analyzed using percentage distributions, means, standard deviation, median values, Pearson and Spearman Correlation Analysis, Chi-Square Test, One-Way Analysis of Variance, Kruskal-Wallis Analysis of Variance, and $p<0.05$ was accepted as the cut-off value for statistical significance.

Results: The health literacy level of hemodialysis patients was found to be "problematic" with a mean total scale score of 25.9±82 points. 48.7% of the patients had low physical activity level. Statistical differences were found between personal characteristics such as age, marital status and educational status and health literacy dimensions ($p<0.05$). While a statistically significant relationship was found between health literacy and physical activity value ($p<0.05$), no statistically significant relationship was found with quality of life ($p>0.05$).

Conclusions: Hemodialysis patients should be evaluated at regular intervals individualized interventions should be developed and patients should be guided to increase their health literacy and physical activity levels.

Keywords: Renal Insufficiency, Hemodialysis, Health Literacy, Sedentary Behavior, Quality of Life

1. Introduction

Chronic Kidney Disease (CKD) is an irreversible and progressive condition of kidney function caused by structural and functional changes in the kidneys. It is considered a public health problem due to its increasing incidence and prevalence in recent years (1). It is treated with life-saving renal replacement therapy such as hemodialysis (HD), peritoneal dialysis, or kidney transplantation. Patients experience high rates of functional impairment, morbidity and mortality over time (2).

Important factors contributing to poor outcomes in HD patients include disease-related low physical activity (PA), reduced muscle mass, decreased function and aerobic capacity, forced immobilization during HD sessions and fatigue (3). Several observational studies have shown that low PA is associated with high mortality in patients receiving HD (4, 5). Young et al. showed that the number of steps taken by HD patients during the day is low and PA on dialysis days is lower than on other days (6). Therefore, encouraging PA in HD patients may improve poor outcomes and quality of life (QOL) (7).

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QOL is defined by the World Health Organization as "an individual's perception of his/her position in life in the context of his/her own values and culture according to where he/she lives, wishes, ideas, concerns and expectations" (8). Individual awareness of each person's physical, mental, social, and functional well-being is important to understanding the possible relationships of treatments on quality of life. Dialysis treatment can negatively affect quality of life in terms of its impact on individuals' social/family relationships, physical and psychological well-being. Therefore, assessing the QOL of patients undergoing dialysis treatment is very important because it can increase their rehabilitation possibilities and improve their overall health (9). As the duration of HD treatment increases, patients experience a number of complications and this affects their QOL (10). Studies highlight QOL as a major concern in individuals with end-stage renal failure , as the progression of chronic diseases can be a barrier to life expectancy.

Health literacy (HL) is defined as "the personal knowledge and competencies that enable people to access, understand, evaluate and use information and services in ways that promote and sustain health and well-being for themselves and those around them" (11). An individual's HL skills are important for making decisions about their health. Studies in various patient populations show that limited health literacy is associated with less health-related information, increased risk of hospitalization, less use of preventive health services, decreased medication adherence, poorer health status, and higher healthcare costs (12). HL is extremely important for the care and clinical outcomes of patients, as this patient population needs to pay attention to dietary restrictions to maintain electrolyte and fluid balance, adhere to multiple medications to treat or prevent complications (13, 14). Advanced HL skills are required to manage this situation.

Studies using multidimensional assessment tools for HL show that patients with CKD have deficits in areas related to meeting health needs and understanding health information. Based on this deficiency, our study aimed to assess HL in patients receiving HD and to determine the relationship between HL, QOL, and PA level.

Research question:

What are the health literacy sub-dimensions of patients receiving hemodialysis?

Is there a relationship between health literacy, quality of life and physical activity level of patients receiving hemodialysis?

2. Methods

2.1.Research type, population and sample

This cross-sectional study was conducted to evaluate HL and to determine the relationship between HL, QOL, and PA level in individuals receiving HD treatment in a private dialysis center in a province in northwestern Turkey. The study population consisted of 187 individuals receiving treatment in a dialysis center. The study data were collected between September and October 2023 with 113 volunteer individuals with HD who met the inclusion criteria and agreed to participate in the study. Individuals between the ages of 18 and 65 years, who were cooperative enough to understand the tests and assessments, and who had been on HD treatment for at least six months were included in the study. In addition to CKD, those whose lower extremity functions were affected due to any disease and those who filled out the scale/survey incompletely or invalidly were excluded from the study.

2.2.Data collection instruments

Personal Information Form, European Health Literacy Scale Turkish Adaptation, International Physical Activity Questionnaire Short Form, and Kidney Disease Quality of Life Scale were used as data collection instruments. Data were collected in approximately 30 minutes through a face-to-face questionnaire

method. "Personal Information Form" consisted of five questions such as age, gender, marital status, educational status and disease history.

The adapted version of the "European Health Literacy Scale into Turkish" (HLS-EU-TR) was used to assess HL (15). Abacıgil et al. (2016) conducted validity and reliability studies of the scale and adapted it into Turkish. Cronbach's α value of the scale is 0.95 (15). The scale is a five-point Likert scale and consists of 47 items. 1: Very difficult, 2: Difficult, 3: Easy, 4: Very easy, 5: Don't know. The scale consists of three health-related dimensions such as service health care, disease prevention, and health promotion. The responses were used to calculate the sub-dimensions of health care, disease prevention, health promotion, and total HL. The total score was standardized with the help of a formula to take a value between 0-50. According to these scores, (0-25) points were categorized as inadequate, (>25-33) as problematic, (>33-42) as sufficient, and (>42-50) as excellent HL (15). In our study, the Cronbach's alpha coefficient of this scale was 0.92.

The International Physical Activity Short Form (IPAQ-Short Form), the Turkish validity and reliability of which was established by Öztürk et al. in 2005, was used to determine PA level (16, 17). In IPAQ, the duration of severe and moderate PA in the last week, walking, and one-day sitting times were recorded in minutes. These durations were converted to metabolic equivalents (METs) and PA scores were calculated (MET- minutes/week). Below 600 METs were classified as low-level PA, 600-3000 METs as moderate PA, and 3000 METs and above as high-level PA.

QOL was assessed with the Kidney Disease Quality of Life Scale (KDQOL). The scale was translated into Turkish and its validity and reliability was performed by Yıldırım et al. in 2007 (18). The cronbach's alpha value of the Turkish version is 0.93. The scale consists of kidney disease specific and general sections. The specific section consists of questions to identify problems specific to kidney disease, while the general section is based on the Short Form 36 (SF-36). The questionnaire contains 36 items divided into five dimensions. The section on kidney disease (24 items/ three dimensions) consists of three dimensions: symptom/problem list (12 items), impact of kidney disease (eight items) and burden of kidney disease (four items). The general section (12 items/two dimensions) consists of two dimensions: SF12 physical component (six items) and SF12 mental component (six items). The scale score ranges from 0 to 100. In our study, the Cronbach's alpha coefficient of this scale was 0.88.

2.3.Statistical analysis

SPSS 25.0 (IBM SPSS Statistics 25 software (Armonk, NY: IBM Corp.)) package program was used for data analysis. Continuous variables were expressed as mean ± standard deviation and categorical variables as number and percentage. When parametric test assumptions were met, a one-way analysis of variance was used to compare independent group differences; when parametric test assumptions were not met, Kruskal Wallis analysis of variance was used to compare independent group differences. Chi-Square test was used to compare categorical variables. Pearson and Spearman correlation analyses were used to examine the relationships between numerical variables. In all examinations, $p<0.05$ was considered statistically significant.

2.4.Ethics committee approval

Ethics committee permission was obtained from the Ethics Committee of Sakarya University of Applied Sciences and institutional permission was obtained from the unit manager where the study was conducted (decision dated 07.07.2023 and numbered 33/3). The research was conducted in accordance with the rules in the Declaration of Helsinki. Individuals were informed about the study beforehand. Informed consent was obtained from all individuals who volunteered to participate in the study.

3. Results

The mean age of HD patients was 57.8±5.96 years and 53.1% were male. 72.6% of the participants were married, had CRF for a mean of 7.75±6.09 years and had been on HD for a mean of 7.17±5.92 years. Hypertension was identified as the etiology of renal failure in 46.9% and 48.7% were found to have low-level PA (Table 1).

Table 1. Demographic and Clinical Characteristics

		Mean ± S.D	Med (IQR)	min - max
Age (year)		57.8 ± 5.96	60 (55 – 61.5)	38 - 70
Duration of CRF (year)		7.75 ± 6.09	6 (3 - 10)	1 - 32
Duration of dialysis (year)		7.17 ± 5.92	6 (3 – 9.5)	1 - 30
			n	**%**
Gender	Male		60	53.1
	Female		53	46.9
Marital status	Married		82	72.6
	Single		31	27.4
Education	Literate only		10	8.8
	Primary school		56	49.6
	Middle school		27	23.9
	High school		16	14.2
	University and above		4	3.5
Cause of kidney failure	Hypertension		53	46.9
	Glomerulonephritis		7	6.2
	Diabetes		29	25.7
	Urinary tract infections		5	4.4
	Urinary stones		2	1.8
	Polycystic kidney disease		8	7.1
	Idiopathic		9	7.9
IPAQ classification	Low		55	48.7
	Moderate		53	46.9
	High		5	4.4

CRF: Chronic Renal Failure, IPAQ: International Physical Activity Questionnaire,S.D: Standard Deviation, Med (IQR): Median (25th – 75th percentiles)

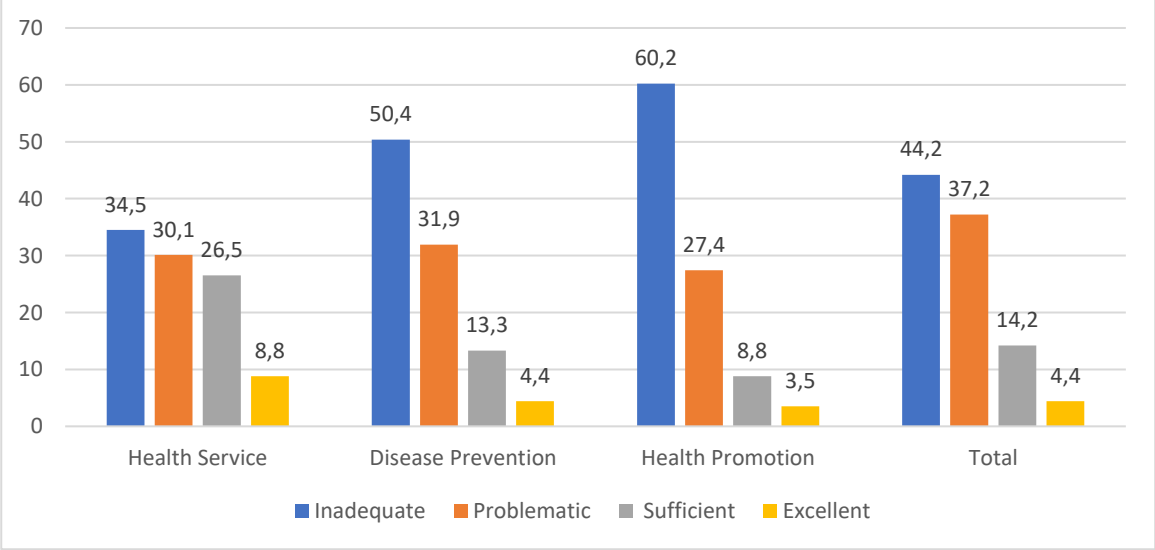
The mean HL total score of the participants was 25.9±8, indicating that these patients had problematic HL. When the HL sub-dimension averages were examined, individuals had problematic HL in the sub-dimensions of Health Service HL (29.37±9.28) and Disease Prevention HL (25.2±9.21), while they had inadequate HL in the sub-dimension of Health Promotion HL (22.7±9.05). The mean IPAQ value of the participants was 925.54 ± 921.93. When the mean scores of KDQOL subscale scores are analyzed, the highest score belongs to the "symptom problem list of kidney disease" subscale (75.59 ± 12.53) and the lowest score belongs to the "burden of kidney disease" subscale (31.43 ± 25.02) (Table 2).

Table 2. Distribution of Mean Scores on The European Health Literacy Scale, International Physical Activity Questionnaire Short Form and Kidney Disease Quality of Life Scale

	Mean ± S.D	Med (IQR)	min - max
HL Subdimensions			
Health service	29.37 ± 9.28	29.16 (22.91 – 34.89)	7.29 - 50
Disease prevention	25.2 ± 9.21	25.55 (20 – 31.11)	1.1 - 50
Health promotion	22.7 ± 9.05	22.61 (15.5 – 28.35)	6.25 - 50
Total	25.9 ± 8	25.88 (20.47 – 31.83)	3.9 - 50
IPAQ value	925.54 ± 921.93	610 (274.5 - 1386)	66 - 4751
Symptom problem list	75.59 ± 12.53	77.08 (66.67 – 85.42)	45.83 - 100
Effect of Kidney Disease	67.09 ± 17.01	68.75 (59.38 – 78.13)	18.75 - 100
Burden of kidney disease	31.43 ± 25.02	31.75 (18.75 – 62.5)	0 - 100
SF12 Physical component	36.68 ± 9.94	36.18 (29.28 – 44.09)	18.93 – 58.49
SF12 Mental component	46.71 ± 9.3	46.94 (41.15 – 54.17)	23.22 – 65.61

HL: Health Literacy, IPAQ: International Physical Activity Questionnaire, SF: Short Form, S.D: Standard Deviation, Med (IQR): Median (25th – 75th percentiles)

The total prevalence of inadequate or problematic levels in all dimensions of HL is above 64%. Inadequate or problematic literacy was found in 64.6% of patients in Health Care HL, 82.3% in Disease Prevention HL, 87.6% in Health Promotion HL and 81.4% in Total HL. Among all sub-dimensions, the highest sufficient HL (26.5%) and the highest excellent HL (8.8%) were reported in the Health Care HL (Graphic 1).



Graphic 1. Distribution of Proficiency Levels According to Health Literacy Sub-Dimensions

There was no statistically significant relationship with gender. When the relationships with age were examined, it was seen that health promotion and total scores had statistically significant, negative, and weak relationships (p=0.008, p=0.015). When analyzed according to marital status; it was seen that the scores of married and widowed individuals were significantly lower than single individuals in all sub-dimensions (p<0.05). When analyzed according to educational status, it was found that in all sub-dimensions, the scores of individuals with high school and above education were significantly higher than those of other educational levels (p<0.05) (Table 3).

Table 3. Comparison of The Mean Scores of Health Literacy Dimensions According to Individual Characteristics

		Health Service	Disease Prevention	Health Promotion	Total
Male	Mean ± SD	30.93 ± 8.36	26.18 ± 6.74	20.46 ± 8.52	26.46 ± 7.11
Female	Mean ± SD	27.61 ± 10.01	24.09 ± 11.34	25.24 ± 9.04	25.27 ± 8.93
	p	0.057 (t=1.922)	0.243 (t=1.175)	0.053 (t=1.355)	0.431 (t=0.79)
Age	r	-0.171	-0.168	-0.249*	-0.228*
	p	0.070	0.075	0.008	0.015
Married	Mean ± SD	27.96 ± 9.45	23.59 ± 8.86	20.9 ± 8.11	24.77 ± 7.6
Single	Mean ± SD	35.88 ± 10.58	34.84 ± 9.51	32.55 ± 12.28	33.84 ± 9.25
Widow	Mean ± SD	28.85 ± 8.82	26.51 ± 7.12	24.66 ± 7	26.19 ± 6.64
	p	0,045* (f=3,185) 1-2	0,003* (kw=11,417) 1-2	0,0001* (f=9,969) 1-2, 2-3	0,001* (f=6,905) 1-2, 2-3
Literate only	Mean ± SD	24.27 ± 10.47	20.28 ± 12.13	21.05 ± 8.21	21.17 ± 9.4
Primary school	Mean ± SD	27.25 ± 8.91	23.43 ± 8.79	21.07 ± 10.06	23.97 ± 7.85
Middle school	Mean ± SD	31.13 ± 6.89	27.41 ± 7.24	21.87 ± 7.88	27.01 ± 5.82
High school and above	Mean ± SD	35.51 ± 9.49	29.65 ± 9.19	29.25 ± 9.97	32.2 ± 6.71
	p	0,001* (f=5.914) 1-4, 2-4	0.009* (f=4.021) 1-4, 2-4	0.007* (kw=12.163) 2-4,3-4	0.0001* (f=7.728) 1-4, 2-4

HL: Health LİteracY, SD: Standard Deviation, Med (IQR): Median (25th – 75th percentiles), F: One Way Analysis of Variance, kw: Kruskal Wallis Variance Analysis, cs: Chi-Square test, r: Spearman Correlation Coefficient, *p<0.05 statistically significant.

There was a statistically significant, positive and moderate correlation between PA value and all HL dimension scores (r=0.454, p=0.000; r=0.433, p=0.000; r=0.462, p=0.000; r=0.404, p=0.000). No statistically significant relationship was found between HL sub-dimensions and QOL sub-dimensions (p>0.05) (Table 4).

Table 4. The Relationship Between Health Literacy Dimensions, Quality of Life Subdimensions and Physical Activity

		Health Service	Disease Prevention	Health Promotion	Total
IPAQ value	r	**0.454*** s	**0.433*** s	**0.462*** s	**0.404*** s
	p	0.000	0.000	0.000	0.000
Symptom problem list	r	0.082 s	0.045 s	-0.041 s	0.110 s
	p	0.388	0.634	0.669	0.248
Effect of kidney disease	r	-0.015 s	0.015 s	0.025 s	0.027 s
	p	0.878	0.871	0.792	0.776
Burden of kidney disease	r	0.139 s	0.051 s	-0.031 s	0.073 s
	p	0.141	0.591	0.745	0.443
SF12 Physical component	r	0.111 pr	-0.009 s	0.054 pr	0.092 pr
	p	0.243	0.923	0.566	0.331
SF12 Mental Component	r	0.184 pr	0.149 s	0.095 pr	0.145 pr
	p	0.052	0.115	0.315	0.112

HL: Health Literacy, IPAQ: International Physical Activity Questionnaire, SF: Short Form, s: Spearman correlation coefficient, pr: Pearson Correlation Coefficient, *p<0.05 statistically significant correlation.

4. Discussion

In our study, the mean HL total score of HD patients was 25.9±82 indicating that they had problematic HL. When the HL sub-dimension averages were examined, it was found that individuals had problematic HL in the health service HL (29.37±9.28) and disease prevention HL (25.2±9.21) dimensions, while they had inadequate HL in the health promotion HL (22.7±9.05) dimension. In a study conducted with individuals with CKD, it was reported that they had inadequate HL according to the average HL total score (19). In a study of Portuguese participants, the mean HL total score was 22.04 ±9.66 and 61.8% were shown to have inadequate health literacy (20). In a study in individuals with stage 4-5 CKD, low HL was found in 72 of 109 patients (66.1%) (21). In a study conducted in elderly individuals, when the mean scores of HL sub-dimensions were examined, problematic HL was found in health care, and inadequate HL was found in disease prevention and health promotion HL (22). In the light of the information in the literature supporting our study, it is important to strengthen the HL of individuals receiving HD treatment. This increases their ability to cope with the disease and enables them to use health services effectively.

In our study, 48.7% of HD patients were found to have low PA. In a recent study conducted to evaluate the PA level of HD patients, it was observed that the PA levels of HD patients were significantly reduced compared to the healthy control group and 72% of them had low PA levels (23). A study of Turkish dialysis patients found that 78.12% of patients had low PA level and only 1% had high PA level (24). Oliveira et al. compared the PA levels of patients receiving HD and conservative treatment for more than six months and less than six months and found no significant difference between the groups. In all groups, low PA was seen in the majority of individuals (25). Similar results were found in studies in the literature. Therefore, it is very important to evaluate HD patients, raise awareness, provide education and recommend PA to individuals.

When the QOL subscale mean scores were analyzed in our study, it was found that the highest score belonged to the "symptom/problem list" subscale and the lowest score belonged to the "burden of kidney disease" subscale. In a study conducted to examine QOL in HD, it was found that the highest score belonged to the "symptom/problem list" (60.41) and the lowest score belonged to the "burden of kidney disease" (18.75) sub-dimension (26). Similarly, the burden of kidney disease was found to be the lowest dimension in different studies in the literatüre (27). In our study, the proficiency levels of HL sub-dimensions were found to be low. Patients had inadequate or problematic literacy in all HL sub-dimensions. Silva and Pimenta found the total prevalence of inadequate and problematic levels in all dimensions of HL to be over 60% (28). In a study conducted in Japan to determine HL in individuals with CKD, patients were classified as "limited" with an total HL of 81%, health care HL of 80.5%, disease prevention HL of 64.5% and health promotion HL of 83.5% (29).

In our study, it was found that the HL scores of married and widowed individuals were significantly lower than those of single individuals, and the HL scores of individuals with high school and above education were significantly higher than those of other education levels. Uğurlu et al. found a significant relationship between gender and HL, and the mean score of female on the HL scale was found to be lower than that of male (30). In addition, a statistically significant difference was found between educational level and HL and it was found that university graduates caused this difference (30). In a study conducted in different age groups, it was reported that participants with lower education level had lower HL scores (31). Bezerra et al. associated marital status with inadequate HL levels (32). In line with the information in the literature, it is shown that individual factors can affect HL.

In our study, a statistically significant relationship was found between PA and HL dimensions. In a study conducted in CKD patients, it was shown that HL was significantly and positively associated with self-care behaviors such as diet and exercise (33). A study of older adults found that low HL was associated

with inadequate PA (34). Older people with inadequate HL were 38% less likely to engage in physical activity at least five days a week compared to those with adequate HL (35). A review on HL and PA found a significant positive association between high HL and high PA (36). Therefore, HL should be included in health promotion programs as a factor that improves physical performance.

In the literature, different results were found in studies evaluating the relationship between HL and QOL. In a recent study, a relationship was found between literacy and patients' QOL and it was found that for each additional point obtained in HL, the QOL score increased by 0.78 points (28). In a study on CKD, individuals with high levels of HL were found to have better QOL (37). Contrary to these findings in the literature, no statistically significant relationship was found between HL and QOL in our study. Green et al. did not report a significant relationship between HL and QOL (12). Similarly, Shayan et al. found no association between HL and QOL in diabetic and non-diabetic HD patients (38).

5. Conclusion and Recommendations

In our study, HD patients were found to have problematic HL. Statistical differences were found between HL dimensions and individual characteristics such as age, marital status and educational status. While there was a statistically significant relationship between HL and PA, there was no significant relationship with QOL.

HL level plays a vital role in the management of CKD-related complications. HL needs to be given more importance in these patients. To increase HL, patients' HL levels should be determined and patient-specific education programs should be identified and implemented. A sedentary lifestyle is associated with disease progression and death. PA should be assessed in HD. Future guidelines should provide guidance on individualized physical activity, safety precautions and exercise. Intervention programs to increase HL levels should be developed to maintain and improve patients' QOL. Dialysis nurses who closely care for dialysis patients and physiotherapists who will support increasing physical activity levels should be trained on this subject, and it may be suggested that more audiences can be reached through the effective use of technology in these trainings.

Limitations

The fact that the study was conducted in a single center is among its limitations. Physical activity level was considered based solely on the IPAQ. More objective devices such as pedometer and accelerometer may be used in future studies.

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Research Article

Determination of Women's Fertility Awareness Levels and Influencing Factors

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Abstract

Objective: In the present study, it was aimed to determine the fertility awareness levels of women of reproductive age and the factors affecting them.

Methods: The sample of the cross-sectional study based on the general survey model using a quantitative approach included 686 women aged 18-49 years who met the inclusion criteria. The data were collected online via Google Forms using the Personal Information Form and Fertility Awareness Scale (FAS). Descriptive statistics, independent samples t-test and one-way ANOVA test were used to evaluate the data. Statistical significance was taken as $p<0.05$.

Results: The mean age of the participants was 29.56±7.68 years (min:18 and max:50). The mean total score of the fertility awareness scale was 61.31±12.53, and the mean total scores of the sub-dimensions were 35.10±8.08 for physical awareness and 26.21±5.60 for cognitive awareness. When we look at the factors affecting the level of fertility awareness; age, educational status, employment status, occupation, presence of infertile individuals in the environment, research on fertility health and receiving fertility health education were found to be significantly related to the level of fertility awareness, while marital status was not.

Conclusion: In the study, it was determined that women's fertility awareness level was at an intermediate level. It is predicted that trainings to be organized to increase the fertility awareness levels of health professionals, especially midwives, who are the most important care and counseling providers in women's reproductive health, will contribute to the protection of fertility health.

Keywords: Fertility Awareness, Fertility, Women's Health, Midwifery

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1. Introduction

Fertility awareness is of increasing interest and importance worldwide (1). While decisions about whether or not to have children, when and how to have children are a matter of personal preference, choices in this area of life are about having the right information and awareness (2). Especially in the modern world, people's career, education and Situations such as postponing parenthood due to relationship and financial problems, changing daily activities and lifestyles due to developing technology, and increasing the incidence of non-communicable diseases such as obesity, diabetes and thyroid disorders have negative effects on fertility health (3,4). Lifestyle behaviors and personal factors affect fertility. Understanding how it affects fertility is very important to maximize fertility results and minimize fertility-related complications. It also enables women to transform their risky behaviors by being aware of the impact of their lifestyle on fertility health and thus to control their fertility potential (5,6). Providing fertility awareness is an important factor, especially for the reproductive life of women. Because this awareness plays a key role in preventing fears and concerns about fertility. Informing women about fertility and adjusting their obstetric care accordingly is of great importance for public health (7,8).

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Reproduction is a basic human instinct, and fertility often plays a decisive role in women's health. Having good pre-pregnancy health and determining women's fertility awareness and increasing their awareness through training; It helps ensure successful pregnancies, healthy babies and the health of future generations. In this regard, this study aims to determine the fertility awareness levels of women of reproductive age and the affecting factors.

2. Methods

2.1. Research design

This research, in which the quantitative approach was used, was conducted in a cross-sectional design based on the general screening model.

2.2. Research sample

The sample of the study consisted of 686 women living in Turkey who met the inclusion criteria. The inclusion criteria were women between the ages of 18-49, who were able to read Turkish, who had the technological infrastructure to fill out online forms, and who volunteered to participate in the study.

2.3. Data collection

Data for the research were collected online through electronic forms (Google Forms) during the period April-July 2023. The link to the online questionnaire created on Google Forms was sent to the participants via various networks (e-mail, WhatsApp, Facebook, etc.). The online form, which each participant could fill out in about 15 minutes, was organized in such a way that participants could see all questions at the same time after logging in. In order to prevent data loss, Google Forms settings were adjusted so that no question could be left blank and all questions had to be answered.

2.4. Data collection tools

"Personal Information Form" and "Fertility Awareness Scale" were used to collect the data. In the Personal Information Form prepared by the researchers, there are 23 questions questioning women's socio-demographic characteristics (age, education level, employment status, income level, marital status) and fertility characteristics (number of pregnancies-births, infertile diagnosis, presence of infertile individuals around, receiving education on fertility health, etc.). The Fertility Awareness Scale (FAS) developed by Özşahin and Aksoy Derya (2022) is a valid and reliable measurement tool that aims to measure women's fertility awareness levels (8). The FAS is a Likert-type scale consisting of 19 items and two dimensions (Physical awareness and cognitive awareness). The assessment of the scale has a five-point Likert structure (1: Never, 2: Rarely, 3: Occasionally, 4: Most of the time, 5: Always). The lowest total score that can be obtained from the scale, which has no reversed items, is 19 and the highest total score is 95. The lowest and highest scores to be obtained from the sub-dimensions are 10-50 for Physical Awareness and 9-45 for Cognitive Awareness. In the evaluation of the FAS, the level of awareness increases as the total score increases, and if the total score is between 19-43, "awareness is low", if the score is between 44-69, "awareness is moderate", and if the score is between 70-95, "awareness is high". The cronbach alpha internal consistency coefficient for the total FAS scale was 0.887. The cronbach alpha internal consistency coefficient for the sub-dimensions was 0.623 for Physical Awareness and 0.659 for Cognitive Awareness (8). In this study, the cronbach alpha reliability coefficient was 0.828 for the total FAS, 0.786 for the Physical Awareness Subdimension and 0.598 for the Cognitive Awareness Subdimension.

2.5. Data evaluation

The data of the study were analyzed using SPSS 22.0 (Statistical Package for Social Sciences) software. The sociodemographic, obstetric and fertility health characteristics of the participants were analyzed

using descriptive statistics (percentage, frequency, minimum-highest and median values). Frequency, percentage and median values were used in the analysis. Kolmogorov-Smirnov analysis, skewness kurtosis values, box plot and Normal Q-Q plot were used for the conformity of the data to normal distribution. For normally distributed data, parametric test statistics "t-test in independent groups" was used to compare the measurement values of two independent groups and "One-way ANOVA" was used to compare three or more independent groups. Statistical significance value was taken as $p<0.05$.

2.6. The ethical dimension of the research

Ethics committee approval for the current study was obtained from the Non-Interventional Clinical Research Ethics Committee of a state university (Meeting Date-Number: 05.04.2023-2023/04 and Decision No: 2023/04-12). Care was taken to ensure that the participants included in the study were voluntary and willing, and it was stated that they were free to participate in the study or not. The research was conducted in accordance with the rules of the Declaration of Helsinki.

3. Results

The mean age of the women who participated in the study was 29.56±7.68 years (min:18 and max:50). Information about the descriptive characteristics of the participants is presented in Table 1.

Table 1. Distribution of Participants According to Their İdentifying Characteristics

Variable (N=686)	n	%
Age groups		
18-29	399	58.2
30 and above	287	41.8
Education level		
Middle School	95	13.8
High School	192	28.0
University	195	28.4
Postgraduate	204	29.7
Employment status		
Working	334	48.7
Not working	352	51.3
Occupation		
Health professional	195	28.4
Other	491	71.6
Place of residence		
Province	527	76.8
District	117	17.1
Town-village	42	6.1
Income Level		
Income less than expenditure	184	26.8
Income matches expenditure	386	56.3
Income more than expenditure	116	16.9
Marital status		
Married	372	54.2
Single	314	45.8
Total	686	100

When the obstetric and fertility health characteristics of the participants given in Table 2 were examined, it was found that 384 women (55.8%) had never experienced pregnancy, 405 (59.0%) had never given birth, 411 (59.9%) had experienced fear of not being able to conceive, 374 (54.5%) had individuals diagnosed as infertile in their environment, 348 (50.7%) had done research on fertility health, and 464 (67.6%) had received fertility health education.

Table 2. Distribution of Participants According to Obstetric and Fertility Health Characteristics

Variable (N=686)	n	%
Number of pregnancies		
None	383	55.8
Primigravida	107	15.6
Multigravida	196	28.6
Number of births		
None	405	59.0
Primiparous	107	15.7
Multipar	174	25.1
Fear of not being able to pregnant		
Yes	275	40.1
No	411	59.9
Presence of infertile individuals in the environment		
Yes	374	54.5
No	312	45.5
İnfertilite tanısı alma		
Yes	27	3.9
No	659	96.1
Research on fertility health		
Yes	348	50.7
No	338	49.3
Receive fertility health education		
Yes	222	32.4
No	464	67.6
Total	686	100

Table 3 presents the findings regarding the responses to the measurement tool. When the reliability coefficient was analyzed, it was determined that the answers given for the Fertility Awareness Scale were reliable (Table 3).

Table 3. Distribution of Participants' Total and Subscale Scores on the Fertility Awareness Scale

Scale (n=686)	Mean±SD	Median	Min. - Max.	Cronbach-α coefficient
Physical awareness	35.10±8.08	37.0	12.0 - 50.0	0.786
Cognitive awareness	26.21±5.60	26.0	11.0 – 44.0	0.598
Scale total	61.31±12.53	63.0	25.0 - 91.0	0.828

In the study, a statistically significant difference was found in the sub-dimension and total scores of the Fertility Awareness Scale according to age group (t=2.666, p=0.008; t=2.201, p=0.028; t=2.690 p=0.007, respectively). The scores in the 18-29 young adult age group were significantly higher than those in the 30 and over middle adult age group (Table 4). According to the educational status of the participants in the study, there was a statistically significant difference in terms of FAS sub-dimension and total scores (F=41.647, p=0.000; F=7.991, p=0.000; F=28.324 p=0.00, respectively). According to the results of the Post-Hoc Tamhane's T2 test applied to determine between which subgroups the educational status differed, high school graduates had higher scores than middle school, university graduates had higher scores than high school and middle school, and postgraduate graduates had higher scores than the others. The difference was statistically significant in terms of total and physical awareness sub-dimension scores according to employment status (t=3.420, p=0.001; t=4.118, p=0.000, respectively). The scores of working women were significantly higher than those of non-working women (Table 4). There was a statistically significant difference in the sub-dimensions and total scores of the FFQ according to the occupations of the women (t=5.783 p=0.000; t=3.082 p=0.002; t=5.075 p=0.000,

respectively). Women who were health professionals had significantly higher scores than women in other professions (Table 4).

It was determined that there was a statistically significant difference in terms of total and physical awareness sub-dimension scores according to the presence of infertile individuals in the environment (t=2.788, p=0.005; t=3.162, p=0.002, respectively). The scores of women who had infertile individuals in their environment were significantly higher than those who did not (Table 4). The difference was found to be statistically significant in terms of FQF sub-dimensions and total scores according to research on fertility health (t=7.954, p=0.000; t=5.190 p=0.000; t=7.470 p=0.000, respectively). The scores of women who conducted research were significantly higher than those who did not (Table 4). The difference was statistically significant in terms of FQF subscale and total scores (t=10.744, p=0.000; t=8.205 p=0.000; t=10.770 p=0.000, respectively). The scores of women who received training were significantly higher than those who did not (Table 4).

Table 4. Comparison of total and Subscale Scores of Fertility Awareness Scale With Some Variables

Variables	n	Physical awareness Mean±SD	Cognitive awareness Mean±SD	Scale total Mean±SD
Age group				
18-29	399	35.81±7.49	26.61±5.40	62.42**±**11.73
30 and above	287	34.11±8.75	25.66±5.83	59.77**±**13.43
Statistical analysis*		**t=2.666**	**t=2.201**	**t=2.690**
Possibility		**p=0.008**	**p=0.028**	**p=0.007**
Education level				
Middle School	95	28.41±8.67	23.73±5.25	52.14±13.30
High School	192	33.53±8.82	26.22±5.68	59.75±13.55
University	195	37.35±6.37	26.64±5.65	63.99±10.53
Postgraduate	204	37.54±6.28	26.95±5.35	64.50±10.51
Statistical analysis*		**F=41.647**	**F=7.991**	**F=28.324**
Possibility		**p=0.000**	**p=0.000**	**p=0.000**
Marital status				
Married	372	34.77±8.69	26.16±5.77	60.94**±**13.32
Single	314	35.49±7.29	26.27±5.40	61.76**±**11.52
Statistical analysis*		t=1.183	t=0.236	t=0.868
Possibility		p=0.237	p=0.813	P=0.386
Employment status				
Yes	334	36.38±7.64	26.59±5.85	62.98**±**12.21
No	352	33.88±8.31	25.85±5.33	59.73**±**12.61
Statistical analysis*		**t=4.118**	t=1.733	**t=3.420**
Possibility		**p=0.000**	p=0.084	**p=0.001**
Occupation				
Health professional	195	37.97±6.93	27.40±5.47	65.37±11.39
Other	413	34.29±8.09	25.88±5.76	60.17±12.59
Statistical analysis*		**t=5.783**	**t=3.082**	**t=5.075**
Possibility		**p=0.000**	**p=0.002**	**p=0.000**
Presence of infertile individuals in the environment				
Yes	374	35.99±7.70	26.54±5.36	62.54±11.79
No	312	34.03±8.41	25.81±5.86	59.84±13.24
Statistical analysis*		**t=3.162**	t=1.703	**t=2.788**
Possibility		**p=0.002**	p=0.089	**P=0.005**
Research on fertility health				
Yes	348	37.42±6.90	27.29±5.28	**64.71**±10.96
No	338	32.71±8.51	25.10±5.71	**57.81**±13.08

Statistical analysis* Possibility		**t=7.954 p=0.000**	**t=5.190 p=0.000**	**t=7.470 p=0.000**
Receive fertility health education Yes	222	39.06±5.69	28.63±5.36	67.70±9.73
No	464	33.20±8.37	25.05±5.34	58.26±12.57
Statistical analysis* Possibility		**t=10.744 p=0.000**	**t=8.205 p=0.000**	**t=10.770 p=0.000**

* In the data with normal distribution, "t-test in independent groups" test statistics were used to compare the measurement values of two independent groups and "One-way ANOVA" test statistics were used to compare three or more independent groups.

4. Discussion

Understanding fertility and the reproductive cycle is essential both for the effective use of contraceptives and for planning pregnancy. In particular, inadequate fertility awareness is known to be a major contributing factor to the failure of many couples to achieve their goal of parenthood (2). In this study, which was conducted to determine the fertility awareness levels of women of childbearing age and the factors affecting them, it was determined that the fertility awareness levels of the participants were at an intermediate level. Similarly, in Özşahin's (2020) study, fertility awareness was determined as medium level, and in Özşahin and Altıparmak's (2021) study, it was reported that fertility awareness was high in more than half of the participants (7,10). While studies in the literature emphasize the significant lack of knowledge on fertility awareness, it is important to consider the need for education on this issue (8,11,12,13).

When the factors affecting the level of fertility awareness are analyzed, it is seen that age is an important variable. Because it is estimated that the tendency to postpone childbearing affects age-related fertility awareness (14). In our study, the awareness of the 18-29 age group was found to be significantly higher than the 30 and over age group (Table 4). Similarly, it is stated in the literature that there is a decrease in fertility awareness levels with advancing age and that women are mostly aware of the possible difficulties they may encounter in conception if they postpone childbearing (15,16).

In our study, another factor affecting fertility awareness was educational status and it was found that the level of fertility awareness increased with increasing educational level (Table 4). It was determined that the results of other studies in the literature were similar to our findings (12,17). Özşahin and Altıparmak (2021) also found that there was a significant correlation between educational level and fertility awareness and that those with a university degree had higher scale scores (10). At this point, it can be concluded that women with a higher level of education have a higher level of knowledge about the importance of fertility, fertility options, fertility probability and especially the potential risks associated with infertility, but it should not be ignored that every woman who receives effective counseling can learn what the changes in her body mean and have control over her fertility (8,18).

In our study, fertility awareness level was analyzed according to marital status and it was found that being married or single did not make a significant difference in terms of fertility awareness (Table 4). In another study conducted with students, the level of fertility knowledge was found to be higher in married students compared to single students (19). It is thought that this may be due to the difference in the sample groups of the two studies.

In our study, it was found that the employment status of the participants affected the level of fertility awareness, and it was observed that working women had higher levels of awareness (Table 4). This may be associated with many factors such as higher education levels, social relations and information sources of working women. In addition, the occupation of the participants in the study was also a determining factor in the level of fertility awareness (Table 4). The higher level of awareness of women who are health professionals compared to other occupational groups may be related to understanding

the anatomy and physiology of the reproductive system and the relationship between them and being more aware of the factors that may negatively affect fertility (4,8). However, contrary to this view, there are also studies indicating that the awareness of health professionals is lower (16,20).

It is known that the people in the immediate environment and their opinions and experiences play an important role in women's decisions, especially regarding their fertility (21). In our study, the awareness levels of those who were surrounded by infertile individuals were found to be significantly higher (Table 4). This may be due to the fact that the attitudes of individuals are influenced by the social environment, and people who observe a negative situation think of genetic factors and associate them with themselves.

In our study, the level of fertility awareness was found to be high among women who conducted research on fertility health and received education on fertility health (Table 4). This result shows that education has an important place in raising awareness of women about fertility health and is an effective dynamic in dealing with misinformation and attitudes. It is a fact that education always has a positive effect on improving knowledge, attitudes and awareness. In the literature, it is important to determine the factors affecting the level of fertility awareness and to organize education programs with emphasis on preventable risk factors (5,10).

5. Conclusion and Recommendations

In the study, it was determined that the fertility awareness level of the women was at a moderate level, and it was found that age, educational status, employment status, occupation, presence of infertile individuals in the environment, research on fertility health and receiving fertility health education were associated with the fertility awareness levels of the participants. This study emphasizes the importance of information and trainings to be given by health professionals in order to have accurate knowledge and awareness about fertility health, which has an impact on women's quality of life. It is predicted that trainings to be organized to increase the fertility awareness levels of health professionals, especially midwives, who are the most important care and counseling providers in women's reproductive health, will contribute to the protection of fertility health. In addition, it is recommended to enrich the literature on fertility awareness in different and larger sample groups due to the limited number of studies on the subject in our country.

Limitations

The data used in the present study were filled in according to women's self-reports. For this reason, the data represent only the women who participated in the research.

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Research Article

The Association of Parental Feeding Style and Sociodemographic Characteristics with Child Anxiety in Preschool Children

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Abstract

Objective: This descriptive, cross-sectional study aims to determine the relationship between parent feeding style and anxiety in children.

Methods: The research was conducted with 338 mothers with children aged 3-6 years. Sociodemographic Information Form, Revised Preschool Anxiety Scale and the Parent Nutrition Style Questionnaire were used for data collection.

Results: The mean Preschool Anxiety Scale scores significantly differed concerning the number of children's siblings, mothers' employment, fathers' employment, mothers' education, fathers' education and family income. There was a significant positive weak correlation between anxiety levels and the mean scores on emotional feeding, instrumental feeding and the Parent Nutrition Style Questionnaire.

Conclusion: Health professionals should be aware of several sociodemographic features that affect anxiety in children. Therefore, families at risk should be identified, their children should be closely monitored in terms of health problems like anxiety and depression, and appropriate interventions should be designed to prevent anxiety in children. Considering that parental feeding style affects eating habits in children, further studies are needed to examine the relationship between parental feeding behavior and anxiety in children.

Keywords: Parental Feeding Style, Anxiety, Preschool

1. Introduction

Nutrition is one of the most essential elements of child development. Eating habits acquired in the preschool period affect health in adulthood. Children accept their parents as role models and realize their first learning by imitating individuals around them (1). Parental feeding style, a subset of general parenting style, is a framework how parents react to their children's hunger and fullness cues (2). Studies have shown that parents reporting symptoms of stress, anxiety, and depression more frequently adopt strict-controlling, permissive and indifferent feeding than those without these symptoms (3, 4).

Anxiety can appear at different places and times, and occasional anxiety in children is considered part of their normal development. Several factors like separation of children from their parents, caregivers or siblings (5), familial traumatic events (grief, violence, abuse, conflicts and divorces) (6), and overprotective attitudes and behaviors of parents (7) cause children to feel anxious. Anxious preschoolers can be nervous and touchy, making it difficult to leave their parents. They do not want to go to school, may experience difficulty sleeping, wet themselves at night and have nightmares (5).

Anxiety disorders are one of the most common psychiatric disorders in children and teenagers (8), and the rate of anxiety disorders in preschoolers ranges from 5.2% to 22.2% (9, 10). Tosun and Zorlu (11) found in a study with Turkish third-grade students that 4.3%-12% of the male students and 1.1%-6.7%

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of the female students had high anxiety levels. Göker et al. (12) reported that of 1910 children and teenagers aged 4-18 years, 7.6% had at least one anxiety disorder.

It can be expected that children can experience a certain level of anxiety depending on their age. However, when their anxiety levels increase and reach an extent that will affect the quality of their lives, it is important for parents and teachers to know and keep its causes under control. Nutrition a physiological event and but also a special moment shared with the family when social and psychological needs are fulfilled. Although there have been many studies on the relation between parental psychology and style and the psychosocial status of children (13, 14), a limited number of studies have focused on the relation between parental feeding style and anxiety development in children (15). Therefore, the present study aimed to determine the relationship between parental feeding style and anxiety in children. Parents' attitudes and behaviors have an important effect on children's physical and psychosocial development (13). Therefore, the results of the present study will be important in taking appropriate measures earlier in the interest of both parents and children.

Research questions:

1. Are there statistically significant differences in the anxiety scores of children based on their sociodemographic characteristics?
2. Based on sociodemographic variables, are there statistically significant differences in parental feeding style?
3. How much does the mean score on instrumental and emotional feeding predict anxiety in children?

2. Methods

2.1. Design

This was a descriptive and cross-sectional study.

2.2. Settings and sample

The study was performed with mothers whose 3-6-year-old children attended a state kindergarten in a city in the western part of Türkiye. G*Power was utilized to make a power analysis based on a reference study by Boucher (16), and a sample size of 317 was determined. Power was computed for the multiple regression analysis with power set at 0.8, an α of 0.05 and a small-medium effect size. When data loss was taking into account, the sample size increased by 10%, and the study sample reached 338. Mothers with children between the ages of 3 and 6 who were enrolled in a kindergarten affiliated with the National Education Directorate and had no health issues that could potentially impact their children's well-being, able to understand and speak Turkish, being at least literate, being 18 years of age or older, and not having any hearing or speech issues were included in the study.

2.3. Data collection

2.3.1. Sociodemographic information form

A sociodemographic information form was prepared to collect data from the mothers. It comprises questions about the gender and age of children, number of siblings and age, education, employment status, occupation and socioeconomic status of parents. Body Mass Index (BMI) was evaluated according to the World Health Organization's obesity classification for mothers (17). For children, a BMI < the 5th percentile was considered underweight, a BMI ≥ the 5th and ≤ the 85th percentiles was considered normal weight, a BMI > the 85th and ≤ the 95th percentiles was considered overweight, and a BMI > the 95th percentile was considered obese (18).

2.3.2. Revised preschool anxiety scale (RPAS)

Edwards et al revised the The Preschool Anxiety Scale and renamed it the Revised Preschool Anxiety Scale (RPAS) in 2010 (19). The scale is used to collect data from 3-6-year-old children's parents. It is a five-point Likert scale (zero= never true; four=mostly true) and composed of 30 items and four subscales: generalized anxiety, social anxiety, separation anxiety and specific fears. Güler (20) examined the validity and reliability of the RPAS in Turkish children aged 3-6 years. Cronbach's alpha was reported to be .90 for the Turkish version of the RPAS and ranged from .69 to .80 for its subscales (20). Cronbach's alpha coefficient was 0.90 for this study.

2.3.3. The parental feeding style questionnaire

The Parental Feeding Style Questionnaire (PFSQ) is a 27-item, five-point Likert scale (one= never; five= always) developed by Wardle et al. and used to collect parents' data. The scale had a four-factor structure, and Cronbach's alpha was reported to range between 0.67 and 0.83 for its subscales. This suggested that the PFSQ was valid and reliable (21). The scale was adapted into Turkish by Özçetin, Yılmaz, Erkorkmaz, and Esmeray (22). Its Turkish version has five subscales: emotional feeding, instrumental feeding, encouraging feeding, strict control over feeding and permissive feeding. Cronbach's alpha for the subscales of the Turkish version of the PFSQ was reported to range from 0.54 to 0.83 (22). Cronbach's alpha coefficient was 0.78 for this study.

2.4. Ethical considerations

Ethical approval for the study was obtained from the Noninvasive Research Ethics Board of a University (15/11/2018-E.7785), and written permission was taken from the national education directorate in the city where the kindergartens included in the study were located. The mothers included in the study were informed about the study, and they were told they could leave it at any time, and informed consent was obtained.

2.5. Data analysis

Data were analyzed with the Statistical Package for Social Sciences 22. Before statistical analyses, incomplete or inaccurate data were checked. Total scores on the scales were determined by adding scores on their items and, the normality of the data was checked using skewness and kurtosis. When skewness and kurtosis values ranged from -1 to +1, data were considered to have a normal distribution (23). It is recommended in the literature that these skewness and kurtosis values should be used when the sample size is >50 (23, 24). Therefore, parametric tests were utilized to make comparisons in terms of demographic variables. Pearson correlation test was used to determine relations between the scores on the scales, and independent samples t-test was used to compare the scores between two groups, and one-way ANOVA was used to compare the scores on the scales between at least three groups. The post-hoc analysis LSD was adopted to determine which groups differed from each other. As an important hypothesis in comparisons, the normality of the continuous scores and a sufficient sample size in each cell (n>25) were checked and achieved. The effects of emotional feeding and instrumental feeding on anxiety levels were evaluated using multiple regression analysis. Statistical significance was set at $p<.05$.

3. Results

The sociodemographic characteristics of the participants are presented in Table 1.

Table 1. Sociodemographic Characteristics of the Participants

Sociodemographic Characteristics	n=338
Age†	
Children	5.31 ± 0.76
Mothers	34.38 ± 4.88
Fathers	37.42 ± 5.07
Children's Gender§	
Female	176 (52.1)
Male	162 (47.9)
Number of siblings§	
None or one	272 (80.5)
More than two	66 (19.5)
Mothers' BMI†	26.27 ± 8.49
Mothers' BMI§	
Normal	188 (55.6)
Overweight	101 (29.9)
Obesity	49 (14.5)
Children's BMI§	
Underweight	37 (10.9)
Normal	229 (67.8)
Overweight	34 (10.1)
Obesity	38 (11.2)
Employment status (Mothers)§	
Employed	147 (43.5)
Unemployed	191 (56.5)
Employment status (Fathers)§	
Employed	323 (95.6)
Unemployed	15 (4.4)
Educational status (Mothers)§	
Primary school	38 (11.2)
Secondary school	41 (12.1)
High school	107 (31.7)
University	152 (45.0)
Educational status (Fathers)§	
Primary school	27 (8.0)
Secondary school	46 (13.6)
High school	92 (27.2)
University	173 (51.2)
Income status§	
Low	50 (14.8)
Middle	231 (68.3)
High	57 (16.9)

† *Mean ± SD*

§ *Frequencies*

The mean ages of the mothers, fathers and children were 34.38 ± 4.88, 37.42 ± 5.07 and 5.31 ± 0.76 years respectively. Regarding the other sociodemographic characteristics, 45% of the mothers and 51.2% of the fathers were university graduates, 56.5% of the mothers and 3.4% of the fathers were unemployed, and 68.3% of the parents reported having an income equal to their expenses. According to their body mass index (BMI), 11.2% of the children and 14.5% of the mothers were classified as obese.

Table 2. Mean Scores on the PFSQ and the RPAS with Standard Deviations

Scale Scores	N	Minimum	Maximum	Mean	SD	Skewness	Kurtosis
PFSQ	338	45	117	85,07	11,37	-0,306	0,675
RPAS	338	32	120	66,57	18,61	0,386	-0,471

Descriptive statistics about the participants' scores on the scales are shown in Table 2. The scores on the PFSQ ranged from 45 to 117, and the mean score on the questionnaire was 85.07 ± 11.37. The total RPAS score ranged from 32 to 120, and the mean RPAS score was 18.61 ± 18.61. Data about the scores on the PFSQ and RPAS had a normal distribution.

Table 3. Comparisons of the Scores on the PFSQ and RPAS According to Demographic Characteristics

		PFSQ		**RPAS**		
Demographic Characteristics	**N**	**Mean±SD**	**p**	**Mean±SD**	**p**	**Difference§**
Gender						
Female	176	84.86±11.23	.735†	67.18±19.24	.536†	
Male	162	85.28±11.56		65.92±17.94		-
Number of Siblings						
0-1	272	85.21±11.25	.636†	65.50±18.46	**.031**†	-
2 or more	66	84.47±11.94		71.00±18.73		
Mothers' Employment						
Unemployment	191	84.83±11.79	.662†	69.09±18.48	**.004**†	-
Employed	147	85.37±10.83		63.31±18.34		
Fathers' Employment						
Unemployed	15	87.80±14.31	.341†	76.40±14.77	**.036**†	
Employed	323	84.94±11.23		66.11±18.67		-
Mothers' Education						
Primary School (1)	38	83.74±12.13		74.68±19.98		
Secondary School (2)	41	85.80±13.12	.622‡	73.29±20.61	**.000**‡	***(4–1,2,3)***
High School (3)	107	84.27±11.91		67.14±17.97		***(3–1)***
University (4)	152	85.76±10.28		62.34±17.00		
Fathers' Education						
Primary School (1)	38	85.04±13.39	.091‡	80.63±18.65		
Secondary School (2)	41	86.83±11.24		73.91±19.15	**.000**‡	***(1–3,4)***
High School (3)	107	82.59±11.97		65.89±17.77		***(2–3,4)***
University (4)	152	85.92±10.61		62.79±17.42		
Perceived Income						
Less than expenses (1)	50	82.58±14.8	.233‡	75.84±20.11	**.000**‡	
Equal to expenses (2)	231	85.39±10.41		65.50±18.24		***(1–2,3)***
Higher than expenses (3)	57	85.95±11.63		62.81±16.39		
Mothers' BMI						
Normal	188	84.95±10.96	.077‡	64.56±18.2	.069‡	-
Overweight	101	86.66±11.19		68.44±19.43		
Obesity	49	82.20±12.85		70.45±17.84		
Children's BMI						
Underweight	38	85.35±12.28		66.46±20.43		
Normal	41	85.81±11.16	.185‡	66.62±18.01	.610‡	
Overweight	107	83.35±9.14		63.35±19.14		
Obesity	152	81.84±13.13		69.29±20.20		-

†*p-value for independent sample t-test;*
‡ *p value for ANOVA;*
§ *ANOVA followed by LSD posthoc testing*

The scores on the PFSQ did not significantly differ regarding demographic variables (p>.05). The results are summarized in Table 3. However, there was a significant difference in the RPAS scores in terms of the number of siblings, mother's employment, father's employment, mother's education, father's education, and family income (p<.05). The children with two or more siblings had a significantly higher RPAS score than those without a sibling or with one sibling (t= -2.165, p = .031). The children with unemployed mothers had a significantly higher score on the RPAS than those with employed mothers (t= 2.862, p = .004), and the children with unemployed fathers had a significantly higher score on the RPAS than those with employed fathers (t= 2.102, p = .036).

The one-way ANOVA revealed a significant relationship between the mean score on the RPAS and mothers' education (F= 7.224, p = .000), fathers' education (F= 10.804, p = .000) and socioeconomic status (F= 8.073, p = .000). To understand which variables were responsible for the differences, LSD adjustments were used. The children whose mothers were university graduates had significantly lower anxiety levels than those whose mothers were high school, secondary school, and primary school graduates (p<.05). Besides, the children whose mothers were high school graduates had a significantly lower anxiety level than those whose mothers were primary school graduates (p<.05). The children whose fathers were university or high school graduates had a significantly lower anxiety level than those whose fathers were secondary school or primary school graduates (p<.05). The children whose families had an income lower than their expenses had a significantly higher anxiety level than those whose families had an income equal to or higher than their expenses (p<.05). However, children's anxiety levels did not significantly differ in terms of their gender and BMI and mothers' BMI (p>.05).

There was a significant positive weak correlation between anxiety levels and the mean scores on emotional feeding (r = 0.234, p < .001), instrumental feeding (r = 0.229, p < .001) and the PFSQ (r=0.146, p<.01).

Table 4. Instrumental and Emotional Feeding Predicting Anxiety in Children

Variables	**Model 1** **B**	**Model 2** **B**	**Model 3** **B**
Instrumental feeding	.229*		.154*
Emotional feeding		.234*	.163*
R^2	.052	.055	.073
Adj. R^2	.050	.052	.068
F	18.615	19.423	13.238
p	.000	.000	.000
DW	1.949	1.922	1.926

*p<.05

The multiple regression analysis revealed models based on the relation between the subscales of the PFSQ and anxiety. According to Model 1, as the scores on instrumental feeding increased, so did the anxiety scores of the children and instrumental feeding was responsible for 5% of anxiety (R2:.052). A one-unit increase in the mean score on instrumental feeding caused a rise in anxiety by 0.229% times (β=.229). According to Model 2, as the mean score on emotional feeding increased, so did the anxiety scores of the children and emotional feeding accounted for 6% of anxiety (R^2:.055). A one-unit increase in the mean score on emotional feeding brought about a rise in anxiety by 0.234% times (β=.234). Instrumental feeding and emotional feeding were included in Model 3. The model showed that emotional feeding (β=.163, p<.05) and instrumental feeding (β= .154, p<.05) were significant predictors of anxiety in children (Table 4).

4. Discussion

It is thought that this study will contribute to determinning the factors related to parents that cause anxiety in preschool children. Based on this, the relationship between parental feeding style and sociodemographic variables with anxiety in preschool children was analyzed. According to the results of the analysis, children with two or more siblings had higher anxiety levels than those with no or one sibling. The present study was directed towards determining the effect of parental feeding style on anxiety in children. It was found that children with two or more siblings had higher anxiety levels than those with no or one sibling. As the number of siblings increased, so did children's anxiety. Demiriz and Ulutaş (25) also pointed out that as the number of siblings increased, so did state anxiety scores of children aged 9-12 years. Children can be deprived of parental love and attention, may not fulfill their needs and experience conditions increasing anxiety like jealousy due to a high number of siblings. This can have a negative effect on children's psychology and increase the risk of anxiety (25).

In the present study, the children whose parents were unemployed had higher anxiety scores than those whose parents were employed, which is consistent with the literature. Teze and Aslan (26) examined the relationship between separation anxiety and bonding styles, gender and employment status of mothers in 6-year-old children. They discovered that children having unemployed mothers obtained higher scores on the fear of abandonment as a subscale of separation anxiety than children having employed mothers (26). Besides, in the current study, the children from families with an income lower than their expenses felt more anxious than those with an income equal to or higher than their expenses, which is compatible with the literature. Bitsko et al. found out in their study, including children aged 6-17 years, that anxiety and depression were more common among older children and children from families with a low income (27). A low income brings about many problems. Financial difficulties, the inability of families to fulfill their basic needs and their children's needs, familial conflicts and difficulties in accessing education and healthcare services create stress and increase anxiety in family members (28). Therefore, children whose parents have low socioeconomic status and feel anxious have higher anxiety levels.

The current study also showed that as parents' education levels increased, children's anxiety levels decreased. It may be that parents with high education levels might have had a high awareness of anxiety in children and opportunities to improve themselves about the issue and created an environment filled with a wide variety of positive stimuli. Consistent with the findings of the current study, several studies have revealed that parental education plays an important role in psychosocial problems of children like anxiety and depression and that as parents' education levels rise, children's psychosocial problems decrease (27, 29).

In the present study, three regression models were created, taking account of the correlations between the mean scores on the subscales of the PFSQ and the mean score on the RPAS. Model 1 showed that the children with mothers adopting instrumental feeding had higher anxiety levels. Instrumental feeding accounted for 5% of anxiety in the children. Model 2 revealed that the children with mothers having an emotional feeding style had higher anxiety levels. Emotional feeding explained 6% of anxiety in children. Overall, 7 % of anxiety in the children was explained by emotional feeding and instrumental feeding ($F = 13.238$, $p < .001$). It can be suggested that instrumental feeding, which increases sensitivity to rewards, and emotional feeding cause children to experience more severe anxiety. Anxiety in children is associated with decreased risk-taking behavior and sensitivity to rewards (30). Instrumental feeding gives children food as a reward when they display a desirable behavior or consume food they do not like (21). Rewarding children with food reduces their food regulation and increases their emotional eating (31). It has been reported in the literature that children exhibiting emotional eating behavior experience anxiety and depression (32, 33). As a means of self-regulation, emotional feeding provides children with

comfort foods they enjoy when they are dissatisfied or sad (21). Houldcroft et al. (15) reported that general anxiety, social anxiety and depression in children had a positive relation with their emotional eating and parents' restricting food and pressuring them to eat. There is evidence that parental feeding style, generalized anxiety about social circumstances, emotional eating, social avoidance, discomfort in novel settings, and tolerant controlled feeding all have a role in the development of childhood obesity (34). Consequently, parents may observe that food has a soothing effect on their children, resulting in an increased tendency to encourage them to eat when when they are anxious. Nonetheless, given the link between feeding strategies and child anxiety, our data suggest that parents should adjust their feeding strategies. Besides, the present study's findings point out the need for further studies to examine the relationship between anxiety in children and instrumental and emotional feeding.

Although there has been a sufficient number of studies on the relation between children's eating behaviors and psychological status (13, 14), few studies have focused on the relation between parental feeding style and anxiety in children (15). Food neophobia, which is defined as unwillingness to eat food or avoidance of food, is associated with anxiety in children. In Maiz and Balluerka's study, neophobic children were shown to experience more significant anxiety than their peers (35). Menatti et al. also determined a relationship between social anxiety and pathological eating behavior(36). Considering that parental feeding style affects eating habits in children, further studies are needed to examine the relation between parental feeding behavior and anxiety in children.

5. Conclusions and Recommendations

In the present study, several sociodemographic features like the number of siblings, employment status of parents, education levels of parents, and family income were found to affect anxiety in children. Families with low socioeconomic status may experience anxiety due to financial difficulties, a high number of children and negative environmental conditions. Therefore, health professionals such as public health and pediatric nurses and doctors should identify families at risk, closely monitor children for health problems such as anxiety and depression, and design appropriate interventions to prevent anxiety in children. Another finding of the present study is that children with parents adopting instrumental feeding and emotional feeding had higher anxiety levels. This study is the first one to examine the relationship between parental feeding style and anxiety in children. Further studies are needed to elucidate the factors affecting the relationship between anxiety in children and emotional and instrumental feeding.

In summary, this study reveals that some sociodemographic variables and parental feeding styles affect anxiety in children. There is a need for further studies that examine the factors affecting the relationship between emotional feeding style and instrumental feeding style and the child's anxiety.

Limitations

In this study, we used parental self-reports to study how parental feeding style was connected with child anxiety. Therefore, one of this study's limitations was that the self-reported assessments of parental feeding style and child anxiety may not accurately reflect the participants' actual state. Additionally, there might be cultural variations across the country, which indicates that different parental feeding styles and perceptions may differ. Because of this, the study's conclusions cannot be generalized to all children in the country. Despite these limitations, we believe that our research contributes to a better understanding of the relationships between parental feeding style and child anxiety.

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Research Article

Determination of Nursing Students' Levels of Knowledge in Sexual Health/Reproductive Health during Emergency Status and Influencing Factors

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Abstract:
Objective: The aim is to determine nursing students' sexual/reproductive health knowledge levels and affecting factors in extraordinary situations.
Methods: This cross-sectional study was carried out with 356 nursing students between November-December 2023 at Bartın University of Health Sciences, Department of Nursing. Data were collected through a survey including the Introductory Information Form and the Sexual and Reproductive Health Knowledge Scale in Emergencies (SRHKSE).
Results: The mean age of nursing students was 20.53±2.57. The average score on the SRHKSE was 84.90±7.91. The sub-dimensions of the SRHKSE revealed the following average scores: women's health empowerment 46.17±4.72, material supply for implementing the minimum initial service package in emergencies 17.79±2.42, basic knowledge of the minimum initial service package in emergencies 10.07±1.27, and strategy and education for the minimum initial service package in emergencies 10.87±1.72. Nursing students who were female, in their 3rd year, had income exceeding expenses, had mothers with primary/secondary education, and had knowledge in reproductive and sexual health showed significantly higher SRHKSE scores (p<.001).
Conclusion: In our study, nursing students exhibited high levels of knowledge in sexual and reproductive health during emergency status. The levels of knowledge in sexual and reproductive health during emergency status were found to be affected by gender, academic year, income level, maternal education, and awareness of reproductive and sexual health. It is recommended to conduct different research on the subject and develop the literature.

Keywords: Nursing, Student, Emergency Status, Sexual/Reproductive Health, Knowledge

1.Introduction

Extraordinary situations are events that disrupt the everyday lives of individuals and communities. Disasters, outbreaks of diseases, and pandemics are some examples of extraordinary situations (1). The frequent occurrence of events such as conflicts, violence, and disasters globally over the last thirty years has led to a significant increase in the number of people adversely affected by extraordinary situations. Since it is unpredictable when and where extraordinary situations will arise, being prepared at all times is essential (2,3).

Access to Sexual and Reproductive Health (SRH) services is one of the fundamental human rights (4). Awareness of reproductive health needs in emergencies began in the mid-1990s, followed by the establishment of the Inter Agency Working Group for Reproductive Health (IAWG). The Minimum Initial Service Package (MISP), a guide for Reproductive Health service delivery in emergency environments, was created by the IAWG (5). MISP is recommended to be applied in the first 48 hours of the emergency (6). The main objectives of MISP are to facilitate the coordination of SRH services, reduce HIV transmission, minimize maternal and newborn morbidity and mortality, prevent and manage the

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consequences of sexual violence, and plan comprehensive SRH services in the post-crisis phase. During the implementation of MISP in extraordinary situations, problems such as insufficient awareness of emergencies and SRH knowledge, logistical difficulties, and weak/insufficient coordination may be encountered (7).

When the aims of MISP are examined, it is seen that the risk of sexual violence increases in unsafe environments. It is emphasized that the SRH rights of women, girls and boys should be protected in places where extraordinary situations occur (7). In emergency settings, sexually transmitted infections, including HIV, tend to increase and challenges may arise in accessing treatment and prevention services. Given that childbirth and miscarriages are unpredictable, uncontrollable events with uncertain locations and timing, providing hygienic environments for pregnant women is crucial during extraordinary situations. Furthermore, pregnant women may give birth prematurely due to the anxiety and worry experienced in extraordinary situations. Due to these reasons, it is reported that maternal deaths, which are still an important problem today, are 30% higher in crisis environments (4,8).

It is reported that there are an estimated more than 30 million women and girls of reproductive age living in environments where extraordinary situations occur, and all of them need access to SRH information and services (6,9). Following the extraordinary situations, women and girls in particular face serious SRH problems. Inadequate or interrupted access to SRH services increases the level of negative impact (10). In addition, in the environment where the extraordinary situation is experienced, disruption in the provision of services such as health, nutrition, shelter, and access to those services, as well as the decrease in necessary materials and logistics services, negatively affect SRH services (4). In terms of their impact on health, extraordinary situations, and their effects can create serious public health problems if, for example, disaster relief efforts and the provision of health services are negatively affected by the destruction of health institutions, damage to infrastructure, or interruptions in supply chains (3). In the delivery of health services, as always, nurses play a frontline role even in disaster situations. The student years are crucial for nurses to acquire knowledge and skills related to extraordinary situations and to raise awareness (11,12). This study aimed to determine the sexual and reproductive health knowledge level of nursing students in extraordinary situations and the affecting factors.

Research Questions

- What are the SRH knowledge levels of nursing students in extraordinary situations?
- What are the factors affecting nursing students' SRH knowledge levels in extraordinary situations?

2.Methods

2.1.Design

Descriptive and cross-sectional research was conducted between November and December 2023 with students registered at Bartın University, Faculty of Health Sciences, Department of Nursing.

2.2.Participants

The population of the research consisted of 431 students studying at Bartın University, Faculty of Health Sciences, Department of Nursing. The sample population was calculated with the known sampling method. The Sample Size Calculator program was used to calculate the sample size. For the calculation of the sample size based on the population in the program, with a confidence level of 95% (p=0.05), and

considering the population as 431, the sample size was determined to be at least 204 students. T The research was conducted with 356 students who met the inclusion criteria.

The inclusion criteria for the study were (1) Being an actively registered student in the Nursing Department of the Faculty of Health Sciences at Bartın University between November and December 2023, (2) Volunteering to participate in the research. The STROBE reporting checklist was followed in the study.

2.3.Data collection tools

The data were collected through a data collection form created through the Introductory Information Form and the Sexual and Reproductive Health Information Scale in Emergency Situations.

Introductory information form: This data form, prepared by the researchers in accordance with the literature, consists of 17 questions related to students' sociodemographic characteristics. These include age, gender, academic year, the longest place of residence, maternal education level, paternal education level, current place of residence, economic status, etc. (4,5,6,12).

Sexual and reproductive health knowledge scale in emergencies: Sexual and Reproductive Health Knowledge Scale in Emergencies (SRHKSE) was developed within by Cirban Ekrem and Kurt (2023) to assess the knowledge levels of nurses in sexual health and reproductive health during emergencies. The scale consists of 23 items and is of the five-point Likert type. Five items in the scale are reverse-coded (items 4, 8, 15, 18 and 23). The lowest possible score on the scale is 23, and the highest is 115. An increase in the obtained score indicates an increase in participants' knowledge of sexual and reproductive health related to extraordinary situations. The scale comprises four sub-factors, and a total score can be calculated. Cronbach's alpha value of the total scale was calculated as 0.896 (12). In this study, Cronbach's alpha value was calculated as 0.931.

2.4.Data collection

The data for the study were collected through a Introductory Information Form and the SRHKSE, both created by the researchers. The data collection form was shared with students during the educational process between November and December 2023, with permission obtained from the institution in the classroom setting. Students were requested to fill out the form at their convenience outside of class time and submit it to the researchers. The first page of the data collection form provided participants with information about the research. It was stated that by completing the data collection form, participants were confirming their participation in the study. The process of filling out the data collection form took approximately 10 minutes.

2.5.Statistical analysis

The statistical analyses of the study were conducted using the SPSS 26 software package. Descriptive statistics were utilized for the descriptive information of the participants. The normal distribution of the data was assessed using the Kolmogorov-Smirnov test. For variables demonstrating normal distribution, the Student's t-test was employed for comparisons between two groups, while the Oneway Anova Test was used for comparisons involving three or more groups. In cases where significant differences were found, the Bonferroni Test was used to identify the source of the differences. Pearson correlation analysis was utilized to determine the relationship between variables. A statistical significance level of $p<0.05$ was accepted.

2.6.Ethical approval

Ethical approval was obtained from the Bartın University Social and Human Sciences Ethics Committee to conduct the research (Protocol Number: 2023-SBB-0666, Meeting Date: 16.11.2023). Institutional permission was received from the institution where the research was conducted. Informed consent was obtained from all participants included in this study. Throughout the research process, adherence to the principles of the Helsinki Declaration and Publication Ethics was maintained.

3.Results

Table 1 displays the demographic characteristics of nursing students. The mean age of nursing students is 20.53±2.57, and 71.6% of them are female. Among nursing students, 29.8% are in the 2nd year, 62.1% have an income equal to their expenses, 47.2% have mothers with primary/middle school education, 37.1% have fathers with primary/middle school education, 77.2% have non-working mothers, 62.9% have working fathers, 33.1% reside in the city for the longest duration, 28.1% reside in the Karadeniz (Black Sea) region for the longest duration, 71.6% currently reside in dormitories, 80.6% do not smoke, 86.8% do not consume alcohol, 57.3% do not engage in physical exercise, and 71.1% do not have a romantic partner (Table 1).

Table 1. Demographic characteristics of nursing students (n=356)

Variables	$\bar{X}$**±SD**	
Age (year)	20.53±2.57	
	n	**%**
Gender		
Female	255	71.6
Male	101	28.4
Academic year		
Year 1	99	27.8
Year 2	106	29.8
Year 3	83	23.3
Year 4	68	19.1
Income status		
Income less than expenses	90	25.3
Income equal to expenses	221	62.1
Income greater than expenses	45	12.6
Mother's education level		
Literate	30	8.4
Primary/Middle School	168	47.2
High school	114	32.0
University and above	44	12.4
Father's education level		
Literate	14	3.9
Primary/Middle School	132	37.1
High school	127	35.7
University and above	83	23.3
Mother's working status		
Working	66	18.5
Not working	275	77.2
Retired	15	4.2
Father's employment status		
Working	224	62.9
Not working	38	10.7
Retired	94	26.4
Residence in the settlement unit where you have lived the longest		
Village/Town	52	14.6

District	99	27.8
City	118	33.1
Metropolitan Area	87	24.4
Geographic region of the settlement unit where you have lived the longest		
Aegean Region	16	4.5
Marmara Region	56	15.7
the Mediterranean region	29	8.1
Central Anatolia Region	85	23.9
Black Sea region	100	28.1
Southeastern Anatolia Region	46	12.9
Eastern Anatolia Region	24	6.7
Current place of residence		
At home with friends	46	12.9
At home with family and relatives	45	12.7
home alone	10	2.8
in dormitory	255	71.6
Smoking status		
Yes	69	19.4
No	287	80.6
Alcohol consumption status		
Yes	47	13.2
No	309	86.8
Physical exercise status		
Yes	152	42.7
No	204	57.3
Do you have a partner/lover?		
Yes	103	28.9
No	253	71.1

Note: $\bar{X}$: Mean, SD: Standard deviation, n: Number, %: Percent

Table 2 illustrates the SRH related characteristics of nursing students. It was observed that 59.2% of nursing students who have a partner/lover can discuss SRH; 83.4% have no prior sexual intimacy experience, and 82.6% are knowledgeable about SRH. Among those knowledgeable about SRH, 34.3% identified books/magazines/TV and family/teachers as their sources of information. Furthermore, 61.0% have not taken any courses on SRH, 58.4% believe that SRH services should be provided to university students at school, and 44.7% think that the quality of SRH services provided to university students should be easily accessible (Table 2).

Table 2. SRH related characteristics of nursing students (n=356)

Variables	n	%
If you have a partner/lover, ability to discuss SRH		
Yes	61	59.2
No	42	40.8
Previous experience of sexual intimacy		
Yes	59	16.6
No	297	83.4
Knowledge about SRH		
Yes	294	82.6
No	62	17.4
If you have knowledge about SRH source of information*		
Friend	89	25.0
Book/magazine/TV	122	34.3
Family/Teachers	122	34.3
Health personnel	73	20.5
Other	55	15.4
Taking courses on reproductive/sexual health		

Yes	139	39.0
No	217	61.0
Opinion on where SRH services should be provided to university students*		
In hospitals	102	28.7
In maternal and child health and family planning centers	82	23.0
At school	208	58.4
Only in independent counseling centers that provide education on reproductive/sexual health	62	17.4
In counseling centers at universities	106	29.8
Other	32	9.0
Opinion on the quality of SRH services provided to university students*		
Confidentiality should be maintained for applications and discussions	153	43.0
Should cover both counseling and treatment services	118	33.1
It should be provided in an easily accessible location	159	44.7
Both personal and group services should be available	138	38.8
Service times must be convenient for students.	118	33.1
Services should be provided by female experts for women and male experts for men	62	17.4
Other	20	5.6

Note: n: Number, %: Percent

** More than one option is marked.*

The relationship between nursing students' SRHKSE and their total and sub-dimension score averages is shown in Table 3. Nursing students' average score on SRHKSE total score is 84.90±7.91. The average scores for the sub-dimensions were as follows: Women's Health Empowerment 46.17±4.72, Material Supply for Implementing the Minimum Initial Service Package in Emergencies 17.79±2.42, Basic Knowledge of the Minimum Initial Service Package in Emergencies 10.07±1.27, and Strategy and Training for the Minimum Initial Service Package in Emergencies 10.87±1.72 (Table 3).

Table 3. The relationship between nursing students' SRHKSE and their total and sub-dimension score averages (n=356)

Variables	$\bar{X}$±SD
Women's Health Empowerment	46.17±4.72
Material Supply for Implementing the Minimum Initial Service Package in Extraordinary Situations	17.79±2.42
Minimum Initial Service Package Basic Information in Extraordinary Situations	10.07±1.27
Minimum Initial Service Package Strategy and Training in Extraordinary Situations	10.87±1.72
SRHKSE Total	84.90±7.91

Note: $\bar{X}$: Mean, SD: Standard deviation

The distribution of the total and sub-dimension mean scores of the SRHKSE according to the personal and SRH related characteristics of nursing students is showed in Table 4. When the gender of nursing students and the sub-dimension and total score averages of the scale were compared, it was found that the female students' sub-dimensions and total score averages of strengthening women's health and minimum initial service package strategy and training in extraordinary situations were higher compared to male nursing students, and the difference was statistically significant ($p< .05$). When the sub-dimension and total score averages of the scale were compared with the class levels of the nursing students, it was seen that the sub-dimensions and total score averages of the 3rd year students were higher than those of the 2nd year nursing students and the difference was statistically significant. Additionally, the 1st year students had higher scores in the Women's Health Empowerment subscale and total score compared to 2nd year nursing students and the difference was statistically significant. Moreover, the 4th year students had higher total scores compared to 2nd-grade nursing students, and the difference was statistically significant ($p< .05$). When the income status of nursing students was

compared with the subscale and total scores of the scale, it was found that students with income higher than expenses had higher scores in the Women's Health Empowerment and Extraordinary Situations Minimum Initial Service Package Strategy and Education subscales, as well as in the total score, compared to students with income equal to expenses. Moreover, students with income higher than expenses had higher scores in the Extraordinary Situations Minimum Initial Service Package Material Procurement subscale and total score compared to students with income less than expenses, and the difference was statistically significant (p< .05).When the mothers' educational levels of nursing students were compared with the subscale and total scores of the scale, it was found that students with mothers who graduated from primary school or middle school had higher scores in the Women's Health Empowerment subscale and total score compared to students with mothers who graduated from high school, and the difference was statistically significant (p< .05). When the nursing students' knowledge about SRH and the sub-dimension and total score averages of the scale were compared, the sub-dimensions and total score averages of the students who had knowledge about SRH were lower than the knowledge level of the sub-dimensions and total score averages of the Women's Health Empowerment and Extraordinary Situations Minimum Initial Service Package Strategy and Education subscales, as well as in the total score, compared to students without knowledge, and the difference was statistically significant (p< .05) (Table 4).

Table 4. The distribution of the total and sub-dimension mean scores of the SRHKSE according to the personal and SRH related characteristics of nursing students (n=356)

Variables	SRHKSE Total	Women's Health Empowerment	Material Supply for Implementing the Minimum Initial Service Package in Extraordinary Situations	Minimum Initial Service Package Basic Information in Extraordinary Situations	Minimum Initial Service Package Strategy and Training in Extraordinary Situations
	$\bar{X}$±SD	$\bar{X}$±SD	$\bar{X}$±SD	$\bar{X}$±SD	$\bar{X}$±SD
Gender					
Female	85.49±7.63[a]	46.55±4.46[a]	17.83±2.39	10.03±1.17	11.09±1.79[a]
Male	83.43±8.44[b]	45.22±5.21[b]	17.69±2.49	10.17±1.48	10.35±1.42[b]
Test / p value	2.232[t] / **.026 b<a**	2.424[t] / **.016 b<a**	.472[t] / .637	-.920[t] / .358	3.672[t] / **.000 b<a**
Academic year					
Year 1	85.77±7.46[a]	46.58±4.19[a]	18.03±2.17	10.13±1.37	11.03±1.63[a]
Year 2	82.79±8.80[b]	44.71±5.48[b]	17.43±2.56	10.17±1.23	10.48±1.74[b]
Year 3	86.14±8.11[c]	46.81±4.75[c]	18.04±2.49	10.10±1.27	11.20±1.67[c]
Year 4	85.43±6.16[d]	47.10±3.54[d]	17.69±2.43	9.79±1.15	10.84±1.82[d]
Test / p value	3.775[F] / **.000 b<a, b<c**	5.214[F] / **.002 b<a, b<c, b<d**	1.420[F] / .237	1.389[F] / .246	3.189[F] / **.024 b<c**
Income status					
Income less than expenses	84.17±8.70[a]	45.96±5.23[a]	17.49±2.48[a]	9.84±1.36	10.88±1.90[a]
Income equal to expenses	84.52±7.88[b]	45.91±4.72[b]	17.75±2.42[b]	10.11±1.18	10.74±1.65[b]
Income greater than expenses	88.29±5.30[c]	47.89±3.07[c]	18.58±2.18[c]	10.33±1.43	11.49±1.62[c]
Test / p value	4.879[F] / **.008 a<c, b<c**	3.455[F] / **.033 b<c**	3.150[F] / **.044 a<c**	2.525[F] / .082	3.556[F] / **.030 b<c**
Mother's education level					

Literate	83.50±6.32[a]	45.90±3.78[a]	17.30±2.07	9.80±1.24	10.50±1.33[a]
Primary/Middle School	86.17±6.89[b]	46.90±4.15[b]	17.97±2.39	10.13±1.29	11.16±1.67[b]
High school	83.67±9.35[c]	45.25±5.38[c]	17.74±2.45	10.04±1.37	10.63±1.82[c]
University and above	84.25±7.96[d]	45.95±5.18[d]	17.57±2.68	10.09±0.88	10.64±1.81[d]
Test / p value	2.813[F] / **.039** **c<b**	2.901[F] / **.035** **c<b**	.862[F] / .461	.603[F] / .614	3.100[F] / **.027**
Taking courses on SRH					
Yes	85.37±7.45[a]	46.44±4.38[a]	17.81±2.42	10.10±1.25	11.03±1.69[a]
No	82.69±9.58[b]	44.92±5.94[b]	17.71±2.42	9.95±1.35	10.11±1.70[b]
Test / p value	2.438[t] / **.015** **b<a**	2.320[t] / **.021** **b<a**	.285[t] / .776	.811[t] / .418	3.882[t] / **.000** **b<a**

Note: $\bar{X}$: Mean, SD: Standard deviation, n: Number, %: Percent, F: One-way Anova Test

4.Discussion

One of the most significant factors that negatively affects the future and well-being of university students is risky behavior related to SRH. Taking initiatives to prevent risky behaviors related to SRH, coupled with an increase in knowledge on the subject, serve as a protective factor against adverse outcomes (13,14). SRH goes beyond knowledge and behavior and reflects the motivation and competence to access SRH-related information, understand, evaluate, and apply the acquired information to manage the problems experienced in SRH (15,16). As the quality and accessibility of SRH information directly affect university students' capacity to access, understand, evaluate, and apply SRH information to maintain their SRH, SRH may be negatively affected, especially in adverse extraordinary situations encountered in an ever-changing world (6,17). Negative impact status varies depending on SRH knowledge levels and many variables.

The majority of nursing students in the study could discuss SRH if they had a partner/lover, had no previous experience of sexual intimacy, were knowledgeable about SRH, had not taken a course on SRH, believed that SRH services should be provided to university students, and expressed the opinion that the quality of SRH services for university students should be easily accessible. In a study conducted by Seid et al. (2022), it was found that 73.1% of nursing students had not received sexual health education, and 46.3% discussed sexuality with their friends (18). The majority of nursing students in the study could discuss SRH if they had a partner/lover, had no previous experience of sexual intimacy, were knowledgeable about SRH, had not taken a course on SRH, believed that SRH services should be provided to university students, and expressed the opinion that the quality of SRH services for university students should be easily accessible. In a study conducted by Seid et al. (2022), it was found that 73.1% of nursing students had not received sexual health education, and 46.3% discussed sexuality with their friends (18). In the study by Senturk Erenel and Cicek Ozdemir (2020), it was revealed that 95% of nursing students knew about sexual health, 50% believed that the existing information about sexual health was partially sufficient, and 74.8% of those with knowledge considered school courses (related to sexuality and sexual health) as a source of information (19). Koçoğlu et al.'s (2022) study reported that 93.2% of nursing students had knowledge about SRH. Among those with knowledge, 53.8% obtained information from family/teachers, 61.2% believed that SRH services should be provided to university students at school, 69.1% expressed the need to provide SRH services to youth while maintaining confidentiality about applications and discussed topics and 86.4% stated that SRH services should be provided by a well-equipped healthcare professional (20). In the study conducted by Karakurt and Köse Tuncer (2022), it was found that 66.2% of university students did not receive sexual health education, and among those who did, 91.2% obtained information through the internet (21). In the study conducted by Dışsiz et al., 83.9% of nursing students were able to share their SRH problems,

90.5% did not have sexual intimacy before marriage, 68.7% did not receive information about SRH health, and It was determined that 97.4% of them thought that SRH education should be provided in schools (22). In the study by Üstgörül et al. (2020) examining the gender perceptions and sexual attitudes of university students, 55.4% of them had received information about sexuality before, 70.7% believed that sexual health education should be given by a specialist physician, 66.9% of them thought that sexual health education should be given by a specialist physician (23). It was determined that most of the students wanted the sexual health course to be mandatory. While most studies conducted in our country reported that university students did not have access to sufficient information about sexuality, this study concluded that the students had sufficient information. The difference is thought to be influenced by the existence of a course on SRH at the university where the study was conducted.

The impact of mass disasters on sexual function has always been a subject of debate. Concerns arise regarding the behavioral anxiety, feelings of fear, and even panic caused by extraordinary situations such as mass health problems like pandemics and natural disasters (earthquakes, floods, etc.), as well as the measures taken to control these extraordinary situations, leading to adaptation disorders and the onset or exacerbation of depression (24). It has been determined that SRH training given to nurses and midwives in emergency situations in Turkey increases the level of knowledge (25). Except this, it is predicted that these will have effects on sexual function and satisfaction, and it is thought that the problems that may be experienced can be alleviated with an increase in the level of knowledge about SRH. In Turkey, the level of knowledge regarding SRH in extraordinary situations that are difficult to predict and manage, such as the COVID-19 pandemic, earthquake, and flood has not been investigated before. In this study, it was determined that nursing students have high levels of knowledge about SRH in extraordinary situations, including women's health empowerment, providing material supply for the minimum initial service package in emergencies, basic knowledge of the minimum initial service package in emergencies, and strategies and education related to the minimum initial service package in emergencies. There is no existing study in the national and international literature that specifically examines the knowledge level of SRH in extraordinary situations. Therefore, the findings of this study are considered original and contribute to the literature by providing support in this aspect.

This study reveals that knowledge levels about SRH in extraordinary situations are influenced by gender, class, income level, maternal education, and the status of being informed about SRH. In a study by Koçoğlu et al. (2022), it was found that individuals with knowledge about SRH had more favorable attitudes toward reproductive health compared to those without knowledge (20). In another study by Üstgörül et al. (2020), as well as in the research conducted by Evcili and Golbasi (2017), it was reported that university students aged 22 and older, living in urban areas, with mothers having education levels of middle school or higher, and having employed mothers, exhibited higher levels of sexual health knowledge (23,26). Upon reviewing the literature, no study specifically investigating the factors affecting the knowledge level of SRH in extraordinary situations was found. There are only a few studies that have examined the factors influencing sexual health knowledge. The findings of this study contribute to the literature by presenting a different perspective and providing support to existing knowledge.

5.Conclusions and Recommendations

In the study, nursing students' knowledge levels of SRH in extraordinary situations are high, and their knowledge levels are influenced by gender, class, income level, maternal education, and the status of being informed about SRH.

In light of these results, it is recommended that nurses and educators specializing in women's health provide nursing students with SRH education tailored for extraordinary situations. Additionally, incorporating courses related to sexual health into the curriculum as mandatory subjects, organizing health education sessions for healthcare professionals on SRH during extraordinary situations, creating standardized content through the development of guidelines and consensuses for SRH in extraordinary situations, and integrating them into health policies are suggested. It is recommended that researchers conduct further studies with a high level of evidence on this subject.

Limitations

It is thought that this study offers a crucial evidence explaining the level of knowledge about SRH of nursing students in extraordinary situations and the influencing factors for our country. The limited number of studies conducted on SRH in extraordinary situations in our country and the published studies related to the SRHKSE have restricted the discussion section.

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