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Research Article

Coronavirus Phobia and Burnout in Healthcare Workers During the Pandemic Process

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Abstract

Aim: During the pandemic process, healthcare workers are in a very high-risk group and constitute the group most affected by the process. This study was conducted to determine coronavirus phobia and burnout in healthcare workers during the pandemic process.

Method: This descriptive study was conducted with 337 healthcare workers between June and December 2021. Research data were collected using the Descriptive Characteristics Form, the Coronavirus 19 Phobia Scale, and the Coronavirus Burnout Scale.

Results: The mean age of participants in the study was 31.7±8.5; 69.97% of them were female, and 45.7% of them were nurses. The mean score of the Coronavirus Phobia Scale of the healthcare professionals was 49.46±15.83, and the mean score of the Coronavirus Burnout Scale was determined as 25.65±10.50. It was concluded that there was a statistically significant positive correlation between the Coronavirus Phobia Scale of healthcare workers and the Coronavirus Burnout Scale ($p<0.05$). It was determined that coronavirus phobia and burnout were higher in women and in those who worked in the intensive care unit. Coronavirus phobia was higher in healthcare workers who had chronic diseases and whose family members were not diagnosed with COVID-19 ($p<0.05$). In addition, it was determined that coronavirus phobia and burnout were higher in nurses in doctors ($p<0.05$).

Conclusion: It was concluded that the coronavirus phobia and burnout levels of healthcare workers were low, and the burnout increased as the phobia level increased.

Keywords: Coronavirus, Phobia, Burnout, Healthcare worker

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1. Introduction

It is a well-known fact that the epidemic process that the whole world is going through has psychological as well as physical effects on individuals. Healthcare workers are undoubtedly the most affected by this situation (1). Since the beginning of the H1N1 pandemic, healthcare workers have been under heavy workloads. Limited resources, long shifts, disruption of sleep and work-life balance, and occupational hazards associated with exposure to COVID-19 patients lead to many post-traumatic psychological problems such as stress, insomnia, anxiety, and depression in healthcare workers (2). According to data from a study conducted with healthcare workers, depression was found in 95% of the participants, and 35% of these individuals were found to have severe depression. In the same study, 60% of participants were reported to have extremely severe anxiety (3). In addition to anxiety and depression, another psychological problem experienced by healthcare workers is fear. Fear is a defense mechanism. It can be adapted to the environment and increase the chance of survival (4). The results of studies on the fear caused by the coronavirus, which has recently entered our lives, on individuals have begun to take their place in the literature. In fact, in a study conducted with healthcare workers, it was found that the participants' COVID-19 anxiety levels were above average and that male participants had higher anxiety

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levels than females (3). In a similar study conducted with healthcare workers in our country, it was found that women's fear of COVID-19 was higher than men's (5). Fear can be defined as a defense mechanism, but its excessive presence leads to individual mental health problems such as phobia (4). A phobia is defined by the Turkish Language Association as "an unusually strong fear of certain objects or situations, anxiety" (6). In addition, phobia is also expressed as a pathological fear that cannot be controlled and causes panic. Therefore, in phobias, life is organized around fear, and quality of life is negatively affected (7). Certain phobias may arise due to structural, genetic, and physiological characteristics, as well as the influence of environmental conditions. In this sense, the COVID-19 pandemic may be an environmental trigger of phobic conditions. People may develop disproportionate reactions to objects or situations that they associate with the COVID-19 pandemic, and as a result, a coronavirus phobia may develop (8). It can be seen that current studies generally question the fear of coronavirus. However, considering the changes and effects it causes in lives, it is believed that the fear of coronavirus has begun to reach pathological dimensions. All of these effects can lead to burnout in healthcare workers (5). In a study conducted with healthcare workers, 52.8% of the participants experienced burnout (9). In another study of healthcare workers, this rate was found to be 75% (10). The COVID-19 process has highlighted the importance of the healthcare system for societies and healthcare professionals. Undoubtedly, the usefulness of healthcare workers is related to their physical and mental health (11). Determining the psychological problems experienced by healthcare workers during the COVID-19 process will prepare the ground for effective psychological support practices and institutional policies that can be made in this regard. Therefore, this study was designed to determine coronavirus phobia and burnout in healthcare workers.

2. Methods

The study was conducted in a training and research hospital in Turkey between 15.7.2021 and 15.12.2021. The population of the study consisted of 900 employees working in the hospital on the specified dates. The study aimed to reach the entire population, so no sample selection was made. After explaining the purpose of the study to the individuals based on voluntary participation in the study, 337 healthcare workers who were over 18 years of age, who could read and write, who were not on vacation on the dates of the study, who did not have hearing/visual disabilities, and who agreed to participate in the study were included in the study. The data collection form was administered through face-to-face interviews. At the end of the study, a sample calculation was performed using the OpenEpi version 3 program. The sample size was determined to be 310, with a margin of error of 5% and a power interval of 97%.

3. Data Collection Forms

3.1. Descriptive characteristics form

This section includes a total of 16 questions, such as age, gender, occupation, type of employment, COVID-19 vaccination status, COVID-19 infection status, and COVID-19 infection status of a family member.

COVID-19 phobia scale (C19P-S): It was developed by Arpacı et al. The aim of this scale, which is a 5-point Likert-type self-rating scale, is to measure coronavirus phobia. It is rated between 1 "strongly disagree" and 5 "strongly agree." The scale consists of psychological (items 1, 5, 9, 13, 17, 20), somatic (items 2, 6, 10, 14, and 18), social (items 3, 7, 11, 15, and 19) and economic (items 4, 8, 12, and 16) subscales. The subscale scores are obtained by summing the responses to the subscale items, and the total scale score is obtained by summing all the subscale scores. The total score ranges from 20-100. An increase in the score indicates an increase in the sub-dimensions and general coronavirus phobia. The Cronbach's alpha value of the scale was found to be 0.92 (8). In our study, this value was found to be 0.94.

Covıd-19 burnout scale: The validity and reliability of the scale conducted by Yıldırım and Solmaz has a 5-point Likert scale. The scale items are rated as Never = 1, Rarely = 2, Sometimes = 3, Often = 4, and Always = 5. The scale is unidimensional, and the total score is obtained by summing up all responses. The total score ranges from 10 to 50. A higher total score indicates a higher level of burnout. The Cronbach alpha value of the scale is 0.92 (12). This value was found to be 0.94 in our study.

3.2. Data analysis

Data were analyzed using SPSS Statistics for Windows 25.0. Numbers, percentages, and means were used to evaluate the data. An independent sample t-test was used to compare two independent groups, and F test was used to compare more than two groups. The Bonferroni multiple comparison test was used to identify groups with differences. A value of $p<0.05$ was accepted as the level of statistical significance.

3.3. Ethical aspect of the study

Approval was obtained from Bilecik Şeyh Edebali University Ethics Committee for the research to be carried out (18/06/2021-27325).Written institutional permission was obtained from Health Ministry and the hospital where the study was conducted (E-41652334-604.02-2021/15). In addition, the necessary permissions were obtained from the health professionals participating in the study too.

4. Results

The mean age of the participants was 31.7± 8.5 years 69.7% were female, and 45.7% were nurses. 14.5% of the workers had a chronic disease, 26.4% had been diagnosed with COVID-19, and 86.6% had received the COVID-19 vaccine. In addition, 19.9% of the healthcare workers participating in the study worked in the COVID-19 clinic, and 17.5% worked in the intensive care unit during the pandemic (Table 1).

Table 1. Sociodemographic Characteristics of Participants (n=337)

Sociodemographic Characteristics		**Number**	**Percentage**
Age (Mean±SD =31.7± 8.5)	18-30	168	49.9
	30-60	169	50.1
Gender	Female	235	69.7
	Male	102	30.3
Profession	Nurse	154	45.7
	Physician	50	14.8
	Patient care staff	79	23.4
	Cleaning staff	27	8.0
	Health Technician	27	8.0
Marital status	Married	169	50.1
	Single	168	49.9
Has children	Yes (Mean±SD)=1,69±0,73	175	51.9
	No	162	48.1
Chronic disease	Yes	49	14.5
	No	288	85.5
The unit worked before the pandemic	Intensive care	51	15.1
	Emergency service	44	13.1
	Polyclinic	166	49.3
	Inpatient care	76	22.6

The unit worked in the pandemic	Intensive care	59	17.5
	COVID-19 service	67	19.9
	Emergency service	35	10.4
	Polyclinic	94	27.9
	Non-COVID-19 services	82	24.3
Operating hours	Day shift	131	38.9
	Night shift	6	1.8
	Rotating shifts	200	59.3
Are there any people over 65 years of age or with a high-risk disease in your family or among the people you live with?	Yes	135	40.1
	No	202	59.9
Have you been diagnosed with COVID-19?	Yes	89	26.4
	No	248	73.6
If you have been diagnosed with COVID-19, have you had to be hospitalized for further examination and treatment?	Yes	13	3.9
	No	324	96.1
Have you been vaccinated against COVID-19?	Yes	292	86.6
	No	45	13.4
Has anyone in your family been diagnosed with COVID-19?	Yes	132	39.2
	No	205	60.8
If someone in your family was diagnosed with COVID-19, did they have to be hospitalized for further examination and treatment?	Yes	31	9.2
	No	306	90.8
Have you experienced the loss of family, friends, etc. due to COVID-19?	Yes	82	24.3
	No	255	75.7

Mean±SD: Mean ±Standard Deviation

The mean score of the C19P-S scale was 49.46±15.83, and the mean score of the COVID-19 Burnout Scale was 25.65±10.50 (Table 2).

Table 2. Coronavirus Phobia and Burnout Levels of Participants

	Minimum	**Maximum**	**Mean**	**Std. Deviation**
COVID-19 Phobia Scale	20.00	100.00	49.46	15.83
Psychological Sub-dimension	6.00	30.00	17.91	5.69
Somatic Sub-dimension	5.00	25.00	10.01	4.27
Social Sub-dimension	5.00	25.00	13.27	4.83
Economic Sub-dimension	4.00	20.00	8.28	3.53
COVID-19 Burnout Scale	10.00	50.00	25.65	10.50

It was found that there was a statistically significant positive and moderate relationship between the C19P-S scale and the Coronavirus Burnout Scale (r=0.642; p=0.000). It was also concluded that there was a statistically significant positive and moderate relationship between the psychological, somatic, social, and economic sub-dimensions of the C19P-S scale and the COVID-19 Burnout Scale (r=0.607; p=0.000, r=0.531; p=0.000, r=0.601; p=0.000, r=0.437; p=0.000) (Table 3).

Table 3. The Relationship Between Coronavirus Phobia and Burnout Levels of Participants

Scale		**COVID-19 Burnout Scale**
COVID-19 Phobia Scale	r	0.642**
	p	0.000
Psychological Sub-dimension	r	0.607**
	p	0.000
Somatic Sub-dimension	r	0.531**
	p	0.000
Social Sub-dimension	r	0.601**
	p	0.000
Economic Sub-dimension	r	0.437**
	p	0.000

**p<0.01

Table 4. Coronavirus Phobia and Burnout Levels of Participants Based on Some Descriptive Characteristics (n=337)

Some descriptive characteristics	**CP19-S** Mean±SD(med) (Min-Max)	*Psychological Sub-dimension* Mean±SD(med) (Min-Max)	*Somatic Sub-dimension* Mean±SD(med) (Min-Max)	*Social Sub-dimension* Mean±SD(med) (Min-Max)	*Economic Sub-dimension* Mean±SD(med) (Min-Max)	**COVID-19 Burnout Scale** Mean±SD(med) (Min-Max)
Gender						
Female	51.94±15.21 (51)(20-100)	18.94±5.35(19) (6-30)	10.47±4.38(10)(5-25)	13.94±4.69(14) (5-25)	8.6±3.57(8) (4-20)	27.11±10.33 (26)(10-50)
Male	43.73±15.82 (43)(20-100)	15.54±5.76(15) (6-30)	8.93±3.82(8) (5-25)	11.73±4.83(11) (5-25)	7.53±3.33(8) (4-20)	22.28±10.15 (21.5)(10-50)
t test	**4.502**	**5.230**	**3.082**	**3.941**	**2.582**	**3.961**
p value	**0.000**	**0.000**	**0.002**	**0.000**	**0.010**	**0.000**
Profession						
Nurse (1)	52.35±15.15 (51)(20-100)	18.84±5.35(19) (6-30)	10.64±4.25(10)(5-25)	13.99±4.61(14) (5-25)	8.88±3.48(8) (4-20)	27.37±10.37 (27.5)(10-50)
Physician (2)	39.36±12.03 (40)(20-65)	14.1±4.49(13) (6-26)	8.26±3.15(7) (5-16)	10.5±3.42(10) (5-18)	6.5±2.76(6) (4-15)	23.28±8.2(24) (10-49)
Patient care staff (3)	50.78±14.23 (50)(20-81)	18.9±5.58(19) (6-30)	9.87±3.84(10) (5-21)	13.9±4.97(13) (5-25)	8.11±3.15(8) (4-16)	24.29±9.74(23) (10-50)
Cleaning staff (4)	50.85±22.36 (50)(23-100)	17.52±6.8(18) (7-30)	11.19±6.31(9) (5-25)	13.44±5.83(14) (5-25)	8.7±4.96(8) (4-20)	23.3±13.88(18) (10-50)
Health Technician (5)	46.37±15.67 (43)(20-75)	17.15±5.97(17) (6-27)	8.81±3.88(9) (5-20)	12.26±5.15(11) (5-23)	8.15±3.47(8) (4-18)	26.56±12.11 (26) (10-47)
F test	**10.170**	**7.994**	**5.153**	**9.036**	**6.098**	**2.632**
p value	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.040**
Post-hoc	2<1,3,4	2<1,3	2<1,4	2<1,3	2<1	2<1
Chronic disease						
Yes	54.98±15.48(54) (20-94)	19.24±5.42(19)(6-30)	11.27±4.32(10)(5-23)	14.92±4.61(14)(5-25)	9.55±3.7(9) (4-19)	27.37±10.98 (27) (10-50)
No	48.52±15.73(48) (20-100)	17.68±5.71(18) (6-30)	9.79±4.23(10) (5-25)	12.99±4.82(12.5) (5-25)	8.06±3.46(8) (4-20)	25.36±10.41 (24) (10-50)
t test	**2.665**	1.785	**2.247**	**2.610**	**2.764**	1.240
p value	**0.008**	0.075	**0.025**	**0.009**	**0.006**	0.216
Unit worked in the pandemic						
Intensive care (1)	54.15±16.32 (51) (24-100)	20.15±4.94(19) (10-30)	10.36±4.78(10)(5-25)	14.51±4.87(14) (5-25)	9.14±3.87(8) (4-20)	30.76±11.44 (29) (10-50)

COVID-19 service (2)	49.73±14.78 (52) (20-77)	18.03±5.85(19) (6-30)	10.25±3.66(10)(5-20)	13.61±4.83(14) (5-25)	7.84±3.56(8) (4-18)	26.22±10.59 (25) (10-50)
Emergency service (3)	41.29±14.81 (40) (20-79)	15.34±5.64(15) (6-27)	8.31±3.98(7) (5-20)	10.69±4.3(10) (5-21)	6.94±2.75(7) (4-14)	23.57±9.87(24) (10-47)
Polyclinic (4)	51.05±15.97 (49) (21-100)	18.29±5.74(18) (7-30)	10.46±4.51(10)(5-25)	13.55±4.78(12.5) (5-25)	8.76±3.61(8) (4-20)	23.82±9.12 (22.5) (10-45)
Non-COVID-19 services (5)	47.51±15.32 (46) (20-80)	16.85±5.46(17) (6-30)	9.76±4.08(10) (5-21)	12.87±4.74(13) (5-25)	8.04±3.26(8) (4-16)	24.49±10.45 (23.5)(10-48)
F test	**4.347**	**5.132**	1.882	**3.911**	**2.985**	**5.094**
p-value	**0.002**	**0.001**	0.113	**0.004**	**0.019**	**0.001**
Post-hoc	3<1,4	1>3,5		3<1,2,4	3<1,4	1>3,4,5
Has anyone in your family been diagnosed with COVID-19?						
Yes	47.11±16.12 (46)(20-100)	16.83±5.75(16)(6-30)	9.81±4.35(10) (5-25)	12.33±4.67(12)(5-25)	8.14±3.6(8) (4-20)	24.95±10.16 (24)(10-50)
No	50.97±15.5(50)(20-100)	18.6±5.55(19) (6-30)	10.13±4.22(10)(5-25)	13.87±4.85(14)(5-25)	8.36±3.49(8) (4-20)	26.1±10.71(25) (10-50)
t-test	**-2.192**	**-2.811**	-0.673	**-2.901**	-0.551	-0.986
p-value	**0.029**	**0.005**	0.501	**0.004**	0.582	0.325

Mean±SD: Mean±Standard Deviation

When the levels of coronavirus phobia and burnout of the participants were examined according to some descriptive characteristics of the participants, it was determined that the scores obtained from the C19P-S, psychological, somatic, social, economic sub-dimensions, and the COVID-19 Burnout Scale showed a statistically significant difference according to the gender of the participants ($p<0.05$) and the scores of women were higher. It was concluded that the scores obtained from the C19P-S scale, psychological, somatic, social, and economic sub-dimensions, and the COVID-19 Burnout Scale showed a statistically significant difference according to the occupation of the participants ($p<0.05$). According to the multiple comparison tests performed to determine the groups showing differences, it was determined that the general and sub-dimensions of phobia scores of nurses were higher than those of physicians. It was determined that the scores obtained from the C19P-S scale, somatic, social, and economic sub-dimensions showed a statistically significant difference according to the presence of chronic disease of the participants ($p<0.05$), and the scores of individuals with chronic disease were higher. However, it was concluded that the participants' scores on the burnout scale did not show a statistically significant difference according to the presence of chronic disease ($p>0.05$). It was found that the participants' scores on the C19P-S scale, psychological, social, economic sub-dimensions, and COVID-19 burnout scale showed a statistically significant difference according to the unit in which they worked during the pandemic process ($p<0.05$). According to the multiple comparison tests performed to determine the groups showing differences, it was found that the total score of the C19P-S scale was higher among intensive care and outpatient clinic staff than among emergency department staff. In the psychological sub-dimension, it was determined that the score of those working in the intensive care unit was higher than that of those working in the emergency department and units other than COVID. In the social and economic sub-dimensions, it was found that the scores of those working in the emergency department were lower than those working in intensive care and outpatient clinics. The COVID-19 Burnout Scale score was higher for those working in the ICU than for those working in the ED, outpatient clinics, and outside the COVID-19 clinic. It was found that the scores obtained from the C19P-S scale, psychological and social sub-dimensions showed a statistically significant difference ($p<0.05$) according to the presence of someone diagnosed with COVID-19 in the family of the participants ($p<0.05$), and the scores of people who did not have a COVID-19 diagnosis in their family were higher.

5. Discussion

It is clear that healthcare workers are at very high risk during the pandemic process and are one of the most affected groups. In addition to the physiological effects of the process on healthcare workers, the psychological effects are also considerable (13). Therefore, the psychological impact of the pandemic on healthcare workers has been addressed in many studies (14). This study investigated the coronavirus phobia and burnout levels of healthcare workers during the pandemic. Considering the highest and lowest scores attainable from the coronavirus phobia and burnout levels scales, the coronavirus phobia and burnout levels of healthcare workers are low. In a study conducted by Oktay Arslan et al. (2021), it was observed that healthcare workers had a moderate level of coronavirus phobia (15). The fear of coronavirus was also found to be at a moderate level in a study conducted among nurses (14). In a study done by Hu et al. (2020), the level of burnout among nurses was found to be moderate (16), while in another study conducted among physicians, physicians were found to have high levels of burnout symptoms (17). When the results of similar studies in the literature were examined, the levels of burnout and fear of COVID-19 varied (14-17). These differences may be due to many factors, such as the characteristics of the group studied, the intensity of the institution, and whether there is a lack of personal protective equipment. In fact, many healthcare workers were infected at the beginning of the COVID-19 pandemic due to the global problems experienced in this regard (18). It is also thought that this may be related to the time interval where the research was conducted. Because the COVID-19 vaccination program started in 2021, it can be assumed that vaccination changes the impact of the pandemic on the psychology of healthcare workers by eliminating uncertainty in the early stages of the pandemic. Our study showed that the fear of COVID-19 and burnout were found to be higher in women. The study conducted by Çayır Yılmaz and Uysal showed that the level of fear of COVID-19 was found to be significantly higher in women. Similarly, in the study conducted by Arpacıoğlu et al. (2021), the fear of COVID-19 and burnout were found to be significantly higher in women. It can be seen that the results of our study are similar to the studies in the literature.

In our study, burnout was found to increase as coronavirus phobia increased. In a similar study conducted by Yakut et al. (2020) among healthcare workers, it was found that burnout increased as fear of COVID-19 increased (19). In another study conducted by Çalışkan and Kargın (2022) with healthcare workers, it was concluded that there was a significant relationship between fear of COVID-19 and burnout (20). It can be seen that the result obtained in our study is similar to the literature. It can be assumed that healthcare workers are in direct contact with patients as a high-risk group in the COVID-19 process, and the increased workload in this process is effective in the fear and burnout of employees. In our study, the COVID-19 phobia score of nurses was found to be higher than that of physicians. In a study investigating the health risk factors of physicians and nurses during the pandemic period, nurses were found to be more stressed and anxious than physicians (21). In a study conducted by Karadem et al. (2021) among healthcare professionals, it was concluded that nurses' fear of COVID-19 was higher than that of physicians (22). Our study is similar to the literature. Due to the nature of their profession, nurses spend more time with patients and have closer contact with patients than other healthcare professionals. Therefore, their level of anxiety may be higher.

At the same time, our study found that coronavirus phobia was higher among those working in intensive care units and outpatient clinics than among those working in the emergency department. Intensive care units are units where there is close contact with patients, and many interventions are performed that may increase the risk of infection with COVID-19, such as airway aspiration and intubation. Therefore, it is normal that individuals working in intensive care units were found to have high coronavirus phobia in our study. In outpatient clinics, it is thought that coronavirus phobia among staff may be high because of problems such as maintaining social distancing and providing adequate ventilation in waiting areas. The reason for the low coronavirus phobia among emergency room staff, where the risk of infection with COVID-19 may be high, might be due to the establishment of a triage

area outside the emergency room at the facility where the study was conducted and allowing individuals to enter this area after certain screenings.

In our study, burnout was found to be higher in ICU workers compared to those working in other units. In a similar study conducted in our country during the pandemic, investigating burnout in physicians and nurses in a university hospital, emotional exhaustion was found to be higher in ICU workers (23). A similar result was found in a study conducted by Alnazly et al. (2021) in Jordan (3). In another study conducted in our country, burnout was found to be higher in the group in contact with COVID-19 patients (24). As the COVID-19 pandemic spread, the workload of intensive care units increased (25). It can be said that the higher burnout of ICU staff compared to other units is a result of this situation.

Fear of transmitting the infection to loved ones and separation from family members are some of the challenges faced by healthcare workers during the pandemic process (15). The psychological impact of this fear experienced by healthcare workers has been highlighted in many studies (16,26,27). Sakaoğlu et al. (2020) also stated that the most challenging factor for healthcare workers was the risk of infecting their children and other family members (28). In fact, in our study, it was concluded that the general, sociological, and psychological subdimension scores of coronavirus phobia were higher in healthcare workers whose family members were not diagnosed with COVID-19. The lower scores of those diagnosed with COVID-19 may have been because they were confronted with the disease.

6. Conclusions and Recommendations

Results showed that coronavirus phobia and burnout were low among healthcare workers, and burnout increased as phobia levels increased. It was found that coronavirus phobia and burnout were higher in women, and coronavirus phobia and burnout were higher in healthcare workers with chronic diseases, whose family members had not been diagnosed with COVID-19, and who worked in intensive care. It was also found that coronavirus phobia and burnout were higher in nurses than in physicians. The pandemic negatively impacted the mental and physical health of healthcare workers. Based on these results, institutional and national plans should be made to strengthen the mental health of healthcare workers. The motivation of workers can be increased through material and moral arrangements to be made within these plans. In addition, health workers can undergo mental health screening at certain intervals. The psychological effects of staff working in high-risk areas, such as intensive care units, can be monitored, and therapeutic programs prepared for them. Healthcare workers subjected to quarantine or isolation can be given access to psychological support during or after quarantine or isolation. In addition, this study was conducted in a teaching and research hospital. Since there may be differences in working conditions, it may be recommended to conduct the study with a larger sample group, including university and private hospitals.

Limitations

This study had some limitations. First, the research was conducted in a single center and within a specific time period. And second the survey responses are based on participant reporting.

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Research Article

The Relationship Between Proactive Personality Traits and Professional Values in Final-Year Nursing Students

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Abstract

Aim: This descriptive, relational study investigated the relationship between final-year nursing students' proactive personality traits and professional values.

Method: The research population consisted of 101 final-year nursing students in the nursing department of a university in eastern Turkey between 10-20 December 2022. The study data were collected online using the participant introduction form, the Abbreviated Proactive Personality Scale and the Professional Nursing Values Scale and analyzed using descriptive statistics, independent groups t-test, Kruskal-Wallis and Pearson correlation test.

Results: The final-year nursing students were found to have an average of 49.53±10.34 and 112.34±15.87 on the Abbreviated Proactive Personality Scale and Professional Nursing Values Scale, respectively, and had a proactive personality and high professional values above the medium level. The study showed that the final-year nursing students who volunteered to become nurses had higher mean scores on the Professional Nursing Values Scale total score and the Professionalism, Activism and Justice subscales, with a statistically significant difference. A moderately significant positive correlation was found between students' Abbreviated Proactive Personality Scale and Professional Nursing Values Scale mean scores ($r=0.477$, $p<0.001$). The research found that as students' proactive personality increased, so did their professional values.

Conclusion: The study found that students had proactive personalities and high professional values above the moderate level, and as proactive personality traits increased, their professional values also increased. In this regard, developing students' proactive personality traits and professional nursing values may be recommended, as increasing their awareness and conducting research with larger groups.

Keywords: Final year nursing students, Proactive personality, Nursing, Professional nursing values

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1. Introduction

Proactive personality is the inclination to take personal actions to influence one's environment (1). Individuals with a stronger proactive personality are more emotionally stable, better equipped to cope with stress and seek opportunities to improve their performance (1,3). Several studies have shown that proactive personality positively impacts various career variables, including career decision-making processes (4) and career adaptability (5) in university students. Proactive personality is positively associated with learning motivation (6) and academic self-efficacy (7). Individuals with proactive personalities are aware of their responsibilities and strive to create positive changes in all environments. These characteristics enable them to achieve their goals more efficiently and persist in their efforts (8,9). Proactive personality behaviours play a crucial role in various professions, including nursing.

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Nursing aims to solve existing health problems and improve quality of life. Nurses can offer high-quality care by respecting their patients' lives, individuality, integrity, values, decisions, and honour. Nurses must know the personal and professional values that shape their behaviour (10,11). Professional values are the standards of action accepted by practitioners and the professional group, providing a framework for evaluating beliefs and attitudes that affect behaviour (12). The acquisition of nursing professional values is central to professional development. Professional behaviours expand the roles and responsibilities of nurses, enabling positive changes in the people they care for and increasing the quality of care (13,14).

Nursing students must integrate their values and characteristics with their professional values while adapting to their professional roles throughout their education. A study conducted with final-year nursing students found that those with high proactive personality traits had better communication skills and used various approaches to solve conflicts (15). Nursing students must possess a proactive personality to manage their knowledge and skills rationally. The literature reveals limited studies examining proactivity in nurses and student nurses (15,18). However, studies have not explored the relationship between proactive personality traits and professional values in final-year nursing students. Examining and developing nursing students' proactive personalities and professional values can contribute to nursing. This study investigates the relationship between proactive personality traits and professional values among final-year nursing students.

2. Methods

2.1. Study design

The study employed a descriptive-correlational design to investigate the relationship between proactive personality traits and professional values among final-year nursing students.

Dependent variables: Proactive personality traits and professional values of final-year nursing students.

Independent variables: Age, gender, place of residence, school expectations and expectations from the nursing profession.

This study sought answers to the following questions:

- What is the level of proactive personality traits of final-year nursing students?
- What is the level of professional values of final-year nursing students?
- What is the relationship between proactive personality traits and professional values of final-year nursing students?

2.2. Participants and sampling

The study population comprised 170 final-year nursing students enrolled in the nursing department of a university located in eastern Türkiye between November and December 2022. In this faculty, final year nursing students practice Internal Medicine Nursing Care Practices, Surgical Diseases Nursing Care Practices, Obstetrics and Women's Health Nursing Care Practices, Public Health Nursing Care Practices, Child Health and Diseases Nursing Care Practices and Mental Health Nursing Care Practices for five weeks each. They practice for 32 hours a week for 15 weeks each semester. The study included final-year nursing students who took any of these courses for the first time. A power analysis was conducted using OpenEpi Version-3 'Sample Selection with Known Universe,' which determined a sample size of 101 students with an effect size of 80% and a 95% confidence interval.

2.3. Data collection

The study's data was collected through an online questionnaire. The questionnaire forms were converted into an online format using Google Forms and then distributed to the class-representative students via social media groups. Each questionnaire form took approximately 10-15 minutes to complete. The data was collected online.

2.4. Measurements

Data were collected using the 'Participant Introduction Form,' 'Abbreviated Proactive Personality Scale (APPS)' and 'Professional Nursing Values Scale (NPVS),' developed by the researchers following a review of the relevant literature.

2.4.1. Introductory information form

This form, which the researchers developed through a review of the literature, consists of five questions that inquire about the characteristics of final-year nursing students, such as age, gender, and choice of nursing specialty voluntarily.

2.4.2. Abbreviated Proactive Personality Scale (APPS)

Adaptation, validity and reliability studies of the Abbreviated Proactive Personality Scale developed by Bateman and Crant and revised by Claes, Beheydt and Lemmens in 2005 were conducted by Akın and Özcan (1,19,20). It consists of a single dimension and has no reverse-coded items. It is a seven-point Likert scale consisting of 10 items. High scores on the scale indicate that individuals have high proactive personality traits. The Cronbach alpha coefficient of this scale has been reported to be .86. In this study, the Cronbach's alpha coefficient was found to be .90.

2.4.3. Professional Nursing Values Scale (NPVS)

This scale, developed by Weis and Schank, was adapted into Turkish by Geçkil et al., and its validity and reliability were tested (21,22). The five-point Likert-type scale of 26 items has five sub-dimensions, including "caring, professionalism, activism, justice and loyalty." The scale is scored between 26 and 130 points, with high scores indicating high professional values. Cronbach's alpha coefficient on this scale was reported to be .92. In this study, Cronbach's alpha coefficient was found to be .97.

2.5. Data analysis

Data from the study were analyzed using the Statistical Package for the Social Sciences (SPSS) 22 (IBM Corp., Armonk, New York, USA). The Shapiro-Wilk test was used to test the normality of the data. Descriptive statistics, independent groups t-test, Kruskal-Wallis and Pearson correlation tests were used to analyze the data. The correlation value (r) of 0.10-0.29 indicates a low-level relationship, 0.30-0.49 indicates a medium-level relationship and 0.50-1.00 indicates a high-level relationship (23). P values <0.05 were accepted as statistically significant.

2.6. Ethical considerations

Prior to commencing the study, ethical approval (date 08.12.2022 and number 2022/26) was obtained from the Social and Humanities Research Ethics Committee of the university where the research was conducted, and institutional approval was obtained from the faculty where the research was conducted. At the same time, informed consent was obtained from the students via an online form before they participated in the study.

3. Results

It was found that the mean age of the final year nursing students who participated in the study was 22.43±1.89 years, 66.3% were female, 67.3% lived in the city centre, 49.5% chose to nurse

voluntarily, 65.3% expected to 'have a career' from school and 40% expected to 'find an easy job' from nursing (Table 1).

The comparison of the descriptive characteristics of the final year nursing students with the mean total scores of the APPS and NPVS and the mean subscale scores of the NPVS is presented in Table 1. It was found that the difference between the mean total scores of the APPS and NPVS and the mean subscale scores of the NPVS and the gender, school expectations and professional expectations of the final-year nursing students was not statistically significant (Table 1).

It was found that the final-year nursing students who had spent most of their lives in the city centre had higher mean total scores on the APPS and NPVS and higher mean subscale scores on caring, professionalism, activism, justice and loyalty than the final-year nursing students who had lived in the district, and the difference between them was statistically significant (Table 1).

It was found that final-year nursing students who voluntarily chose to nurse had higher mean total scores and mean scores for the professionalism, activism and justice subscales of the NPVS than final-year nursing students who did not voluntarily choose to nurse. The difference between them was statistically significant (Table 1).

Table 1. Comparison of Descriptive Characteristics of Final Year Nursing Students with Mean Total APPS and NPVS Scores and Mean NPVS Subscale Scores.

Descriptive characteristics	**n**	**%**	**APPS (X±SD)**	**NPVS (X±SD)**	**NPVS Sub-dimension (X±SD)**				
					Caring	**Professionalism**	**Activism**	**Justice**	**Loyalty**
	X±SD		**Med(Min-Max)**						
Age	22.43±1.89		22 (19-32)						
Gender									
Female	67	66.3	48.89±10.24	113.59±14.84	35.73±4.28	30.28±4.51	21.64±3.51	13.28±1.96	12.65±1.90
male	34	33.7	50.79±10.57	109.88±17.70	34.38±5.81	29.44±4.88	20.85±3.83	12.73±2.28	12.47±2.06
Test*[#] *p			*t:-0.861* *.392*	*t:1.112* *.274*	*t: 1.321* *.19*	*t: -0.84* *.404*	*t:1.003* *.32*	*t:1.192* *.23*	*t: 0.44* *.66*
Previous place of residence/place of maximum residence									
City centre	68	67.3	51.44±9.96[a]	115.25±13.56[a]	36.35±4.02[a]	30.51±3.98[a]	21.98±3.37[a]	13.48±1.80[a]	12.91±1.78[a]
District	20	19.8	43.45±8.08[b]	102.20±16.33[b]	31.95±4.91[b]	27.60±5.28[b]	19.30±3.43[b]	11.80±2.16[b]	11.55±1.84[b]
Town/Village	13	12.9	48.92±12.30	112.76±20.76	34.76±6.58	31.00±5.83	21.38±4.25	13.07±2.62	12.53±2.47
Test*[ß] *p			*KW:11.111* ***.004***	*KW:9.946* ***.007***	*KW:11.701* ***.003***	*KW:6.288* ***.043***	*KW:9.771* ***.008***	*KW:9.674* ***.008***	*KW:7.045* ***.030***
Choosing the nursing programme voluntarily									
Yes	50	49.5	50.42±9.82	115.36±14.91[a]	36.04±4.33	30.70±4.47[a]	22.12±3.37[a]	13.60±1.92[a]	12.90±2.04
No	18	17.8	46.55±10.92	102.50±18.87[b]	32.61±6.15	27.16±5.88[b]	19.22±4.03[b]	11.77±2.39[b]	11.72±1.70
Partly	33	32.7	49.81±10.81	113.15±13.72	35.57±4.48	30.48±3.54	21.42±3.40	13.06±1.86	12.60±1.37
Test*[ß] *p			*KW:1.289* *.525*	*KW:8.102* ***.017***	*KW:4.419* *.110*	*KW:6.641* ***.036***	*KW:7.768* ***.021***	*KW:11.192* ***.004***	*KW:5.021* *.081*
Expectations from school									
Having a profession	66	65.3	49.98±9.14	114.01±14.74	35.68±4.32	30.57±4.35	21.62±3.54	13.39±1.90	12.74±1.92
Graduating from school	14	13.9	45.28±14.17	104.57±20.51	32.92±6.98	27.57±5.74	20.28±4.08	11.92±2.73	11.85±1.83
Making money	21	20.8	50.95±10.84	112.01±15.12	35.57±4.46	29.80±4.36	21.33±3.63	12.95±1.96	12.61±2.03
Test*[ß] *p			*KW: 1.529* *.465*	*KW: 2.987* *.225*	*KW: 1.432* *.489*	*KW: 4.251* *.119*	*KW: 1.333* *.514*	*KW: 4.764* *.092*	*KW: 2.361* *.307*
Expectations from the nursing profession									
Being a good nurse	41	39.0	49.85±10.45	111.53±17.05	34.90±5.32	30.02±4.95	21.12±3.89	13.09±2.27	12.39±1.94
Having a career	18	17.0	52.55±9.55	115.44±12.70	36.00±3.85	30.50±3.63	22.38±2.61	13.33±1.84	13.22±1.62
Easy to find a job	42	40.0	47.92±10.48	111.80±16.09	35.33±4.86	29.76±4.77	21.19±3.73	13.00±2.02	12.52±2.06
Test*[ß] *p			*KW: 2.37* *.305*	*KW: .512* *.774*	*KW: .708* *.702*	*KW: .286* *.876*	*KW: 1.203* *.548*	*KW: .495* *.781*	*KW: 2.417* *.299*

[#] t: t-test. [ß] KW: Kruskal-Wallis tests were used. [a-b]: Difference between groups

It was found that the final-year nursing students had a mean total score of 49.53±10.34 on the APPS and a mean total score of 112.34±15.87 on the NPVS and had a proactive personality and high professional values above the medium level. It was found that the mean score of the caring sub-dimension of the NPVS was 35.27±4.86. the mean score of the professionalism sub-dimension was 30.00±4.63. the mean score of the activism sub-dimension was 21.37±3.63. the mean score of the justice sub-dimension was 13.09±2.08 and the mean score of the loyalty sub-dimension was 12.59±1.95 and the scores obtained from all the sub-dimensions were high (Table 2).

Table 2. Total Means of APPS. NPVS and NPVS Subscales for Final Year Nursing Students

Scales	X ± SD	Med(Min-Max Puan)	Cronbach α
NPVS total score	49.53±10.34	49.00 (22-68)	.904
APSS total score	112.34±15.87	116.50 (61-130)	.971
Caring	35.27±4.86	36.50 (19-40)	.915
Professionalism	30.00±4.63	31.00 (15-35)	.918
Activism	21.37±3.63	22.00 (11-25)	.925
Justice	13.09±2.08	14.00 (7-15)	.880
Loyalty	12.59±1.95	12.00 (7-15)	.676

In Table 3. it was found that the differences found in the comparisons of final year nursing students' mean total score of APPS. mean total score of NPVS and mean sub-dimension scores of NPVS were statistically positive and moderately significant (Table 3).

Table 3. Correlations Between Mean Scale Total and Subscale Scores for Final Year Nursing Students

	NPVS	**NPVS Sub-dimensions**				
APPS		***Caring***	***Professionalism***	***Activism***	***Justice***	***Loyalty***
r	.477**	.414**	.465**	.444**	.413**	.486**
p	.000	.000	.000	.000	.000	.000

** The correlation is significant at 0.01 level.

4. Discussion

This study examined the relationship between proactive personality traits and professional values in final-year nursing students. Individuals with higher levels of proactive personality traits are more emotionally stable. better able to cope with stress in their environment. and more likely to create opportunities to improve performance than those with lower proactive personality traits (2). In the study. final-year nursing students were found to have proactive personality traits above the average level. Kong et al.. in studies of undergraduate nursing students in China. and Hu et al.. in studies of university students. reported that students had proactive personality traits above the average level (2,24). Our results support the literature. This shows that university students can take initiative and action rather than being passive and reactive.

The study found that the proactive personality of final-year nursing students did not change significantly according to gender. Aybatan. Er. Demir and Arabacı reported no significant difference between gender and proactive personality traits (25,27). A study conducted by Al-Omari and Al-Ghanbosi on nursing students in Oman found that gender was not a significant variable for proactive personality (16). Our results support the literature. The proactive characteristics of men are likely higher because we come from a patriarchal society and the expectations placed on men. such as being brave. taking

responsibility. taking initiative and taking risks when necessary. There is evidence that this perception has changed in contemporary society (28,29). Especially in the university environment. this perception has been destroyed. and it is common for women to be brave. take initiative. and take risks.

The environment in which individuals live and their opportunities can influence personality development (30). The present study observed that final-year nursing students living in the city centre had significantly higher proactive personalities than those living in towns and districts. No study in the literature examined a similar parameter. The fact that the city centre offers more opportunities for a proactive personality and that proactive people prefer to live in the city centre may have caused this result.

The study found that variables such as voluntary choice of department. expectations from school and the nursing profession were not important variables for proactive personality. Proactive individuals will likely take every opportunity to exceed normal job expectations (31). As they act according to the situation they find themselves in or the benefits of the process. it can be assumed that they are not influenced by variables such as choice of department. expectations from school and the nursing profession.

The results of this study showed that final-year nursing students had high professional values. Karadağlı. Elmalı. Okuyan et al. reported that nursing students had high professional values (32,34). The study found that the professional values of final-year nursing students did not vary according to gender. Similar results were reported in studies conducted among nursing students in Iran (35). Our findings are in line with the literature. It can be assumed that the courses for developing nursing philosophy and professional values in nursing education in our country positively affect the perception of professional values of both genders.

The study found that the professional values of final-year nursing students living in the city centre were significantly higher than those living in the district. In contrast to our findings. Elmalı found no change in students' professional values according to their place of residence (33). This finding may be due to the personal characteristics of the final-year nursing students who participated in the study.

It was found that final-year nursing students who voluntarily chose the nursing department had higher professional values than the others. Similar results were reported by Okuyan et al.. Avcı et al. and Taşkıran et al. (34,36,37). Mollaoğlu et al. reported that those who voluntarily chose the nursing profession had a better understanding of the theoretical knowledge and a more positive attitude towards the profession (38). Individuals choosing a career that aligns with their preferences may increase their motivation and make them happy. This may have a direct impact on the professionalism of the profession and. thus. on the development of the profession (39).

In this study. it was found that the professional values of final-year nursing students mainly remained the same according to their expectations from school and the nursing profession. In Karadağlı's study. expectation from school was found to be a significant variable for final-year nursing students' professional values. In contrast. expectation from the nursing profession was not found to be a significant variable in parallel with our finding (32). On the other hand. Elmalı reported that students' professional values did not change significantly according to their expectations from school and the nursing profession (33). Shi et al. concluded that society and families' expectations of the nursing profession and the proportion of those who want their children to become nurses are low in China. However. it was reported that this perception started to change with the feeling of commitment to the

profession after the pandemic (17). It can be said that this result may be because the final-year nursing students' expectations of the nursing profession and school are close.

The study found a positive and moderately significant relationship between proactive personality traits and professional nursing values among final-year nursing students. Shi et al. found a positive and significant relationship between proactive personality traits and professional identity in a study of nursing students (17). Davik et al. found that proactive personality traits influenced professionalism in a study of nurses (18). Demir and Arabacı reported a positive and moderate relationship between proactive personality traits and attitudes towards the profession and desire for career development in a study conducted with another professional group (27). Our findings support the literature and show that proactive personality traits are important for professional values. which are the cornerstone of the nursing profession.

5. Conclusions and Recommendations

The study found that students had proactive personalities and high professional values above the medium level. and their professional values increased as their proactive personality traits increased. Our findings are valuable in highlighting the importance of having a proactive personality and high professional values in nursing. characterized by its role in providing care and treatment to people. The fact that nursing students with strong proactive personalities have high professional values is promising for clinical practice and the profession's future. As these students will work in the field in the future. they can offer more practical and ethical solutions to their problems and improve the existing order. In this direction. it may be recommended that students develop proactive personality traits and professional nursing values. increase their awareness. and conduct the study with larger groups.

Limitations

The study's main limitation is that the data could not be generalized to the population as they were collected from one faculty.

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Research Article

Healthcare Workers' Anxiety Levels and Mindful Attention Awareness Towards the Covid-19 Pandemic

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Abstract

Aim: Mindful attention awareness and anxiety levels of healthcare workers during the COVID-19 pandemic were unknown. In this study, we aimed to measure the behavioral changes of healthcare workers together with their anxiety and mindful attention awareness levels during the pandemic.

Methods: A brief mental health examination was conducted on healthcare workers who were actively involved in the COVID-19 pandemic to identify any dysfunctional anxiety issues associated with COVID-19. A survey containing behavioral changes, as well as a coronavirus anxiety scale and mindful attention awareness scale were administered to healthcare workers during the pandemic.

Results: A total of 146 healthcare workers, 56.2% of women were included in the study. The coronavirus anxiety scale score values of the participants were a mean of 4±4.4 (Min=0-Max=20), and 13.7% of them had high levels of anxiety. The mean score for the mindful attention awareness scale score was a mean 59.4±13.9 (Min=22-Max=90). Females had higher coronavirus anxiety scale scores (p=0.003), but males had greater mindful attention awareness scale scores (p=0.001).

It was determined that the coronavirus anxiety scale total scores averages of healthcare workers whose sleep (p=0.001), out-of-hospital clothing (p=0.006), and eating habits (p=0.017) changed during the pandemic were statistically significantly higher (p<0.05). Healthcare workers with higher coronavirus anxiety scores used more prophylactic drugs and supplements/vitamins after contact with COVID-19 patients.

Conclusions: Although the coronavirus anxiety scale score was below average and the mindful attention awareness scale score was above average, healthcare workers' behaviors changed during the pandemic. Coronavirus anxiety and mindful attention awareness scale levels affected the behaviors of healthcare workers. Psychosocial support programs must be provided to healthcare workers during the pandemic.

Keywords: COVID-19, Anxiety, Healthcare workers, Mindfulness, Behavior, Pandemics

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1. Introduction

Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is a newly detected infectious disease in humans. The first official case of novel coronavirus disease (COVID-19) was announced on 11th March 2020 in Türkiye, and on the same date, the World Health Organization (WHO) declared COVID-19 infection as a global epidemic (1). COVID-19 infection is mostly seen with mild symptoms or asymptomatic. However, while rapidly progressing causes severe pneumonia and acute respiratory distress syndrome (ARDS) in a small group of patients, it can also be mortal (2). Vaccines have changed the course of the pandemic. Studies showed that vaccination with a mRNA COVID-19 vaccine was significantly less likely among patients with COVID-19 hospitalization and disease progression to death or mechanical ventilation (3). However, COVID-19 is still seen all over the world and causes deaths (4).

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Although the vast majority of patients are followed up on an outpatient basis, symptomatic patients are followed up in the hospital. Healthcare workers (HCWs) are involved in all stages of diagnosis, follow-up, care, and treatment of COVID-19 patients. The COVID-19 outbreak poses an excellent risk for HCWs due to the frequency of contact with viruses. While no HCW in China was initially infected with COVID-19, 7% of COVID-19 patients between January 12 and 22, 2020, were HCWs (5). According to data from the Centers for Disease Control and Prevention (CDC), deaths due to COVID-19 infection have occurred among HCWs in the USA (6).

The highly contagious COVID-19 virus, seen for the first time in humans, has caused concern in society. The health system is one of the most difficult institutions to manage during global outbreaks that cause mortality, such as the pandemic. Healthcare teams, who have significant professional responsibility, are affected by pandemics that have socioeconomic and mental impacts on society. In the first study conducted on HCWs in the city of Wuhan, where the COVID-19 outbreak first occurred, it was found that 71.3% of the HCWs had subthreshold and mild, 22.4% moderate, and 6.2% severe mental disorders (7). The mindfulness dimension is defined as the ability to grasp these feelings and thoughts with a balanced awareness rather than their excessive integration of transmissible painful emotions and thoughts. The most common definition of conscious awareness has been defined as mindfulness and awareness of what is happening in the present. Mindfulness is a quality of consciousness that has received a lot of attention in terms of well-being. Mindful awareness includes awareness of emotional processes and brain functions (8). Studies have shown that mindfulness is effective on anxiety, depression, and mental problems (9–11). Mindful awareness and focusing on the present can reduce negative expectations and bad feelings about the future in situations that cause anxiety and stress, such as the COVID-19 pandemic (12).

Individuals' mental health may suffer as a result of the COVID-19 pandemic. At the same time, protective variables like mindfulness, which is a moment-to-moment awareness of one's feelings without judgment, may have a favorable effect on a variety of psychological outcomes throughout the pandemic. The study supports the value of trait mindfulness for psychological consequences during the COVID-19 pandemic (13). Changes in nurse-patient ratios, care for high-risk patients, the risk of getting the disease, treatment for the virus, changes to work circumstances, giving patients intensive, prolonged care while wearing protective equipment, and the potential for the virus to spread to other patients or families can all contribute to the pandemic and cause unsettling emotions in nurses, including anxiety, stigma, burnout, and anger (14). Changes in mindful awareness and anxiety levels are expected in major epidemics such as the COVID-19 pandemic.

This study primarily aimed to investigate the mindful attention awareness (MAA) levels and anxiety levels of HCWs during the pandemic. Secondly, we intended to show HCWs' perspectives toward COVID-19, disease prevention strategies, and behavioral changes.

2. Methods

2.1. Study design and participants

This is a cross-sectional, observational, single-center study that was conducted in a tertiary university hospital. The STROBE standards for reporting observational studies were followed. This study was approved by the Gaziantep University Medical Ethics Committee (No: S-2020-264) and The Scientific Research Ethics Committee of the Turkish Ministry of Health.

HCWs who voluntarily agreed to participate in the study between August 15 and October 15, 2020, at Gaziantep University Sahinbey Research Hospital were included. Power analysis was used to compute the sample size, and the minimum number of patients in each group was determined as p=0.05, 1-=0.80 as 121 individuals in order for a difference of 1(±1) unit to be statistically significant in terms of visual equivalence scale. HCWs who were not actively working at the time of the study (on sick leave, on annual leave, or not delivering care services) were not included in the study.

Research questions of the study:

1. What are the attitudes of healthcare workers towards the COVID-19 pandemic?
2. What is the COVID-19 mindful attention awareness level of healthcare workers?
3. What is the COVID-19 coronavirus anxiety level of healthcare workers?

Inclusion criteria of the study: HCWs who are over 18 years old, work in an active hospital environment, and have patient contact. HCWs consisted of doctors, nurses, and emergency paramedics.

Exclusion criteria of the study: HCWs who had COVID-19 disease, were in the quarantine period, were not actively working in the hospital, and did not agree to participate in the study were excluded from the study.

The HCWs participating in the study filled out the three questionnaires below.

2.2. Measurements

2.2.1. HCWs information form

A questionnaire measuring HCWs' socio-demographic characteristics and attitudes towards the COVID-19 pandemic: It consists of 25 questions measuring HCWs' socio-demographic characteristics and attitudes towards the COVID-19 outbreak.

2.2.2. Coronavirus Anxiety Scale (CAS)

A brief mental health screening of the CAS, developed by S. Lee, was used in the study to identify possible dysfunctional anxiety cases associated with the COVID-19 crisis (15). According to the results obtained by Lee, when the reliability coefficient was 0.93, in studies in Türkiye, Cronbach's alpha reliability coefficient was calculated to be 0.83 (16). The scale consists of 5 questions and one dimension. Scoring the scale: 0=never, 1=rare, less than a day or two, 2=several days, 3=more than seven days, and 4=almost every day in the last two weeks. The highest score that can be obtained from the scale is 20. Scores of 9 and above indicate a high anxiety level (11).

2.2.3. Mindful Attention Awareness Scale (MAAS)

This scale, which was developed by Brown and Ryan in 2003 (8), was adapted into Turkish by Özyeşil et al. in 2011(17). The internal consistency coefficient of the original scale was found to be α=0.82(8). In our study, a form translated into Turkish was applied, and the validity and reliability of the scale were found to be appropriate (17). The MAAS is a 6-score Likert type (1=almost always, 2=most of the time, 3=sometimes, 4=rarely, 5=quite infrequently, 6=almost never). Higher scores on the scale show that conscious awareness is high. MAAS was applied to the sample group selected from Selcuk University students every three weeks, and the test-retest reliability of the scale was r=0.86. To calculate the scale's criterion-related validity, the Self-Understanding Scale, Depression, Anxiety, Stress Scale, and Positive and Negative Affect Scale were used and significant relationships were found between them (17).

2.3. Data collection

The study data were collected by the researcher by interviewing the healthcare professionals at the hospital face-to-face, giving information about the purpose of the study, and obtaining their verbal and written consents. It took HCWs an average of 25-30 minutes to fill out this form.

2.4. Statistical analysis

The data's compliance to normal distribution was tested with the Shapiro-Wilk test, the Mann-Whitney U test was used to compare the scores of the non-normally distributed scale in two groups, and the Kruskal-Wallis and Dunn multiple comparison tests were used for the comparison of more than two independent groups. Spearman rank correlation coefficient was used to test the relationships between numerical variables, and the chi-square test was used to test the relationships between categorical variables. The reliability of the items of the scales was tested with the Cronbach alpha internal consistency coefficient. As descriptive statistics, mean ± standard deviation for numerical variables, number and % values for categorical variables are given. SPSS for Windows version 24.0 package program was used for statistical analysis, and $p < 0.05$ was considered statistically significant

3. Results

A total of 146 HCWs (56.2% female) were enrolled in the study. Participants; 83 (56.8%) were married, 77 (52.7%) were physicians, 65 (44.5%) were nurses, four (2.7%) emergency paramedics. It was determined that 90 (61.6%) of the HCWs were undergraduate or associate degree graduates, and the rest had postgraduate education. Considering the distribution of the workplaces of the participants in the hospital, 81 (55.5%) were in non-surgical units, 49 (33.6%) were in surgical units, seven (4.8%) were in outpatient units, five (3.4%) were in emergency services, four (2.7%) were working in intensive care units (ICU). In the study, 18 (12.3%) of the HCWs had a chronic disease, and 31 (21.2%) were active smokers (Table 1).

Table 1. Characteristics of the participants

Baseline characteristics		**N**	**%**
Age	18-25	13	8.9
	25-29	64	43.8
	30-34	27	18.5
	35-39	26	17.8
	≥ 40	16	11.0
Gender	Woman	82	56.2
	Man	64	43.8
Marital status	Married	83	56.8
	Single	63	43.2
Profession	Physician	77	52.7
	Nurse	65	44.5
	Emergency paramedic	4	2.7
Education	Undergraduate or associate degree	90	61.6
	Postgraduate	56	38.4
Position in hospital	Surgical units	49	33.6
	Non-surgical units	81	55.5
	Emergency clinic	5	3.4
	Intensive care	4	2.7
	Outpatient clinic	7	4.8
Chronic illness	Yes	18	12.3
Smoking	Yes	31	21.2
COVID-19 information	Yes	99	67.8
PPE use	Yes	141	96.6
COVID-19 case definition	Yes	125	85.6
Suspicious COVID-19 case theme	Yes	124	84.9
Drug use after COVID-19 contact	Yes	20	13.7

Use of vitamins/supplements after COVID-19 contact	Yes	63	43.2
Hand washing habit	Same	16	11.0
	More often	128	87.7
	Less	2	1.4
	Never	3	2.1
Use of mask in hospital	Always	115	78.8
	Sometimes	10	6.8
	Often	18	12.3
The mask use in COVID-19 patient contact	Surgical mask	65	44.5
	N95/FF2 mask	78	53.4
	Cloth mask	3	2.1
Use of PPE in COVID-19 patients' care	Never	30	20.5
	Always	58	39.7
	Sometimes	37	25.3
	Often	21	14.4
Uniform at the hospital	Yes	115	78.8
Sleeping habits	Yes	78	53.4
Staying away from family	Yes	96	65.8
Isolation	Yes	78	53.4
Out-of-hospital clothing habits	Yes	98	67.1
Eating habits	Yes	76	52.1
Social media habits	Same	67	45.9
	More often	61	41.8
	Less	18	12.3

Considering the answers of the HCWs to the questions about COVID-19; 99 of the participants (67.8%) received medical information about COVID-19 in their department and/or clinics, 141 (96.6%) knew which personal protective equipment (PPE) to use for COVID-19, 125 (85.6%) knew the COVID-19 case definitions, 124 (84.9%) had suspected COVID-19 case contact, 20 (13.7%) used prophylactic drug after COVID-19 case contact. It was seen that 63 (43.2%) of them used supplements of vitamins/nutrients after contact with a COVID-19 case.

Looking at the responses to the questions about PPE use and behavior change during the COVID-19 pandemic period, 115 (78.8%) of inpatient contacts with no COVID-19 case definition use masks all the time in the hospital, 78 (53.4%) use N95/FF2 masks in COVID-19 patient contact, and 58 (39.7%) also use PPE, which includes visors, overalls, and goggles. There was no significant relationship between the workplace in the hospital and PPE use (P = 0.760). During the pandemic period, it was observed that 128 of the HCWs (87.7%) washed their hands more frequently than usual, 115 (78.8%) wore the uniform in the hospital, and 98 (67.1%) had a change in their out-of-hospital clothing habits. During the pandemic period, 96 (65.8%) of the HCWs in the study were separated from their families for at least one week, and 78 (53.4%) were isolated for at least one week. HCWs (53.4%) changed their sleeping

habits, 76 (52.1%) changed their eating habits, and 61 (41.8%) utilized social media more frequently than usual (Table 1).

The mean ± SD in the CAS score evaluation of the participants was 4.07 ± 4.41 (Min=0-Max=20); 20 (13.7%) of them had high anxiety (score ≥ 9). The mean SD in MAAS score evaluation was found to be 59.42 ± 13.93 (Min=22-Max=90) (Table 2).

Table 2. Anxiety and Mindful Attention Awareness Scale Score

Scales	N	Mean ± SD	Min-Max	Median	Cronbach alfa
Corona Virus Anxiety Scale*	146	4.07 ± 4.41	0 -20	3	0.888
Mindful Attention Awareness Scale**	146	59.42 ± 13.93	22 -90	58.5	0.901
Corona Virus Anxiety Scale					
High anxiety (score≥9)	20	13.7%			
Score < 9	126	86.3%			

*Scoring the Corona Virus Anxiety Scale (CAS); 0=never, 1=rare, less than a day or two, 2=several days, 3=more than seven days, and 4=almost every day in the last two weeks. The highest score that can be obtained from the scale is 20. Scores of 9 and above indicate a high anxiety level.
**The Mindful Attention Awareness Scale (MAAS) is a 6-score Likert Type (1=almost always, 2=most of the time, 3=sometimes, 4=rarely, 5=quite infrequently, 6=almost never). Higher scores on the scale show that conscious awareness is high.

There was no statistical significance in CAS scores between age groups. CAS scores were significantly higher in females (p=0.003), and MAAS scores were significantly higher in males (p=0.001). CAS and MAAS scores were found to be significantly higher in those who were married (p=0.007, p=0.005). CAS scores were found to be significantly higher in patients with COVID-19 case contact (p=0.039) and those using post-exposure drugs (p=0.044). CAS showed a significant difference in the levels of PPE use responses in COVID-19 patient contact (p=0.006). HCWs who never used PPE had a low CAS score (1.73 ± 2.15), while HCWs who always used PPE had a high score (4.59 ± 4.5) (Table 3). According to the multiple comparison test, it was observed that the CAS scores of those who said "I never used PPE" were significantly lower than the other three PPE categories (p=0.047).

MAAS scores were significantly lower in those who used supplemental vitamins/nutrients after COVID-19 contact (p=0.026). In terms of MAAS scores, a significant difference was found between the types of masks used in contact with patients diagnosed with COVID-19 (p=0.024). According to Dunn's multiple comparison test results, the MAAS scores of those using N95/FF2 masks were found to be significantly higher than those using surgical masks (p=0.018).

CAS scores of those whose sleep habits (p=0.001), out-of-hospital clothing habits (p=0.006), and eating habits (p=0.017) were changed during the pandemic period were found to be significantly higher. CAS scores showed a significant difference between the answers given to social media habits (p=0.017) (Table 3). According to Dunn's multiple comparison test results, the scores of those who said: "more often than normal" were found to be significantly higher than those who said, "at the same frequency" (p=0.009). There was no statistically significant difference between sleeping, eating, out-of-hospital clothing, and social media habits changes with MAAS scores.

Table 3. Relationship between COVID-19 Anxiety Scale (CAS) and Mindful Attention Awareness Scale (MAAS) and Demographic Characteristics

Demographic Characteristics	N	CAS Mean ± SD	MAAS Mean ± SD
Age			
18-25	13	2.92 ± 2.33	51.08 ± 13.73
25-29	64	4.06 ± 5.19	59.45 ± 14.63
30-34	27	4.52 ± 4.35	58.19 ± 13.92
35-39	26	4.19 ± 3.92	62 ± 13.17
≥ 40	16	4.06 ± 3.26	63.94 ± 10.26
	KW-H	1.733	6.837
	P	0.785	0.145
Gender			
Woman	82	4.85 ± 4.46	55.59 ± 12.79
Man	64	3.06 ± 4.17	64.33 ± 13.89
	Z	-2.945	-3.441
	P	0.003*	0.001*
Marital status			
Married	83	4.84 ± 4.63	62.34 ± 13.68
Single	63	3.05 ± 3.91	55.57 ± 13.42
	Z	-2.692	-2.825
	P	0.007*	0.005*
Suspicious COVID-19 case theme			
Yes	124	4.36 ± 4.54	59.58 ± 13.56
	Z	-2.067	-0.036
	P	0.039*	0.972
Drug use after COVID-19 case contact			
Yes	20	5.95 ± 5.09	60.35 ± 15.56
	Z	-2.012	-0.194
	P	0.044*	0.846
Use of vitamins/supplements after COVID-19 contact			
Yes	63	4.17 ± 3.86	57.02 ± 12.41
	P		0.026*
Masks type in COVID-19 patients			
Surgical mask	65	3.82 ± 4.28	57.14 ± 14.94
N95/FF2 mask	78	4.32 ± 4.59	61.73 ± 12.73
Cloth mask	3	3 ± 3	48.67 ± 12.34
	KW-H	0.507	7.465
	P	0.776	0.024*
Use of PPE in COVID-19 patients			
Never	30	1.73 ± 2.15	57.8 ± 16.09
Always	58	4.59 ± 4.5	60.43 ± 13.07
Sometimes	37	5.35 ± 5.39	58.57 ± 13.68
Often	21	3.71 ± 3.52	60.43 ± 14.09
	KW-H	12.530	0.815
	P	0.006*	0.846

Sleeping habits			
Yes	78	5.49 ± 4.88	57.77 ± 14.14
	Z	-4.352	-1.594
	P	0.001*	0.111
Out-of-hospital clothing habits			
Yes	98	4.83 ± 4.84	60.13 ± 13.23
	Z	-2.770	-0.181
	P	0.006*	0.856
Eating Habits			
Yes	76	4.79 ± 4.58	57.99 ± 13.24
	Z	-2.378	-1.338
	P	0.017*	0.181
Social media habits			
Same	67	2.87 ± 3.36	60.96 ± 14.69
More often	61	4.8 ± 4.5	57.21 ± 13.38
Less	18	6.06 ± 6.24	61.17 ± 12.51
	KW-H	8.145	2.617
	P	0.017*	0.270

*Significant <0.05 level; KW-H-H: Kruskal Wallis test, Z: Mann Whitney u test.
#Corona Virus Anxiety Scale (CAS); The Mindful Attention Awareness Scale (MAAS)

4. Discussion

Undoubtedly, HCWs are most likely to contact the SARS-CoV-2 virus and are most affected by the COVID-19 outbreak. In this study, 85% of HCWs have frequent contact with suspected COVID-19 patients. Male gender, chronic obstructive pulmonary disease, hypercholesterolemia, type 2 diabetes, malignancy, hypertension, and interstitial lung diseases were found to be risk factors for COVID-19-related mortality (18–20). In this study, 12.3% of the HCWs had a chronic disease, and 21.2% of them were smokers, putting them in the COVID-19 disease risk category. HCWs' median MAAS score was higher than the average, whereas the median CAS score was lower in this study. In studies conducted with surveys from Türkiye, mindfulness was found to be negatively associated with depression and anxiety. Mindfulness has been proven to be negatively related to anxiety and despair during the COVID-19 pandemic (21). In this study, it was found that HCWs' mindfulness score levels while working in the pandemic were negatively associated with COVID-19 anxiety levels. A high level of Mindful Attention Awareness (MAAS) is required to alleviate distress, reduce worry, and accept what is happening (22). A high level of MAA also positively affects the quality of life by increasing the mechanism of coping with factors such as anxiety, depression, and stress in a positive way (23). Looking at pooled data from 44 studies conducted with HCWs in China, where the pandemic first emerged, pooled prevalence rates of moderate to severe post-traumatic stress symptoms, anxiety, depression, and sleep disorders were 27% (95% CI 16%-38%), 17% (13-21%), 15% (13-16%), and 15% (7-23%) (24). Raising the MAA of HCWs is important in terms of coping with the COVID-19 process, reducing stress levels, and increasing mental health in this process. Psychological factors are an important factor in the success of public health strategies used to manage outbreaks (25). In this study, the finding that the level of anxiety of HCWs with high mindfulness is low supports the literature.

It was revealed that 67.8% of the HCW participants received medical information about COVID-19 in the hospital, but a high rate of 96.6% knew how to use PPEs, and 85.6% knew the COVID-19 case definitions. This situation may result from intensive information with the increased use of social media during the pandemic period and increased anxiety. It has been shown that people quarantined at home,

those with high levels of anxiety, used social media more and comply with quarantine and hygiene measures more (26). Similarly, in studies conducted with nurses in the same period as our study, nurses used social media to collect and share information about COVID-19, as well as support each other by highlighting the need for education, changes in care delivery, and redeployment (27).

Although there is no prophylactic drug, nutrient, or vitamin recommended for COVID-19 yet, we have seen that 13.7% of HCWs used prophylactic drugs after COVID-19 patient contact, and 43.2% of them used supplements/vitamins. According to the results of our study, HCWs who took vitamins or supplements after interacting with a COVID-19 patient had significantly lower MAAS scores than those who did not. High MAAS seems to prevent the use of vitamins/supplements with unproven prophylactic or therapeutic effects. It is likely that the high awareness of HCWs about COVID-19 prevents the use of incorrect drug use and supplements that have no therapeutic effect in the management of the pandemic. Randomized studies on the use of supplements/vitamins after COVID-19 contact are still insufficient. A randomized controlled study with high-dose zinc and ascorbic acid found that SARS-CoV-2 infection did not significantly reduce the duration of symptoms (28). Comparative studies show that high-dose Calcifediol or 25-hydroxyvitamin D administration decreases the need for intensive care and decreases the disease's severity (29,30). It has been shown that the use of hydroxychloroquine drug after COVID-19 exposure does not prevent the disease, and the side effects seen in drug users were more than the placebo group (31). We found that HCWs using drugs after exposure to COVID-19 cases had significantly higher CAS scores. We think that this is an uncontrolled individual trial for a viral disease whose treatment is unknown. The fact that the MAAS scores were significantly low in those who used supplements/vitamins after COVID-19 contact supports this situation.

Regardless of the units in our hospital, the use of masks is at similar rates. It was observed that HCWs used more N95/FF2 masks for COVID-19 patient contact, and they "always used PPE" at a lower rate. The fact that the MAAS score of those using N95/FF2 masks was significantly higher than those using surgical masks changed the mask preferred for COVID-19 patient contact. The mask use was found to increase with higher MASS and CAS scores. Participants with low CAS scores also have low PPE use. During the pandemic, the rates of mask use in the hospital were quite high. It was shown that the use of HCWs masks prevented the transmission of COVID-19 by 70% in meta-analyses (32).

Hand washing has become more common, which is one of the methods being taken to limit virus transmission during the pandemic. This may have contributed to the reduction of hospital infections. It has been shown that the hand washing habits of HCWs were also affected by the pandemic. In general, the frequency of HCW hand washing had increased at the onset of the pandemic (33). There was no significant difference in HCWs hand washing habits variability and CAS and MAAS scores. HCWs preferred to wear the uniform while working in the hospital, but 67.1% also changed their clothing habits outside the hospital during the pandemic period.

We have seen that some HCWs do not see their families and remain isolated due to virus exposure. Although the CAS scores of those who were away from their families during the pandemic period and those who were isolated were higher, no significant difference was found. However, the fact that the CAS scores of those who change their sleeping, eating, out-of-hospital clothing habits and who use social media more frequently show that life outside of work is affected by the pandemic and causes behavioral changes in a short time. Although the HCWs' MAAS scores were above average, the pandemic had changed HCWs' behaviors. It is believed that HCWs' understanding of COVID-19 in their knowledge, attitudes, and behaviors can differentiate the epidemic's control phase, expectations, and view scores.

The high anxiety rate of 13.7% among the HCWs indicates that women and married people primarily need psychological support due to the significantly high CAS scores. We see that patients with COVID-19 case contact have higher CAS scores and increase the use of drugs and supplements, whose effectiveness after contact has not been proven. Uncertainty about SARS-CoV-2 can bring along unnecessary drug use and side effects.

5. Conclusions and Recommendations

Working conditions in health institutions became more complex and riskier in terms of infections with the pandemic. In our study, high anxiety was detected in 13.7% of HCWs. Although the average anxiety level of HCWs was normal, some of them had severe anxiety. Anxiety levels were shown to be significantly higher in women, married, those who had contact with a COVID-19 case, and HCWs who took medication following case contact in the present research. Increases in the anxiety levels of healthcare professionals were found to be associated with behavioral changes in their in-hospital and out-of-hospital lives during the pandemic period.

Pandemic medical publications, videos, and photos made by official health institutions and medical specialist associations on social media can be more effective and safer for nutritional information about the disease during pandemic periods. The groups with higher anxiety scores are prioritized, and the psychosocial support programs, telemedicine methods, and interviews with HCWs in the hospital seem to be a mandatory need during the pandemic period.

Strategic plans should be prepared for HCWs in healthcare institutions to prepare for future pandemics. Pandemic plans should determine duty locations, sick leave regulations, change of duty rules, protective equipment rules, and infection control measures. The mental health of healthcare workers is as important as physical health. For this reason, psychiatrists and psychologists should also take part in the pandemic. Strategies to reduce stress during the pandemic should be planned.

Limitations

Our study has limitations due to its single-centered design and the low participation of HCWs in emergency and intensive care units. Due to the heavy workload of HCWs in emergency and intensive care units, survey participation was low. The findings obtained in the study can be generalized to HCWs working in a tertiary university hospital during the first period of pandemics, when the treatment was unclear, no effective vaccine was available, and the epidemic spread around the world.

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Research Article

The Turkish Adaptation Study of the Digital Addiction Scale For Children: A Validity and Reliability Study

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Abstract

Objective: The study was conducted to perform the Turkish validity and reliability study of the Digital Addiction Scale for Children (DASC).

Methods: The study was completed with 259 students (primary school 4th grade, secondary school 5th, 6th, and 7th grades). The research data were analyzed by transferring them to Statistical Package for the Social Science (SPSS) 25 and Amos 22.0 package program. In the validity and reliability analyses of the scale, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), reliability analysis (Cronbach's alpha), and test-retest were performed to determine the internal consistency of the factors.

Results: The Kaiser-Meyer-Olkin value was found to be 0.941 as a result of EFA, and the following fit indices were obtained as a result of CFA; χ^2/sd: 2.258, (RMSEA): 0.07, Comparative Fit Index (CFI): 0.907, Standardized Root Mean Square Residual (SRMR): 0.049. Cronbach's alpha value of the overall 25-item scale was found to be 0.946. As a result of the test-retest, the Intraclass Correlation Coefficient (ICC) was identified as 0.938 for the overall scale.

Conclusion: It was found that the DASC was a valid and reliable measurement tool that could assess the level of digital addiction in Turkish children aged 9-12.

Keywords: Digital addiction, Middle childhood, Scale, Validity, Reliability

1. Introduction

The use of the internet, computers, smartphones, and other electronic devices have increased significantly in recent years (1). As a common feature, the excessive intake of any substance directly activates the reward system in the brain and thus contributes to the reinforcement of behaviors and the formation of memories. This interaction may even lead to the emergence of problems in fulfilling usual responsibilities and duties. Addiction occurs in this way, according to the American Psychiatric Association (APA) (2). In the early 2000s, the individual use of digital tools increased rapidly, and the contents of digital tools also began to form a quality structure. Toys such as Arcade and Tetris began to become much more common than other toys, and this situation increased with the spread of computers and playstations, and their first addicts appeared (3). According to the results of a project carried out with the participation of 25101 children aged between 9 and 16 years from 19 European countries, the frequency of children using smartphones and the amount of internet use increased significantly compared to the results in 2010. Furthermore, less than half of children access the internet via a desktop or laptop computer. On the other hand, 3-15% and 1-18% of children access it through a wearable device and a connected toy, respectively (4). Nowadays, the excessive use of smartphones is considered a "problematic use," although it is not considered an addiction (5). In addition to smartphones, the use of digital devices, such as tablet computers, wearable technology, and game consoles, which the technology world adds to our lives daily, are becoming more common every day (4).

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The use of digital technologies leads to various psychosocial problems in children and adolescents. It was concluded that with the increased internet use, the interaction with the family decreased, the social circle narrowed, and symptoms such as depression and loneliness increased (6). It is stated that individuals with high social anxiety or who need social support turn to the internet to compensate for problems such as loneliness and depression (7,8). It is observed that the use of digital technologies causes negative emotions in children and adolescents.

In today's digital age, there are various metrics used in Turkish literature to measure addiction caused by digital devices such as social media, the internet, and smartphones. It has been found that the nine-item Internet Gaming Disorder Scale Short Form (IGDS9-SF) is a valid and reliable scale that can evaluate internet gaming disorder in Turkish children and young adults aged 13-24 (9). The Smartphone Addiction Scale was developed by Kwon et al. (2013) for adolescents aged ten using Young's Internet Addiction Scale (10) and was adapted into Turkish by Demirci, Orhan, Demirdaş, Akpınar, and Sert (2014) (11). The Digital Addiction Scale for Children is one of the scales developed in this regard.

The DASC was developed by Hawi, Samaha, and Griffiths (2019) in English to evaluate children's overall addiction to digital devices (12). There are studies investigating digital addiction in high school and university students in Türkiye (13-16). However, a scale that is generally used to measure digital addiction in children aged between 9-12 years has not been found. Although it is seen that the problematic use of digital technologies is common among children in our country, there is no scale that evaluates the level of digital addiction. Therefore, it is important to bring the DASC into Turkish in order to define digital addiction in children aged between 9-12 years in Türkiye. Furthermore, it is thought that it will contribute to experts working in Türkiye in terms of providing a scale that they can use both in diagnosis and national and international studies.

The questions of the study conducted with this aim are as follows:

a) Is the DASC a valid scale in a Turkish-speaking community?
b) Is the DASC a reliable scale in a Turkish-speaking community?

2. Materials and Method

2.1. Type and aim of the study

This methodological, descriptive, and correlational study aimed to ensure the Turkish validity and reliability of the DASC. ,

2.2. Time and place of the study

The study was carried out with primary school 4th-grade and secondary school 5th, 6th, and 7th-grade students in two public schools (a primary school and a secondary school) affiliated with the Ministry of National Education between November and December 2020.

2.3. Participants

A total of 1201 students studied in the primary school where the study was conducted. There were a total of 1109 students in the secondary school. Primary school 4th-grade and secondary school 5th, 6th, and 7th-grade students (N:1180) constituted the study population. The number of samples in scale development and adaptation studies in the literature is determined in the following way:

5's rule: There should be at least five cases for each item (variable) (17, 18)

The rule of 10s: There should be at least 10 cases for each item (variable) (17-21)

The rule of 100s: The number of individuals should be five times the number of variables, or 100 individuals should be examined. If communality is low and/or a small number of variables are attributed to each factor, a larger number of individuals is required (19).

The rule of 150: There should be at least 150-300 cases (19, 22)

The rule of 200: There are opinions that there should be at least 200 cases without considering B/D (19)

Additionally, the Kaiser-Meyer-Olkin (KMO) value is obtained as a result of exploratory factor analysis in scale development or adaptation studies to determine whether the sample size is suitable for factorization (20). The fact that the KMO value is greater than 0.60 means that the sample is sufficient. Since the KMO value was obtained as 0.941 in this study, it shows that the study sample was quite sufficient (23).

In this context, the study data were collected from 259 students who volunteered to participate in the study by determining the sample size in line with the principle of taking 5-10 times the number of scale items in line with the literature. The scale's test-retest (n: 59) was performed with 10-25% of the sample (23).

2.4. Data Collection Tools

2.4.1. Questionnaire

The questionnaire was used to examine the age, gender, and grade levels.

2.4.2. Digital Addiction Scale for Children (DASC)

The scale developed by Hawi et al. (2019) is a 5-point Likert scale (1= Never, 2=Sometimes, 3= Rarely, 4= Often, 5= Always) and consists of 25 items. The scale has nine criteria (Preoccupation, Tolerance, Withdrawal, Problems, Conflict, Deception, Displacement, Relapse, Mood modification) and two subscales. A score between 25-125 is obtained from the scale. An increase in the score is interpreted as an increase in the digital addiction level. Cronbach's alpha values for the criteria of the original study were found to be between 0.56 and 0.68, and Cronbach's alpha value for the overall scale was found to be 0.936 (12).

2.5. Ethical dimension of the study

After obtaining permission from the scale owner via e-mail to conduct the Turkish validity and reliability study of the scale, Ethics Committee (No: 07/07/2020-E.15739) approval, approval of the Provincial Directorate of National Education, and written permission from school administrators, parents, and students were obtained.

2.6. Data collection

The online questionnaire link created by the researchers via Google Forms was delivered to WhatsApp groups of parents created by primary school teachers and school administrators by a simple random method by skipping one branch for children to fill it out. The questionnaires filled out by students who volunteered to participate in the study on their mobile phones/tablets or computers were gathered in e-tables via Google Drive. It took the participants approximately 10-15 minutes to fill out the questionnaire and the scale. For the test-retest, the scale was resent online from the WhatsApp groups of the school administration to the children of all parents who had previously participated in the study.

2.7. Data analysis

The data of 259 participants were evaluated by transferring them to the IBM Statistical Package for the Social Science (SPSS) 25 packaged software. Descriptive statistics (n, %) were presented for categorical variables. The Content Validity Index and the Content Validity Ratio were calculated by evaluating the scores given by the experts. In the validity and reliability analyses of the scale, exploratory factor analysis (EFA) was first carried out, then confirmatory factor analysis (CFA) was conducted, and finally, the reliability analysis (Cronbach's alpha) and test-retest were performed to determine the internal consistency of the factors. Pearson’s correlation analysis was used for item-total score analysis. The CFA results of the study were obtained with SPSS Amos 22.0 software. The test-retest was conducted with the Intraclass Correlation Coefficient (ICC).

2.8. Content validity of the scale

The scale, translated from English into Turkish, was sent to nine experts in the fields of Pediatric Nursing, Psychiatric Nursing, Women's Health and Diseases Nursing, Psychological Counseling and Guidance, and Family Medicine for content validity. The experts were asked to evaluate the suitability and intelligibility of each item. They were asked to rate each statement between 1-4 points (1 point: inappropriate, 2 points: somewhat appropriate, 3 points: appropriate, 4 points: completely appropriate) and clearly write their opinions and recommendations for each item. In line with the experts' opinions, the items were reviewed, and necessary changes were made.

The Content Validity Ratio (CVR) was calculated using the formula (Ne= Total number of experts divided by the number of experts saying that the item is essential, N = the total number of experts on the panel). Since the number of experts was 9, the CVR was determined as 1.0 (23, 24).

For all 25 items, nine experts gave the answers "The item is appropriate" and "The item should be slightly revised." Since the number of experts was nine, it can be said that the content validity of the items with a CVR equal to 1 was achieved at a significance level of 5% (11). Our study found the average of the content validity index (CVI) and CVR as 1.0. Since the result CVI≥CVR was reached, the content validity of the scale was statistically significant.

3. Results

3.1. Descriptive characteristics of the participants

The participants comprised 145 (56%) females and 114 (44%) males. The participants' mean age (n: 259) was 10.926 ± 1.09 (Min: 9, Max: 13). While 32 (12.4%) of the students were 4th graders, 96 (37.1%) were 5th graders, and 60 (23.2%) and 71 (27.4%) were 6th graders and 7th graders, respectively.

3.2. Construct validity

EFA and CFA were performed to determine the construct validity of the scale.

3.2.1. Exploratory Factor Analysis (EFA)

EFA was first performed, and the "Principal Components Method" was preferred as a factor extraction method. The Kaiser-Meyer-Olkin (KMO) test was used to determine the sample adequacy to examine the factor structure, while Bartlett's test was used to determine whether factor analysis could be applied to the scale. As seen in Table 1, the KMO value was found to be 0.941 as a result of the EFA applied to the structure consisting of 25 items. Thus, it was revealed that the sample size was adequate to apply factor analysis to the data. According to the results of Bartlett's test of sphericity, significantly high correlations were found between the variables (23). It was concluded that the scale was suitable for applying the factor analysis ($p<0.01$). The exploratory factor analysis was performed to reveal the scale's factor pattern. All items were conceptually loaded into two subscales. Factor-1 subscale explains 45.234% of the total variance, and Factor-2 subscale explains 5.819%. These two subscales together explain 51.052% of the total variance (Table 1).

Table 1. Results of the Exploratory Factor Analysis Regarding the DASC

Items	Factor Loadings "F1"	Factor Loadings "F2"
item8	0.726	
item3	0.706	
item7	0.696	
item1	0.672	
item15	0.664	
item13	0.652	
item9	0.649	
item17	0.640	

item5	0.621	
item14	0.615	
item21	0.610	
item6	0.607	
item24	0.592	
item2	0.565	
item11	0.537	
item19	0.496	
item16		0.817
item4		0.704
item25		0.621
item22		0.614
item12		0.570
item18		0.569
item23		0.476
item10		0.462
item20		0.440
	Variance Explained (%)	**Self-Value (Λ)**
F1	45.234	11.308
F2	5.819	1.455
Total Scale	51.052	
Kaiser-Meyer-Olkin (KMO) test= 0. 941 **χ2** (300)= 3787.984 **Bartlett's test of sphericity (p) =**0.000*		

In the process of developing a scale, CFA should be run using a different data set from the EFA data set (21, 25). However, since EFA and CFA were performed on the same sample in the original study (12), a single sample was studied in this study in accordance with the scale's original study of the scale.

3.2.2. CFA results

The measurement model was established to confirm the structure consisting of 25 items and two factors were analyzed. As a result of the analysis, model improvement studies were performed since it was found that the model did not fit adequately. First, chi-square reduction values ("M.I." values) were examined for possible changes (e3-e13, e6-e14, e4-e8, e5-e14, e7-e11, e19-e25, and e24-e25) to be made in the model by examining the table of modification indices. The model was run by linking the modification with the highest "M.I." value when it was conceptually appropriate. As modifications were made, the model was retested and accepted if appropriate fit indices were obtained. Otherwise, the operations were repeated by making modifications according to other recommended situations in the modification output. The model was accepted or rejected according to the fit index values obtained with the last modification (26). The CFA analysis found that the whole model was validated with 25 items and two subscales. The validated measurement model is shown below (Figure 1).

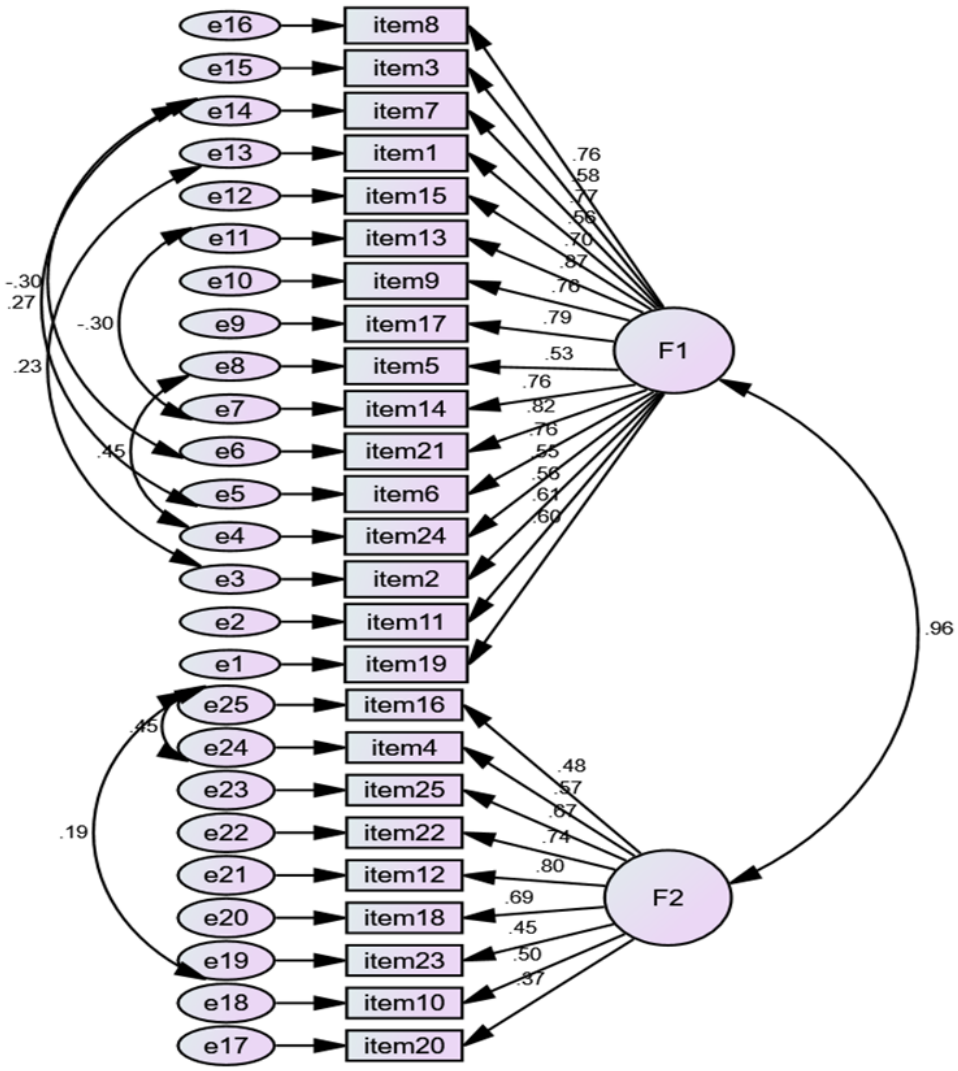

Figure 1. CFA Measurement Model of the DASC

According to the measurement model in Figure 1, the items of the measurement model validated with 25 items and the standardized regression coefficients of the paths on the one-way arrows, in other words, factor loadings are seen. In the model, it was determined which items were included in the subscales, and it was revealed that the scale items had factor loadings between 0.37– 0.87 (Figure 1).

The second-level multi-factor model is defined as the model in which the observable variables are gathered under more than one independent factor, and then these factors are combined under a more inclusive factor (27). In the scale adaptation study, the establishment of the second-level multi-factor model is not mandatory for the additiveness of the scale. Since the additive analyses of the scale can be performed with ANOVA Tukey's test within the scope of reliability analyses, CFA was performed on a first-level multi-factor model. Table 2 contains the CFA fit index results of the scale.

Table 2. Fit Index Values and Good Fit Values of the Measurement Model

Fit Index	Fit Index Values	Perfect Fit Values	Acceptable Values	Compliance
χ^2/sd	2.258	≤3	≤5	
CFI	0.907	≥ 0.97	≥ 0.85	
RMSEA	0.070	≤ 0.08	≤ 0.10	
SRMR	0.049	≤ 0.05	≤ 0.10	

CFI: *Comparative Fit Index,* ***RMSEA:*** *Root Mean Square Error of Approximation,* ***SRMR:*** *Standardized Root Mean Square Residual*

3.2.3. Scale reliability studies

Cronbach's alpha reliability coefficient in terms of internal consistency

The alpha coefficient is a measure of the homogeneity of the scale items. It can be explained that with the increase in the alpha coefficient of the scale, "the scale items consist of items that are consistent with each other and that examine the elements of the same feature, or all items work together." In conclusion, if the alpha coefficient is high, respondents' answers to the scale items are consistent to that extent and consist of items that do not leave the conceptual structure of the scale (23).

The reliability analysis found that Cronbach's alpha coefficient was 0.935 for factor 1 subscale consisting of 16 items, 0.830 for factor 2 consisting of 9 items, and 0.946 for the overall scale, and reliability levels were high (α>0.700) (Table 3).

Table 3. Results of the Reliability Analysis Regarding the DASC

Criteria	**Cronbach's Alpha**	**N of Items**
Deception	0.733	2 (items 4, 16)
Conflict	0.694	2 (items 9, 22)
Displacement	0.611	3 (items 6, 18, 20)
Problems	0.713	4 (items 10, 13, 23, 25)
Preoccupation	0.656	3 (items 1, 11, 14)
Relapse	0.686	2 (items 17, 19)
Mood modification	0.763	3 (items 5, 15, 24)
Withdrawal	0.852	4 (items 3, 8, 12, 21)
Tolerance	0.656	2 (items 2, 7)
Factor 1	0.935	16
Factor 2	0.830	9
Total Scale	0.946	25

Test-retest reliability

The scale was applied again to 59 of 259 individuals who participated in the study two weeks later to measure the scale's stability. A high fit was revealed between the retest and the first test for the overall scale (ICC=0.938, p=0.000) (Table 4).

Table 4. Test-Retest Results of the DASC

	ICC *	**ICC Values at the 95% Confidence Interval**	**P**
Factor 1	0.930	(0.917-0.942)	
Factor 2	0.819	(0.783-0.851)	**0.000***
Total Scale	0. 938	(0.925-0. 949)	

*p<0.001

Item–total score analysis of the scale and its sub-dimensions

The item–total score analysis explains the relationship between the scores obtained from each item and the scale's total score (28-30). This value should be >0.20, positive, and as close to 1 as possible (31). In this study, the correlation of the items with the scale's total score was 0.34–0.83, and the correlation of the items with the total score of the subscales was 0.53–0.83. The correlation coefficients of the item–total score and the item–subscale total score were positive and >0.20 (Table 5).

Table 5. Correlations of the Item–Total Score and Subscale Total Score (n = 259)

Items	X	SD	Item–total score correlation (r)*	Item–subscale total score correlation (r)*
Item 1	2.76	1.11	0.622**	0.622**
Item 2	2.25	1.19	0.617**	0.617**
Item 3	2.03	1.22	0.638**	0.638**
Item 4	1.31	0.81	0.484**	0.644**
Item 5	2.22	1.47	0.636**	0.636**
Item 6	1.76	1.09	0.760**	0.760**
Item 7	2.13	1.22	0.774**	0.774**
Item 8	2.06	1.31	0.793**	0.793**
Item 9	1.91	1.28	0.771**	0.771**
Item 10	1.52	0.99	0.451**	0.588**
Item 11	2.00	1.27	0.666**	0.666**
Item 12	1.66	1.08	0.735**	0.765**
Item 13	2.01	1.30	0.835**	0.835**
Item 14	1.59	0.96	0.752**	0.752**
Item 15	1.99	1.18	0.730**	0.730**
Item 16	1.22	0.66	0.378**	0.654**
Item 17	1.95	1.27	0.790**	0.790**
Item 18	1.62	1.07	0.627**	0.715**
Item 19	2.20	1.26	0.635**	0.635**
Item 20	1.93	1.28	0.349**	0.551**
Item 21	1.81	1.26	0.785**	0.785**
Item 22	1.59	1.04	0.670**	0.746**
Item 23	1.29	0.74	0.419**	0.536**
Item 24	2.23	1.34	0.638**	0.638**
Item 25	1.51	0.96	0.589**	0.738**

Hotelling's T-squared analysis is an analysis that provides information about whether the phenomenon to be measured can be measured effectively with the existing measurement tool. (32). According to Table 6, Tukey's additivity test was applied to obtain a total scale score by summing the scale items. Considering the results, it can be said that the questions constituting the scale are homogeneous and related to each other ($p<0.05$). When the additivity line was examined, it was determined that the options included in the test did not show the Likert-type additive scale quality since the p-value was not >0.05 (32).

Table 6. Information about the DASC ANOVA Tukey's nonadditivity analysis

			Sum of Squares	df	Mean Square	F	p
Between People			3751.001	258	14.539		
Within People	Between Items		798.189	24	33.258	42.352	0.000
	Residual	Nonadditivity	74.923[a]	1	74.923	96.887	0.000
		Balance	4787.528	6191	0.773		
		Total	4862.451	6192	0.785		
	Total		5660.640	6216	0.911		
Total			9411.641	6474	1.454		
Grand Mean = 1.8659							
a. Türkiye's estimate of power to which observations must be raised to achieve additivity = .249.							

In the original article of the scale, it was stated that people who approved criteria four and below were defined as 'nonaddicts,' and people who approved criteria five and above were defined as 'addicts', and it would be appropriate to evaluate the scale in this way (12).

The Hotelling T-value was at a significant level ($p<0.05$). In this context, it was shown that the scale could measure the desired quality at a significant level (32) (Table 7).

Table 7. Results on the DASC Hotelling's T-Squared Analysis

Hotelling's T-Squared	F	df1	df2	p
690.226	26.196	24	235	0.000

The Intraclass Correlation Coefficient test is an analysis that provides information about the validity and reliability of the scale in terms of the order of questions and structure characteristics. According to the results, it was found to be a reliable structure both in terms of individual questions and average measurements ($p<0.05$) (Table 8).

Table 8. The results of the Intraclass Correlation Coefficient analysis of the DASC

	Intraclass Correlation[b]	95% Confidence Interval		F-Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	p
Single Measures	0.412[a]	0.369	0.459	18.514	258	6192	0.000
Average Measures	0.946[c]	0.936	0.955	18.514	258	6192	0.000
Two-way mixed effects model where people effects are random and measures effects are fixed.							
a. The estimator is the same whether the interaction effect is present or not.							
b. Type C intraclass correlation coefficients using a consistency definition-the between-measure variance are excluded from the denominator variance.							
c. This estimate is computed assuming that the interaction effect is absent because it is not estimable otherwise.							

4. Discussion

In the Turkish literature, studies conducted in different age groups were not found in the reviews as an "internet addiction or digital addiction scale." The "Digital Addiction Scale" for university students (15, 33) and another "Digital Addiction Scale" were developed by different researchers to measure digital addiction in high school and university students (14, 16). The Digital Game Addiction Scale was developed to determine problematic digital game-playing behaviors of adolescents aged between 12-18 years (34). The Smartphone Addiction Scale was developed by Kwon et al. (2013) for adolescents aged ten years (10) and is used for secondary school students (35). This study is important since no measurement tool that measures digital addiction in children from the age of nine and whose validity and reliability in Turkish was studied was found.

Factor analysis, one of the common methods in evaluating construct validity, examines whether the scale items are gathered under different dimensions (36). In this study, EFA and CFA were conducted in the construct validity part of the scale. The Kaiser-Meyer-Olkin (KMO) test, showing whether the sample size of the scale is adequate, and Bartlett's test, determining whether the scale is suitable for factor analysis, were first carried out. The adequacy of the sample size is evaluated by examining the KMO value. KMO value between 0.90-1.00 indicates a perfect sample size (23). The fact that the KMO value was 0.941 in this study showed that the sample size was at a "very good" level in terms of adequacy. Furthermore, the result of Bartlett's test of sphericity, performed to evaluate the suitability of the sample for factor analysis, should be statistically significant (23). In the study by Hawi et al. (2019), the KMO value (0.960) and Barlett's test of sphericity results were similar to our study (12). These results showed that the sample size was appropriate for factor analysis.

EFA evaluates whether the relationship of the items making up a factor with the factor is sufficient (23). In the literature, it was indicated that in EFA, the ratio of explaining the total variance of the factor loadings created between 40% and 60% would be considered sufficient, and the items with a factor loading value below 0.32 should be excluded from the analysis (37). According to the EFA results of the DASC in this study, it was determined that the scale, together with its subscales, explained 51.052% of the total variance, and factor loadings were over 0.40. In the original study of the scale, the total variance of the whole scale was 46.32% (12). Both our study and the original scale study are similar to the literature.

In the study by Hawi et al. (2019), thirteen items were loaded on component 1, including the complete item sets of conflict, displacement, and problems criteria. Twelve items were loaded on component 2, including the complete item sets of mood modification, withdrawal, and tolerance criteria (12). However, in this study, 16 items were loaded into component 1, and nine items were loaded into component 2. It can be said that this situation originates from cultural differences, which are wrong equivalent of the psychological terms used (38, 39). Therefore, it is usual that the validity and reliability values are different in scale adaptation studies from different cultures.

After EFA, CFA was performed to confirm the structure. It was found that the model was validated with 25 items and two subscales, and the factor loadings of the items varied between 0.37– 0.87. In CFA, the value of the factor loading is required to be at least 0.30, and it is emphasized that the items below this value should be removed from the scale (22). As a result of the CFA conducted to determine whether the structure in the original scale was confirmed for Turkish children, the values of $\chi 2/sd<3$, RMSEA≤ 0.08, and SRMR≤ 0.05 among the fit indices showed a perfect fit according to the criteria specified in the literature, and the value CFI≥≥ 0.85 was acceptable (χ^2/sd: 2.258, RMSEA: 0.07, CFI: 0.907, SRMR: 0.049) (9, 23, 26, 37). In the original study of the scale, similar results, χ^2/sd: 2.434, RMSEA: 0.0418, CFI: 0.959, and SRMR: 0.0337 (12), were obtained with our study.

Cronbach's alpha reliability coefficient and test-retest method were used to calculate the scale's reliability. The literature emphasizes that Cronbach's alpha value should be 0.60 and above (23). As a result of Cronbach's alpha analysis, the overall reliability coefficient of the DASC consisting of 25 items was found to be 0.946, and Cronbach's alpha internal consistency coefficient of the subscales and criteria was found to be between 0.611 and 0.935. In the original study of the scale (12), Cronbach's alpha value of the overall scale was 0.936, and the value of the criteria was found to be between 0.56 and 0.68, which is similar to our result. Furthermore, the results support that the overall scale is highly reliable.

The test-retest analysis is also among the most commonly used reliability methods. The test-retest analysis examines the scale's consistency in repetitive applications and its invariance over time (36). In this study, the scale was applied to 59 individuals at two-week intervals. A high fit was observed between the retest and the first test (ICC= 0.938), which indicated no variance over time in the DASC and its subscales and that the DASC was reliable.

5. Conclusions and Recommendations

Based on the content validity, construct validity and reliability values of the scale, it was found that the DASC was a reliable measurement tool to measure digital addiction in children studying in grades 4 - 7 of primary and secondary schools (9-12 years old) in the Turkish literature. It is recommended to apply the scale to clinically diagnosed individuals and examine whether it can distinguish between digital addicts and non-addicted individuals. It is necessary to test the scale's measurement invariance in terms of gender and different cultures. To this end, the scale should be used by Turkish researchers in international studies, and measurement invariance should be examined by multi-group confirmatory factor analysis. Only when these studies are completed, it may be possible to use the scale more reliably in international studies. Furthermore, the scale may help develop programs to prevent digital addiction in children. In future studies, it may be recommended to repeat the validity and reliability of the scale in different groups of children, conduct studies that reveal the effects of individual and dynamic variables on the occurrence of the problem, and use it in prevalence studies in the community.

Limitations

Our study has some limitations. First, our sampling technique was not random, and the participants were selected by the convenience sampling technique, significantly limiting the sample's representativeness. In future studies, determining participants by the random sampling technique as much as possible will ensure the representativeness of the sample. The second important issue was that research was conducted with individuals not diagnosed with digital addiction while collecting the data. It was considered that this situation caused the scale to lack clinical validity.

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Research Article

Prevalence of Anaemia in Pregnant Women Registered in a Family Health Centre in Kütahya

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Abstract

Objective: The aim of this study was to determine the prevalence of anaemia in pregnant women enrolled in a family health centre in Kütahya and to determine the proportion of pregnant women with low haemotocrit, low ferritin and vitamin B12 deficiency and some factors affecting them.

Method: The population and sample of this retrospective study consisted of 91 pregnant women who were registered to Yıldırım Bayazıt FHC between 01 October and December 2021 and whose medical records were complete. Haemoglobin, haematocrit, ferritin, vitamin B12 values of pregnant women were examined.

Results: The mean age of the pregnant women included in the study was 28.83±8.61 years. Anaemia was found in 7 (7.7%), low haemotochrit in 3 (3.3%), low ferritin in 67 (73.6%), and B12 deficiency in 19 (20.9%) of the pregnant women. It was found that haemoglobin, haematocrit and ferritin values of pregnant women did not differ significantly according to age, educational status, number of pregnancies, nutrition and planning status of pregnancy (p>0.05).

Conclusion: Low ferritin levels were found to be high in pregnant women in our study group. Ferritin levels of pregnant women should be monitored in Family Health Centres.

Keywords: Pregnant women, Anaemia, Ferritin, Vitamin B12

1. Introduction

Anaemia is a condition in which the number of erythrocytes or the concentration of haemoglobin in them is lower than normal (1). When anaemia occurs, the capacity of the blood to carry oxygen to body tissues decreases. This results in symptoms such as fatigue, weakness, dizziness and shortness of breath (1). The optimal haemoglobin concentration required to meet physiological needs varies according to age, gender, high altitude, smoking habits and pregnancy status (1,2).

Anaemia can be classified as acquired or hereditary (2). Iron, folate and vitamin B12 deficiency anaemia, anaemias due to blood loss, anaemias of chronic diseases, acquired haemolytic anaemias and aplastic anaemias are considered acquired anaemias, while sickle cell anaemia, thalassemia and Fanconi anaemias are considered hereditary (1). Anaemia has mainly three causes: blood loss, increased blood destruction and decreased blood production (2). The most common causes of anaemia due to decreased blood production include nutritional deficiencies, especially iron deficiency (1-4). Folic acid and vitamin B12 deficiencies are other important causes (5). Anaemia is a very common disease affecting one third of the global population (1). In most cases, it is mild and asymptomatic and does not require any treatment. Its prevalence increases with age and is more common in women of reproductive age, pregnant women and the elderly (1). Anaemia is a global public health problem affecting especially children, women of reproductive age and pregnant women (5). It is estimated that one third of all

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women of reproductive age are anaemic. WHO estimates that 42% of children younger than five years and 40% of pregnant women are anaemic worldwide (5). The prevalence of anaemia in pregnant women is estimated to be 18% in developed countries and 35-75% in developing countries (4,5). In Türkiye, the prevalence of anaemia among women of reproductive age varies between 20.0% and 39.9% (6).
Maternal anaemia affects pregnancy outcomes negatively. Anaemia in pregnancy is associated with an increased risk of maternal morbidity and mortality and an increased risk of growth retardation, low birth weight, preterm birth and perinatal mortality in the foetus (6). In addition, maternal anaemia is responsible for 20-40% of maternal mortality due to direct or indirect causes including heart failure, pre-eclampsia, antepartum haemorrhage, postpartum haemorrhage and puerperal sepsis (6). Mild iron deficiency anaemia is observed in women of reproductive age; this condition is usually seen due to inadequate iron intake and monthly loss with the menstrual cycle (1). In pregnancy, iron deficiency anaemia is most common, followed by vitamin B12 and folic acid deficiency anaemia (7,8). In Türkiye, iron, vitamin and mineral supplements are provided free of charge to pregnant women by the Ministry of Health. By using these preparations, health problems related to anaemia and micronutrient deficiencies are tried to be prevented in all pregnant women (8).
Many studies related with anaemia of pregnancy have been conducted in Türkiye (9-15). However, no research on anaemia of pregnancy has been conducted in Kütahya. This will be the first study conducted in this subject in Kütahya. In addition, determining the prevalence of anaemia of pregnancy and some factors affecting it in Kütahya will contribute to the knowledge of the extent of the problem and the solution of the problem. In this study, we aimed to determine the prevalence of anaemia, the rate of pregnant women with low haemotocrit, low ferritin and vitamin B12 deficiency, and some factors affecting them in pregnant women registered to Yıldırım Bayazıt Family Health Centre in Kütahya.
Research Questions:
1: How common is anaemia during pregnancy?
2: What is the frequency of low Haematocrit and ferritin during pregnancy?
3: How common is vitamin B12 deficiency during pregnancy?
4: Is there any difference between the groups in pregnant women with anaemia, low haemotocrit, low ferritin and vitamin B12 deficiency?

2. Material and methods

2.1. Type of research

This is a retrospective study.

2.2. Place and time of the study

This study was conducted at Yıldırım Bayazıt Family Health Centre (FHC) in Kütahya between 01 October and December 2021. Kütahya is a province located in the west of the Republic of Türkiye. According to the year 2021, the population of Kütahya is 578640. This population consists of 284739 (49.21%) males and 293901 (50.79%) females. Of the total population of Kütahya, 277270 (47.92%) live in the central district. Of those living in the central district, 136730 were male, and 140540 were female (16). A total of 3994 people (2052 females and 1942 males) were registered to Yıldırım Bayazıt ASM where the study was conducted. At the time of the study, 91 pregnant women were registered to Yıldırım Bayazıt FHC. The research was conducted.

2.3. Population and sample of the study

The population and sample of the study consisted of the medical records of pregnant women registered to Yıldırım Bayazıt FHC. 91 pregnant women who were registered to Yıldırım Bayazıt FHC between 01 October and December 2021 and whose medical records were complete constituted the sample.

2.4. Data collection tools

Pregnancy Follow-up Form: Information on age (year), educational status, number of pregnancies, medication, smoking and alcohol use were obtained. Family Medicine Information System (FHIS): Haemoglobin, haemotocrit, ferritin, vitamin B12 values of pregnant women were obtained from laboratory records of the Family Medicine Information System (FHIS).

In accordance with the recommendations of the Centers for Disease Control and Prevention (CDC), pregnant women with a haemoglobin value below 11 g/dl were considered anaemic and pregnant women with a haemotocrit value below 33% were considered to have a low haemotocrit value (17,18). Ferritin values below 20 ml/ng were considered as low ferritin and vitamin B12 values below 150 pg/ml were considered as low B12 (19,20).

2.5. Evaluation of data

SPSS 22.0 programme was used for data analysis. In descriptive statistics, continuous variables were defined as mean and standard deviation, and categorical variables were defined as number and percentage. Independent student t-test for continuous variables and one-way analysis of variance (ANOVA) were used to analyse the differences between groups. Tukey test was used as a post-hoc test to determine which group was responsible for the difference between more than two groups. Logistic regression (LR) analysis was performed to evaluate the relationship between the characteristics of the participants and B12 deficiency. Hosmer-Lemeshow goodness-of-fit test was used to evaluate model fit. $p< 0.05$ was considered significant.

2.6. Ethical approval

Ethics committee approval (Decision No: 2022/07-03 Date: 22.06.2022) was obtained from Kütahya Health Sciences University Non-Interventional Clinical Research Ethics Committee and necessary permission was obtained from Kütahya Provincial Health Directorate. The study was conducted in accordance with the Principles of the Declaration of Helsinki.

3. Results

A total of 91 pregnant women were included in the study. While 33 (36.3%) of the participants were under the age of twenty four years, 37 (40.7%) were between the ages of 25-34, and 21 (23.1%) were 35 years and over. Forty-four (48.4%) of the pregnant women were university graduates. Some descriptive characteristics of the pregnant women are shown in Table 1.

Table 1. Descriptive Characteristics of Pregnant Women (n=91)

Features	n (%)
Age (year)	
18-24 years	33 (36.3)
25-34 years	37(40.7)
35 years and over	21(23.1)
Educational status	
Primary school	12(13.2)
High school	35(38.5)
University	44(48.4)
Pregnancy number	
1st pregnancy	37(40.7)
2nd pregnancy	35(38.5)
3 and more pregnancies	19(20.9)
Pregnancy planning	
Yes	68(74.7)
No	23(25.3)

Medication	
Yes	4(4.4)
No	4(95.6)
Smoking	
Yes	2(2.2)
No	89(97.8)
Alcohol	
Yes	0 (0.0)
No	91(100.0)

Anaemia was found in 7 (7.7%), low haemotocrit in 3 (3.3%), low ferritin in 67 (73.6%) and B12 deficiency in 19 (20.9%) pregnant women. Table 2 shows the distribution of haematological values in pregnant women.

Table 2. Distribution of Haematological Values in Pregnant Women (n=91)

Parameter	Reference range	n (%)
Haemoglobin	<11	7 (7.7)*
	≥11	84 (92.3)
Haematocrit	<33	3 (3.3)**
	≥33	88 (96.7)
Ferritin	≤20	67 (73.6)***
	>20	24 (26.4)
Vitamin B12	<150	19 (20.9)****
	≥150	72 (79.1)

*Anemic, **Low haemotocrit, ***Low ferritin, ****B12 deficiency

The mean haemoglobin values of the pregnant women included in the study were 12.88±1.15 g/dl (min-max: 9.10-15.50), 38.76±3.08 (min-max: 28.20-49.10), 19.83±18.96 ml/ng (min-max: 1.70-113.00) and 221.11±90.76 pg/ml (min-max: 60.00-670.00). Haemoglobin and haemotocrit values of pregnant women did not differ significantly according to age, educational status, number of pregnancies, nutrition and pregnancy planning status (Table 3). A statistical difference was found between pregnancy planning status and B12 values (t=2.131, p=0.036). A statistical difference was found between the age of pregnant women and B12 values (F=3.121, p=0.049). Post-hoc test was applied to determine which group the difference originated from. The difference was found between 18-24 years and 25-34 years (p=0.038) (Table 4).

Table 3. The Relationship Between Age, Education Level, Number of Pregnancy and Planning Status of Pregnancy and Haemoglobin and Haemotocrit Values of Pregnant Women

	Haemoglobin (g/dl)		Haemotocrit	
Features	**Mean±SD**	**F;p**	**Mean±SD**	**F;p**
Age (year)				
18-24 years[a]	12.73±1.11	0.485;0.617	38.48±2.85	0.207;0.814
25-34 years[b]	13.00±1.03506		38.93±2.59	
35 years and over [c]	12.90±1.40		38.90±4.18	
Educational status				
Primary education	12.55±1.08	0.592;0.556	38.15±2.63	0.445;0.642
High school	12.97±0.87		38.62±2.18	
University	12.89±1.35		39.04±3.77	
Pregnancy number				
1st pregnancy	12.82±1.18	0.466;0.629	38.37±2.97	0.621;0.540
2st pregnancy	12.82±0.97		38.88±2.37	
3 and more pregnancies	13.10±1.39		39.31±4.31	
Pregnancy planning				

Yes	12.97±1.22	1.284;0.203	39.12±3.22	1.936;0.056
No	12.61±0.88		37.70±20.39	

Mean: Average; SD: Standard deviation

Table 4. The Relationship Between Ferritin and B12 Values of Pregnant Women and Age, Education Level, Number of Pregnancy and Planning Status of Pregnancy

	Ferritin (ml/ng)		B12 (pg/ml)	
Feature	**Mean±SD**	**F;p**	**Mean±SD**	**F;p**
Age (year)				
18-24 years[a]	18.96±15.56	0.145;0.865	249.26±103.94	3.121;0.049
25-34 years[b]	21.14±20.96		196.21±77.06	Tukey test: a-b (p:0.038); a-c (p:0.485); b-c (p:0.571)
35 years and over[c]	18.91±20.85		220.7619±81.47	
Educational status				
Primary education	24.07±17.32	0.688;0.505	167.00±44.68	2.752;0.069
High school	21.18±21.18		222.25±113.10	
University	17.60±17.60		234.97±74.83	
Pregnancy number				
1st pregnancy	19.32±19.17	0.057;0.945	214.77±82.88	0.167;0.846
2nd pregnancy	20.69±17.13		227.18±101.48	
3 and more pregnancies	19.25±22.49		222.31±88.54	
Pregnancy planning				
Yes	20.69±18.07	0.742;0.460	232.68±95.29	2.131;0.036
No	17.29±21.62		186.93±66.37	

Mean: Average; SD: Standard deviation

Logistic Regression (LR) analysis was performed by including age groups, educational status, number of pregnancies and whether the pregnancy was planned or not in the model, which were found to be statistically significant by ANOVA and t-test and which could be risk factors for B12 deficiency. According to the Hosmer-Lemeshow test, the fit of the model was evaluated as good ($\chi 2=9.693$, $p=0.287$, $R2=0.213$). As a result of logistic regression analysis, B12 deficiency was found to be 9.687 times higher in the 25-34 age group compared to the 35 years and older group ($p=0.04$). As a result of logistic regression analysis, B12 deficiency was found to be 4.932 times higher in the group with 1st pregnancy, 4.932 times higher in the group with 2nd pregnancy ($p=0.039$) and 7.711 times higher in the group with 3rd or more pregnancies ($p=0.043$). No relation was found between educational status and planned pregnancy and B12 deficiency (Table 5).

Table 5. Logistic regression analysis for factors associated with B12 deficiency

	β	St. Error	Wald	p	OR	95% Confidence interval for OR	
						Lower limit	Upper limit
Age (year)							
35 years and over*			7.053	0.029	1		
25-34 years	2.271	1.108	4.198	0.040	9.687	1.104	85.019
18-24 years	0.160	0.820	0.038	0.845	1.174	0.235	5.854
Pregnancy planning							
Yes*					1		
No	-0.566	0.636	0.793	0.373	0.568	0.163	1.973
Educational status							
Primary Education*			1.762	0.414	1		
High school	0.959	0.843	1.293	0.255	2.609	0.500	13.630
University	1.014	0.795	1.629	0.202	2.757	0.581	13.084
Pregnancy Number							
1st pregnancy*			5,354	0.069	1		
2nd pregnancy	1.596	0.775	4,244	0.039	4.932	1.081	22.507
3rd and higher pregnancy	2.043	1.011	4,083	0.043	7.711	1.063	55.932

β: Regression coefficient, St. Error: Standard error; OR: Odds Ratio; *: reference category

4. Discussion

Anaemia was found in 7.7% and low ferritin in 73.6% of the pregnant women. No significant difference was found between haemoglobin, haemotocrit and ferritin values of pregnant women according to age, educational status, number of pregnancies, nutrition and planning status of pregnancy. The percentage of pregnant women with vitamin B12 deficiency was 20.9%. B12 deficiency was found to be 9.687 times higher in the 25-34 age group than in the 35 years and older group, 4.932 times higher in the group with the first pregnancy than in the group with the second pregnancy, and 7.711 times higher in the group with the third or more pregnancies. No relationship was found between educational status and planned pregnancy and B12 deficiency.

Many studies have been conducted in our country regarding the prevalence of anaemia in pregnant women (9-15). According to these studies, the prevalence of anaemia in pregnancy in our country varies between 20% and 74.1%. However, the prevalence of anaemia in our country is still not known exactly (21,22). In a study conducted in Elazığ, the prevalence of anaemia in pregnancy was found to be 27.9%, in a study conducted in women presenting for delivery, the prevalence of anaemia was found to be 41.6%, in the study by Öztürk et al. the prevalence of anaemia was found to be 20.0%, and in the study by Çıkım et al. the prevalence was found to be 24.2% (12-15). It was found to be 23.5% in a study conducted in Tokat, 19.7% in a study conducted in Batman, and 23.3% in a study conducted in Şanlıurfa (9-11). In our study, the prevalence of anaemia in pregnant women enrolled in Kütahya Yıldırım Bayazıt FHC was found to be 7.7%. According to our study, the prevalence of anaemia in pregnant women is not similar to other studies. When compared with these studies, it is seen to be lower. The fact that the studies were conducted in different samples may have led to this result. The other reason for this result may be considered as a result of the successful implementation of iron supplementation for pregnant women by the Ministry of Health in the ASM where the study was conducted. However, in order to make this evaluation, studies specifically analysing this issue are needed.

The most important cause of anaemia in pregnancy is iron deficiency (1-3,5). Serum ferritin level is an indicator of total iron storage and its low level indicates iron deficiency (23). In our study, the mean ferritin level was found to be 19.83±18.96, whereas it was found to be 27.5±24.7 in a study conducted in Şanlıurfa (24). In addition, the rate of pregnant women with ferritin values below 20 µg/L was 73.6%

in our study. In the study by Çıkım et al. the rate of pregnant women with low ferritin was 20.8% (14). In the study by Sayar et al. low ferritin was found in 28% of pregnant women (22). When compared with other studies, both the mean ferritin values were lower and the rate of pregnant women with low ferritin levels was higher in our study. In iron deficiency, the decrease in ferritin levels occurs earlier than serum iron, transferrin saturation and haemoglobin values (14). Therefore, low ferritin levels are more important than others. Although the prevalence of anaemia was low in the pregnant women included in our study, the high rate of low ferritin values suggests that there is a risk of anaemia if the pregnant women are followed up. Iron deficiency in pregnancy has been reported to cause cognitive function and learning disorders in the fetus even in the absence of anaemia. Ferritin deficiency is also important in this respect (25,26). In our study, no relation was found between ferritin deficiency and age, educational status, number of pregnancies, nutrition and planning status of pregnancy. Therefore, ferritin deficiency may be due to the fact that the drugs given to pregnant women for iron supplementation have not been provided or used regularly recently. In the study of Sayar et al. a difference was found between pregnant women who used iron preparations regularly and pregnant women who used iron preparations irregularly or did not use iron preparations in terms of ferritin levels (22). In addition, other factors that may affect ferritin deficiency should be investigated. However, firstly, it should be investigated whether the drugs given within the scope of the Ministry of Health application are provided regularly or used regularly. However, iron supplementation given to pregnant women with normal iron levels may lead to Fenton reaction, formation of free oxygen radicals and precipitation of iron into tissues (14,27). In order to avoid these adverse effects and for early diagnosis of anaemia, monitoring of ferritin levels in pregnant women should be given importance.

Vitamin B12 deficiency is a common cause of anaemia in pregnant women. The most important function of vitamin B12 is to synthesise DNA which is necessary for cell division and proliferation. Vitamin B12 deficiency in the mother is important in terms of causing maternal anaemia as well as affecting the baby. Newborns whose mothers have vitamin B12 deficiency are born with low vitamin B12 stores and are at risk of megaloblastic anaemia, delayed neuromotor maturation and growth retardation (22,28). Vitamin B12 deficiency is observed between 10% and 30% in the world. B12 deficiency is more common in pregnant women (29). In our study, the mean B12 level was 221.11±90.76. Pregnant women with low vitamin B12 were found to be 20.9%. In the study by Sayar et al. vitamin B12 deficiency was found in 90.4% of pregnant women (22). While the rate of pregnant women with B12 deficiency in our study was compatible with the prevalence in the world, it was found to be lower than the study of Sayar et al. The study of Sayar et al. may have been high because it was conducted with term pregnant women who presented to the gynaecology and obstetrics clinic for delivery. According to our study findings, B12 deficiency was associated with age and number of pregnancies. As a result of LR analysis, the risk of B12 deficiency increased in the 25-34 age group and with increasing number of pregnancies. In a study conducted in Şanlıurfa, no relation was found between age and number of births and B12 deficiency, which is different from our study (24). In our study, although B12 deficiency and pregnancy planning status were found to be significant in univariate analysis, it was concluded that it did not cause an increased risk in multivariate analysis. Since vitamin B12 cannot be made in the human body, it should be taken from outside through diet. Vitamin B12 is found in foods of animal origin. Since it is found very little in vegetables, B12 deficiency due to inadequate intake is common, especially in those who are fed a vegetarian diet. Dietary habits are one of the most important factors determining whether vitamin B12 deficiency is present or not (30,31). Failure to make changes in dietary habits in consideration of vitamin B12 even if the pregnancy is planned may be the reason for the lack of difference with unplanned pregnancies.

4.1. Limitations of the study

The study was conducted in a family health centre in Kütahya and in a small number of pregnant women. Therefore, it is not representative of Kütahya and Türkiye. In this retrospective study using records, factors that may cause anaemia, vitamin B12 deficiency in pregnant women such as nutrition and medication habits could not be evaluated because they were not recorded.

5. Conclusions

It has been found that low ferritin is still a serious and common health problem in pregnant women in our study group. Although not as common as low ferritin levels, low B12 levels are also frequently encountered in our study group. However, the results of the study can only be generalised to the family health centre. In this retrospective study using records, factors that may cause anaemia and vitamin B12 deficiency in pregnant women such as nutrition and medication habits could not be evaluated. According to the data we evaluated; B12 deficiency is more common in pregnant women aged 25-34 years and in women with more than one pregnancy. As the number of pregnancies increases, the likelihood of low B12 levels increases.

The causes of anaemia, low ferritin and vitamin B12 deficiency in pregnant women included in the study despite the routine free distribution of iron and vitamin preparations during pregnancy should be investigated. In addition, it may be recommended to investigate the prevalence of anaemia, low ferritin levels and vitamin B12 deficiency in a sample representative of Kütahya and whether the distributed preparations are used correctly and regularly by pregnant women

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Research Article

Relationship Between Fluid Control and Symptom Severity in Hemodialysis Patients

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Abstract

Objective: This study was conducted to determine fluid control and symptom severity in hemodialysis patients, to reveal related factors, and to determine the relationship between fluid control and symptom severity.

Methods: The descriptive and correlational study was conducted with 150 patients receiving treatment in a private hemodialysis center in Istanbul between 01-30 April 2022. Data were obtained using a patient identification form, the Fluid Control Scale in Hemodialysis Patients and the Dialysis Symptom Index.

Results: The mean Fluid Control Scale in Hemodialysis Patients score of the patients was 50.75±8.13. The mean Dialysis Symptom Index score of the patients was 19.09±17.08. In addition, it was found that there was a weak negative correlation between the mean scores of the Fluid Control Scale in Hemodialysis Patients and the Dialysis Symptom Index ($r=-0.349$; $p<0.05$).

Conclusion: It has been determined that the fluid control of hemodialysis patients is generally at a moderate level, the symptom severity is quite low, and the symptom level may decrease as the level of knowledge, behavior, and attitude toward fluid control increases. It is recommended that nurses should regularly educate and counsel hemodialysis patients about the importance of fluid control and closely monitor the patient's compliance with fluid control.

Keywords: Hemodialysis, Fluid control, Symptom severity, Nursing care

1. Introduction

Hemodialysis (HD) is the most preferred renal replacement treatment method, which allows the removal of toxic substances accumulated in the body due to end-stage renal failure and waste products resulting from metabolism and is based on the rules of physics (1). HD has advantages such as being easily accessible through health institutions, being administered by a health professional, and prolonging life (2). However, HD treatment also has various disadvantages in terms of requiring compliance with fluid and nutrition, causing loss of time and labor, performing invasive procedures in each HD session, and requiring surgical procedures for arteriovenous fistula or other intervention methods (3). Successful management of the HD treatment process is very important in improving the quality of life by reducing the morbidity and mortality rate in end-stage renal failure. The success of HD treatment; Patients' compliance with diet and fluid restriction, regular use of their medications, uninterrupted health checks and laboratory tests, and effective ultrafiltration (UF) have a significant impact (4).

Patients receiving HD treatment experience a wide range of symptoms such as constipation, diarrhea, nausea, loss of appetite, muscle contraction, edema, dyspnea, fatigue, insomnia, pain in bones or joints, dry skin, itching, and sexual dysfunction due to uremia caused by chronic renal failure. (5). HD treatment aims to prevent the development of uremic symptoms, fluid accumulation, fluid-electrolyte, and acid-

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base balance disorders in the patient (6). In the effective management of the treatment process, patients' compliance with the treatment must be high (7).

The issue that HD patients experience the most stress and difficulty in adapting to treatment is fluid restriction (8). Fluid control in HD patients depends on the balance between daily sodium intake, fluid intake, urine output, and the amount of UF in dialysis sessions. HD patients are recommended to drink fluids at a rate of urinary volume + 500 mL/day (9). Due to increased fluid in patients, symptom burden, morbidity, and mortality rates increase. If the patient complies with the treatment and pays attention to fluid restriction, complications can decrease and quality of life can increase (10). It is stated in the literature that if interdialytic weight gain is not taken into consideration, complications and mortality rates such as hypertension, hypotension, muscle cramps, congestive heart failure, and ascites are high (11). In a study conducted by Kaplan and Karadağ (2022), it was found that symptoms were less in HD patients with high compliance with fluid control (12). In the study of Atik et al. (2020), it was found that patients experiencing symptoms of fatigue and decreased energy had poor fluid control (13). In another study, it was determined that the level of depression could decrease with compliance with fluid therapy (11). Therefore, maintaining fluid control in HD patients is of vital importance.

A multidisciplinary team approach is very important in the compliance of HD patients with treatment. Nurses who have direct communication with the patient have important roles in this team. Nurses' diagnosis of symptoms in HD patients, planning nursing interventions, and planning and implementing effective nursing interventions during complications contribute positively to the treatment (14). Additionally, nurses need to evaluate the treatment compliance process in HD patients. This study was conducted to determine fluid control and symptom severity in HD patients and to determine the relationship between fluid control and symptom severity. It is anticipated that the findings obtained in the study will guide nursing interventions on symptom management in HD patients and contribute to the literature.

Questions of study:

- What is the level of fluid control in HD patients?
- What is the level of symptom severity in HD patients?
- Is there a relationship between fluid control and symptom severity in HD patients?

2. Methods

2.1. Type, population, and sample of study

The study was conducted in a descriptive and relationship-seeking type. The population of the study consisted of patients who received HD treatment at a private dialysis center in Istanbul between 01-30 April 2022. The number of HD patients registered in this center, including acute/chronic, and guest/permanent, is 324. The annual average number of registered patients is 279. The study was conducted with 150 patients who met the inclusion criteria. To determine the reliable adequacy of the sample size, power analysis was performed using the G-Power 3.1 program. In the power analysis, it was determined that at the 0.05 significance level, the effect size was 0.80 and the power was 95%. The obtained values show that the number of samples is sufficient (12).

Inclusion criteria;

• Volunteering to participate in the study,
• Being 18 years or older,
• Having no problems with hearing, reading, and understanding,
• Having the cognitive competence to answer study questions.

2.2. Data collection tools

The study data were obtained using the patient diagnosis form, Fluid Control Scale in Hemodialysis Patients (FCSHP), and Dialysis Symptom Index (DSI).

Patient diagnosis form: The form was prepared by the researchers in light of the literature (2,4,11,16) and consists of 11 questions regarding the sociodemographic characteristics of the patients and 17 questions regarding the disease and treatment characteristics.

Dialysis Symptom Scale: The scale was developed by Weisbord et al. in 2005 from the short form of the Memorial Symptom Diagnostic Scale to measure the physical and emotional symptoms encountered by HD patients and the severity of these symptoms. The validity and reliability of DSI Turkish was made by Foreword and Master Yeşilbakan in 2013. DSI includes 30 physical and emotional symptoms. Patients are asked to answer yes or no to the symptoms they have experienced during the last week, and if yes, to evaluate the severity. Severity assessment is scored on a 5-point Likert scale, with 0 = not at all and 4 = very much. The scale score is determined by adding up the scores obtained from the results. The score range varies between 0-150, and it is seen that the severity of symptoms increases as the score increases. In the Turkish validity and reliability study of the scale, Cronbach's alpha coefficient was determined as 0.83 (15). In this study, the Cronbach's alpha value of the scale was found to be 0.87.

Fluid Control Scale in Hemodialysis Patients: The scale was developed by Coşar and Pakyüz in 2012 to measure the knowledge, attitude, and behavior about fluid restriction in HD patients. The scale is a 3-point Likert type and consists of 24 items. The scale has three sub-dimensions: knowledge, behavior, and attitude. Nine items on the scale are scored in the reverse direction. Scores between 7-21 can be obtained from the knowledge sub-dimension of the scale, scores between 11-33 from the behavior sub-dimension, scores between 6-18 from the attitude sub-dimension, and scores between 24-72 from the general sub-dimension. As the score obtained from the scale increases, fluid control compliance also increases. In the development study of the scale, the overall Cronbach alpha value was 0.88, the knowledge sub-dimension was 0.92, the behavior sub-dimension was 0.80, and the attitude sub-dimension was 0.67 (17). In this study, Cronbach's alpha coefficient for the overall scale was found to be 0.78, 0.78 in the knowledge sub-dimension, 0.77 in the behavior sub-dimension, and 0.83 in the attitude sub-dimension.

2.3. Statistical analysis

The data obtained in the study were analyzed in a computerized environment with the SPSS 25.00 package program. While investigating whether the variables came from a normal distribution, the Kolmogorov-Smirnov test was used due to the number of units. In addition to descriptive statistics, the Spearman Correlation test was applied when examining the relationship between scales because they did not come from a normal distribution. $P<0.05$ was used as the significance level when interpreting the results.

2.4. Ethical dimension and implementation of study

To collect data in the study, written approval was obtained from the ethics committee of a university (date 24.02.2022, number 2022/ 02) and from the institution where the study was conducted (Approval date: 16/03/2022). The participants were informed about the purpose of the study, its plan, and where the data would be used, and the principle of "Respect for Human Dignity" was fulfilled voluntarily, the principle of "Respect for Autonomy" was fulfilled, and the principles of "Confidentiality and Protection of Confidentiality" were fulfilled by keeping the data confidential. Written permission was obtained from the participants by filling out an informed consent form. Data were collected by face-to-face

interview method. Information regarding the disease and metabolic parameters was obtained from the patient's file with his/her consent. Data collection took approximately 20-25 minutes.

3. Results

According to the study, 32% of the patients were over 65 years old, 76.7% were male, and 47.3% had completed primary school. The study also found that 78.7% of the patients were married, 91.3% were unemployed, and 69.3% had an income equal to their expenses. In terms of their general health status, 62.7% of the patients reported it as good. Lastly, 23.3% of the participants were smokers at the time of the study (Table 1).

Table 1. Distribution of Patients' Personal Characteristics (N=150)

Characteristics		**n**	**%**
Age	Under 65 years	102	68.0
	Over 65 years	48	32.0
Gender	Female	35	23.3
	Male	115	76.7
Education status	Not illiterate	5	3.3
	Primary school	71	47.3
	Middle school	32	21.3
	High school	22	14.7
	Licence	20	13.3
Marital status	Married	118	78.7
	Single	32	21.3
Working status	Yes	13	8.7
	No	137	91.3
Income status	Income exceeds expenses	24	16.0
	Income equals expenses	104	69.3
	Income is less than expenses	22	14.7
Place of residence	City center	149	99.3
	Town	1	0.7
Living status	Alone	10	6.7
	With family	140	93.3
Smoking status	Yes	35	23.3
	Left	74	49.3
	Never	41	27.3
Ability to perform daily living activities	Can do it alone	142	94.7
	Can do it with help	8	5.3

The average duration of kidney disease diagnosis of the participants was 99.87±81.73 months and the average duration of HD treatment was 67.23±56.85 months. It was determined that 21.3% of the patients started HD treatment due to chronic glomerulonephritis, and 12.7% had another chronic disease other than renal failure for which they were treated (Table 2).

The total score average of the patients on FCSHP is 50.75±8.13. When the sub-dimensions are examined, the total average score of the knowledge level is 17.93±2.06, and the average total score of the behavioral level is 22.75±5.64. The average total score of the attitude level is 10.06±3.82. The mean DSI total score of the patients is 19.09±17.08 (Table 3).

Table 2. Distribution of Patients' Disease-Related Characteristics (N=150)

Characteristics		n	%
Kidney disease duration (months)	99.87±81.73		
HD treatment duration (months)	67.23±56.85		
Disease causing kidney failure	Unknown	24	16.0
	Chronic Glomerulonephritis	32	21.3
	Diabetes Mellitus	29	19.3
	Hypertension	48	32.0
	Polycystic Kidney	17	11.3
Time to start HD treatment after diagnosis of disease	Within the first month	76	50.7
	One month later	74	49.3
Number of HD treatment days per week	Two times	28	18.7
	Three times	121	80.7
	Four times	1	0.7
HD treatment duration	3.5 hours	2	1.3
	4 hours	148	98.7
Transplantation history	Failed transplantation	8	5.3
	Waiting for transplantation	106	70.7
	Not planning transplantation	36	24.0
The presence of another member of the family receiving HD treatment	Yes	17	11.3
	No	133	88.7
Status of receiving education about her disease	Yes	142	94.7
	No	8	5.3
Person providing training	Health working	127	89.4
	Friend/neighbor	12	8.4
	Press-publication	3	2.1
Going for health check-up	Regular	138	92.0
	Irregular	9	6.0
	Irregular, family difficult	3	2.0
Having routine checks such as blood tests and blood pressure measurements	If his/her doctor wishes, he/she can have them all done completely.	126	84.0
	Even though his/her doctor wants him/her to do it, he/she won't do it.	21	14.0
	Even if your doctor requests it, if you have no complaints, you won't have it done.	3	2.0
Medication use status in the management of the disease	Organized	142	94.7
	Irregular, whenever you think of it	4	2.7
	Irregular, lots of complaints	2	1.3
	Does not administer medication	2	1.3
Diet application status regarding the management of the disease	Irregular, whenever you think of it	110	73.3
	Irregular, whenever you think of it	27	18.0
	Irregular, lots of complaints	8	5.3
	Does not follow a diet	5	3.3

Table 3. Distribution of Patients' FCSHP and DSI Average Scores

Scales	Mean±SD	Min	Max
FCSHP			
Knowledge	17.93±2.06	10.00	21.00
Behavior	22.75±5.64	11.00	33.00
Attitude	10.06±3.82	6.00	18.00
General	50.75±8.13	30.00	67.00
DSI	19.09±17.08	0.00	84.00

In the study, a statistically significant relationship was determined between the FCSHP knowledge, behavior, and attitude sub-dimension of the patients and the general scale score average and DSI score average ($p<0.05$). The relationship between them has a weak reverse strength ($r=-0.266$; $p<0.05$). As the level of fluid control knowledge, behavior, and attitude increases, the symptom level decreases (Table 4).

Table 4. Comparison of Patients' FCSHP and DSI Score Averages

FCSHP	Test	DSI
Knowledge	r	-0.266
	p	**0.001**
Behavior	r	-0.210
	p	**0.010**
Attitude	r	-0.259
	p	**0.001**
General	r	-0.349
	p	**<0.001**

r= Spearman Correlation analysis

4. Discussion

Despite the developments in HD treatment, the increase in the quality of the materials used, and the equipment of the service group increasing day by day, mortality rates are still very high. Patients' compliance with their diet and fluid restriction, regular use of their medications, and effective UF affect the success of HD treatment (8). In this study, it was determined that the fluid control level of the patients was at a moderate level. Different findings were obtained in studies with similar scales in the literature. Consistent with this study, it was emphasized in the study by Karabulutlu and Yılmaz (2019) that the fluid control level was moderate (16). In a study by Kulaksız and Arslan (2018), it was determined that the fluid control level was above average (18). However, in the study of Kaplan and Karadağ (2022) and the study of Balım and Pakyüz (2016), it was stated that the level of fluid control was low (12,19). The finding obtained in this study shows that although the rate of patients receiving education about the disease is high, compliance with fluid control is not at the desired level. This may be due to the patient's perspective on the disease and the failure to create living conditions that would support adaptation to the disease.

In the study, it was determined that the level of knowledge in fluid control was high. Similarly, in the study of Karabulutlu and Yılmaz (2019) and Özkan et al. (2019), it was observed that fluid control knowledge was at a high level in HD patients (16,20). Despite this, in Balım and Pakyüz's (2016) study, it was observed that the level of knowledge was low (19). It is thought that the different results obtained from the studies are due to the difference in the education levels of the patients and the fact that the studies were conducted in different geographical regions.

In the study, it was found that the fluid control behavior level was at a moderate level. The study finding is similar to the study of Kaplan and Karadağ (2022), Karabulutlu and Yılmaz (2019), and Balım and Pakyüz (2016) (12,16,19). In this study, it is thought-provoking that although the patients' knowledge about fluid control was high, their behavioral level was low. This finding may be due to patients not being aware of the importance of fluid control.

In the study, it was found that the fluid control attitude level was low. The study findings are parallel to the literature. The attitude level was also evaluated as low in the studies of Kaplan and Karadağ (2022), Karabulutlu and Yılmaz (2019), and Özkan et al. (2019) (12,16,20). Although patients' knowledge levels regarding fluid control are high, their attitude levels are low, which may be related to their acceptance of the disease. Similarly, patients' attitudes towards fluid control may be negatively affected by reasons such as difficulty in fluid control and boredom with fluid control.

In the study, it was found that the symptom severity of the patients was quite low. In the literature, it is seen that the severity of symptoms assessed by DSI varies in HD patients. In the study of Yılmaz et al. (2020), it was reported that the symptom severity of the patients was low (1). In the studies of Dikmen and Aslan (2020), Akgöz et al. (2017) and Demiroğlu and Bülbül (2021), the symptoms were found to be of moderate severity (21-23). In Zamanian et al.'s (2014) study, it was stated that symptom severity was high (24). In this study, although the symptom severity should be low, it is thought that this may be due to the long duration of the disease and the duration of HD.

The number and severity of symptoms increase in patients who do not comply with a liquid diet. Excess fluid that cannot be removed from the individual's body affects the quality of life and increases the mortality and mortality rate (7). In the study, it was determined that there was a weak negative relationship between the level of knowledge, behavior, and attitude of the patients toward fluid control and the level of symptoms. Accordingly, as patients' fluid control levels in knowledge, behavior, and attitude increase, dialysis symptom levels may decrease. In the literature, Kurt et al.'s (2011) study stated that complications such as pulmonary edema, hypertension, and cardiovascular complications due to fluid load in the body are frequently experienced in patients who do not comply with fluid control. In the same study, it was emphasized that symptoms such as edema, dyspnea, headache, chest pain, and numbness in the feet were frequently observed in patients due to fluid overload (25). In a study by Atik et al. (2020), it was stated that headache symptoms were frequently encountered in patients without fluid control, and symptoms of loss of appetite and anxiety were observed when patients did not control their fluid consumption (13). In some studies, the amount of intradialytic fluid in patients who do not maintain fluid control increases, resulting in nausea, vomiting, cramps, hypotension, etc. It has been emphasized that it may increase the severity of symptoms (19,26). The study finding, which is consistent with the literature, emphasizes the importance of fluid control in reducing symptom severity in HD patients.

5. Conclusions and Recommendations

In this study, HD patients had moderate fluid control; It was determined that the symptom severity was low. Additionally, it has been determined that the symptom level may decrease as the level of knowledge, behavior, and attitude toward fluid control increases. In line with these findings, it is recommended that HD patients and their relatives be educated and counseled about the importance of fluid control in symptom management at regular intervals. Additionally, applications that will support fluid control in HD patients, such as taking notes and filling out charts, can be developed and taught to patients. In each HD session, patients' compliance with fluid controls should be evaluated with applications such as charts and tables to support fluid compliance. In addition, it is recommended to conduct qualitative studies on the variables that support and hinder compliance with fluid control in HD patients.

Limitations

The study contains several limitations. First, the study was conducted in a single center and over a specific period, so the findings cannot be generalized. In addition, the patient's symptom level and compliance with the fluid control level were evaluated with the HHSKS and DSI, and these data forms were filled out based on the patient's self-report. However, variables that would affect fluid restriction or symptom level were not excluded from the study. Despite these limitations, our study provides important data to support disease management in HD patients.

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Spinal Kord Yaralanması Olan Hastalarda Fiziksel Engelliler İçin Fiziksel Aktivite Ölçeği'nin (FEFA) Geçerlik ve Güvenilirliği

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Holistik sağlık dergisinin Cilt 6 sayı 3'te yayınlanan makalemizin giriş bölümünün son paragrafı aşağıdaki şekilde düzenlenmiştir. Değerli okuyuculara saygılarımızla sunarız.

"Ülkemizde SKY'li hastalarda Türkçe geçerlik ve güvenirlilik çalışması yapılmıştır (12). SKY li hastalarda fiziksel aktiviteye katılım için üst ekstremite motor fonksiyonları önem arz etmektedir. Çalışmamızda da üst ekstremite etkilenimi olan servikal bölge yaralamalı hasta ağırlıklı olarak yapılması amaçlanmıştır."

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Review

Nonpharmacologic Methods Used in the Management of Premenstrual Syndrome: A Systematic Review of Randomized Controlled Postgraduate Theses

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Abstract

Objective: The aim of this study is to examine the randomized controlled postgraduate nursing theses on nonpharmacological applications used in the management of premenstrual symptoms.

Method: In this systematic review, theses registered to the National Thesis Center were searched between October 2022 and November 2022 using the keywords "PMS", "premenstrual syndrome" and/or "premenstrual syndrome". As a result of the search, 130 studies were found and 4 randomized controlled dissertations meeting the inclusion criteria were included in the study.

Results: The included studies were sorted and analyzed according to years, and numerical analyzes were carried out in computer environment. Results of the interventions used in the study, Premenstrual Syndrome Scale (PMSS), Depression Anxiety Stress Scale (DASS), Visual Pain Scale (VAS), Menstrual Distress Complaint List, Perceived Stress Scale, World Health Organization Quality of Life Assessment Scale Short Form, Menstrual Distress Complaint List was evaluated using the WHO Short Form of the Quality of Life Scale (WHO-SF) and the Healthy Lifestyle Behaviors Scale (SYBDS II).

Conclusion: The theses in the study showed that aromatherapy, health-related education models, the use of health belief models and acupressure were effective in alleviating PMS symptoms.

Keywords: PMS, Premenstrual syndrome, Nonpharmacological methods, Randomized controlled, Postgraduate thesis

1. Introduction

Premenstrual syndrome (PMS) is characterized by significant somatic and psychological symptoms that occur at the beginning of the luteal phase of the menstrual cycle and end with menstruation, and is frequently experienced by millions of women of reproductive age worldwide (1,2). The American College of Obstetrics and Gynecology (ACOG) defined premenstrual syndrome (PMS) as a clinical condition characterized by the cyclical occurrence of physical and emotional symptoms that are not associated with any structural disorder, starting within five days before menstruation and ending by the fourth day of menstruation (3). The global prevalence of this syndrome is 47.8% worldwide (2). Among them, about 20% of women experience symptoms severe enough to interfere with their daily activities and the rest have mild to moderate symptoms. Symptoms of PMS include changes in appetite, weight gain, complaints of pain in the abdomen, lower back and head, breast swelling and tenderness, nausea, constipation, anxiety, irritability, anger, fatigue, restlessness, mood swings and crying (4). Although the pathophysiology of premenstrual syndrome has not been clearly explained, it is believed to be triggered by hormonal changes after ovulation (5-7). PMS is likely to be affected by the effect of progesterone on neurotransmitters such as gamma-aminobutyric acid (GABA), opioids, serotonin and catecholamine. Increased sensitivity to progesterone and pre-existing serotonin deficiency are also thought to be

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responsible for this disorder. Increased prolactin levels or increased sensitivity to prolactin action, changes in glucose metabolism, abnormal hypothalamic-pituitary-adrenal (HPA) axis function, insulin resistance and some nutritional electrolyte deficiencies and genetic factors have a role in PMS. Stress causes dysmenorrhea by increasing sympathetic activity and thus uterine contractions (6,7). Premenstrual syndrome is managed with nonpharmacologic, pharmacologic and surgical therapies. In the first stage, the condition should be managed with nonpharmacologic treatments. Nonpharmacologic treatments consist of pharmacologic and non-surgical applications such as exercise, reflexology, vitamin preparations, aromatherapy and herbal products (8). These methods are more reliable and have fewer complications compared to pharmacologic and surgical treatments (9). International literature suggests that nonpharmacologic treatments are an effective way to improve PMS symptoms method in the treatment of PMS. In a randomized controlled trial conducted by Heidari et al. in which participants received vitamin D or placebo every two weeks for four months, a significant improvement in PMS symptoms was shown (10). In a meta-analysis examining the effect of yoga on PMS, it was concluded that yoga reduced PMS (11). In a meta-analysis examining the effect of electroacupuncture on PMS, acupuncture was found to significantly reduce PMS (12). Another study investigated turmeric and PMS and found that turmeric reduced symptoms (13). Studies examining psychosocial interventions with PMS also reported that they were effective in reducing PMS symptoms (14,15). It is important to enrich studies on the subject, to provide evidence-based practices and to educate nurses about the subject. It is essential to increase the number of randomized controlled studies to ensure evidence-based practices. Therefore, our aim in this study was to examine the postgraduate theses in Turkey that conducted randomized controlled studies of nonpharmacological applications used in the management of premenstrual syndrome in the field of nursing and to guide nursing practices and contribute to the literature by evaluating the results.

2. Methods

This study is a systematic review and was conducted to examine the findings of randomized controlled postgraduate theses on PMS in the field of nursing between 2000 and 2022. In the first phase of the study "Premenstrual syndrome", "PMS", "premenstrual syndrome" keywords and literature search was conducted with the Higher Education Council (YÖK) National Thesis Center Database. This phase was carried out between October 2022 and November 2022. As a result of the search, 130 studies were found. After the studies were examined by the researchers, it was seen that only 47 of the 130 studies were postgraduate theses in the field of nursing. Seven of these 45 studies were experimental type studies. After examining the seven studies, it was seen that 6 studies were randomized control studies. After re-evaluating the six studies, two of them were found to be studies on perimenstrual distress and were excluded from the study. The study was conducted with four randomized controlled trials. The included studies were sorted and examined according to years and their numerical analysis was performed in a computer environment. After the evaluations, the studies were summarized in a table as thesis title, year, thesis type, intervention, sample size, data collection tools and results.
Since this study was a literature review, ethics committee permission was not required.
Inclusion criteria;
-In the YÖK National Thesis Center Database, the following theses were included: Department of Nursing, Department of Women's Health and Diseases Nursing, Department of Obstetrics and Gynecology Nursing
-Published between 2000 and 2022
-The keywords PMS, premenstrual syndrome, premenstrual syndrome are included in the thesis,
-Which is a randomized controlled experimental study,
Graduate theses for which the full text was available were included in the study.

3. Results

As a result of this systematic literature review, it was found that there were four postgraduate theses on PMS between 2000 and 2022 in the Department of Nursing, Department of Women's Health and Diseases Nursing, Department of Obstetrics and Gynecology Nursing. It was observed that 75% of the theses were doctoral dissertations (Table 1).

Table 1. Distribution of Theses According to Types

Thesis Type	n	%
Master's Degree	1	25
PhD	3	75

Although the first thesis on the subject was conducted in 2008, it is seen that the studies intensified after 2016 (Table 2).

Table 2. Distribution of the Theses Analyzed According to Years

Year of publicatio	2016	2017	2018	2022
Number of thesis	1	1	1	1
%	%25	%25	%25	%25

The studies were conducted in different sample groups such as university students, individuals with PMS risk behaviors, and individuals applying to Family Health Center (FHC). The studies were conducted by applying reflexology, yoga, aromatherapy, training based on the Health Belief Model (HIM) + acupressure and healthy lifestyle behaviors training interventions. The results of the interventions used in the study were evaluated through the Premenstrual Syndrome Scale (PMSS), Depression Anxiety Stress Scale (DASS), Visual Pain Scale, Menstrual Distress Complaint List, Perceived Stress Scale, World Health Organization Quality of Life Assessment Scale Short Form (WHOQOL-SF), Menstrual Distress Complaint List (SUS) and Healthy Lifestyle Behaviors Scale (HLSBS II). The author, year of publication, purpose, study group, study type, measurement tool used, sample size and results of the postgraduate theses are summarized in Table 3 (Table 3)

Table 3. Information on Graduate Theses

Author/Year	Title	Objective	The group to which the study was applied	Sample size	Intervention	Measurement tool used	Conclusion
Tuğba UZUN ÇAKMAK, 2016[16]	The effect of aromatherapy on coping with premenstrual syndrome in university students	Studying the effect of aromatherapy on PMS	Students with PMS staying in university dormitories	Experiment:40 Control:37	Aromatherapy	PMSS	Inhalation aromatherapy has been found to be effective in coping with PMS, reducing anxiety, depressive affect, fatigue, irritability, pain, bloating, depressive thoughts
Nazife BAKIR,2017[17]	The effect of healthy lifestyle behaviors training in university students with premenstrual complaints	Investigation of the effect of healthy lifestyle behaviors training given to individuals with PMS risk factors on PMS symptoms and healthy lifestyle behaviors	Health Services Female students studying at the Vocational School	Experiment:77 Control: 78	Healthy lifestyle behaviors training	DASS PMSS HLSBS II	It was found that healthy lifestyle behaviors training improved health behaviors, was effective in reducing risk factors for premenstrual complaints and decreased premenstrual complaints.
Didem ŞİMŞEK KÜÇÜKKELEPÇE, 2018 [18]	The effect of acupressure and training on premenstrual symptoms and quality of life under the guidance of the Health Belief Model for coping with premenstrual syndrome	The effect of health belief model-based education and acupressure on premenstrual symptoms and quality of life	All women with PMS registered at ASMs in a specific region in Adıyaman province center	51 education + acupressure 55 training, 57 control group	Training based on health belief model+acupressure	PMSS WHOQOL-SF	PMS symptoms decreased and quality of life improved after training and acupressure. It was also found that education and education + acupressure had a similar effect on PMS.
Ece ÖZKARADİĞİN,2022 [19]	Evaluation of the effectiveness of web-based education on premenstrual syndrome (PMS) symptoms and quality of life	Examining the effectiveness of web-based education on PMS symptoms and quality of life	University students with PMS	Experiment:33 Control:33	Web-based education	PMSS, SUS	Web-based training was found to be effective in reducing PMS symptoms and improving quality of life.

4. Discussion

Complications and costs of pharmacologic and surgical treatments in the management of premenstrual syndromes have made nonpharmacologic methods more reliable and advantageous. The fact that nonpharmacologic applications are frequently preferred options has led to the need for studies in the nursing profession. In our study, postgraduate theses on the subject in the field of nursing in Turkey were examined. Uzunçakmak (2016) looked at the relationship between aromatherapy and PMS symptoms in her thesis and found that inhalation aromatherapy via lavender oil was effective in the management of PMS and also reduced symptoms of fatigue, bloating, exhaustion, depression, anxiety, irritable mood, pain (16). Heydari et al. in 2016, 31 control subjects in Iran 33 intervention group, it was reported that psychological ($p < 0.001$), physical, social and total PMS scores of the aromatherapy group using essential oils of Rosa damascena decreased, while no change was observed in the control group (20). In a single-blind randomized controlled study conducted by Matsumoto et al. in Japan in 2016 with aromatherapy groups and placebo groups, it was reported that tension-anxiety, anger-hostility and fatigue decreased in aromatherapy groups, but no change was observed in other symptoms (21). Lotfipur- Rafsanjani et al. (2018) found that aromatherapy massage significantly reduced PMS physical and mental symptoms compared to massage therapy (22). The findings in Uzunçakmak's thesis are in line with the literature and show that aromatherapy is an effective method for managing PMS symptoms. Şimşek Küçükkelepçe (2018) found in her thesis that the training and acupressure intervention given to women with PMS using the health belief model reduced PMS complaints. It is also stated that education and acupressure practices have similar effects (18). When randomized controlled studies examining the effect of acupressure on PMS were examined, 97 students diagnosed with PMS were divided into 3 groups as LIV3, LI4 acupuncture and placebo points in a single-blind randomized study and it was shown that application of simple acupressure protocol in LIV3 and LI4 led to a decrease in PMS symptoms, depression and anxiety severity and improvement in quality of life. In addition, pressure in LIV3 and LI4 was found to be equally effective (23).

In a randomized controlled study examining the effectiveness of acupressure and reflexology on PMS, it was found that both methods reduced the severity of PMS, but reflexology was found to be the more effective method (24). Studies show that acupressure is effective on PMS symptoms.

In her thesis, Bakır (2017) provided training based on healthy lifestyle behaviors to university students with PMS complaints and found that after the training, the health behaviors of the students improved and there was a decrease in PMS complaints by reducing the risk factors causing premenstrual complaints (17). Özkaradiğin (2022) found that PMS symptoms decreased and quality of life increased in university students with PMS who were given web-based training prepared with reference to the Premenstrual Syndrome Management Guide and evidence-based practices for the management of PMS (19). Şimşek Küçükkelepçe (2018) also found that training based on the health belief model reduced PMS complaints (18). The findings of the study are in parallel with the findings of other studies on the subject. In a randomized controlled study investigating the effectiveness of a health belief model-based health education program on PMS in late adolescence, health belief model-based education was found to be effective in coping with PMS (25). In Pondicherry, a significant decrease was found in total PMS and all subscale scores three months after the health education given to secondary school students with PMS compared to the pre-training period (26). It was found that there was a significant decrease in PMS severity of students after the training program applied to nursing college students (27). Shakiba et al. also found that dysmenorrhea decreased after an educational intervention based on the health belief model applied to hospital staff experiencing PMS (28). In the study of Khalilipour Darestani et al. (2017), it was reported that the implementation of education based on the health belief model was effective in the adoption of PMS preventive behaviors (29). The results of the postgraduate theses included in our study are similar to the results of the literature and show that education reduces PMS complaints and

facilitates coping with PMS and has a positive effect on PMS by ensuring the adoption of preventive behaviors.

5. Conclusion

The theses in our study showed that aromatherapy, health-related education models, use of health belief models and acupressure were effective in alleviating PMS symptoms. These nonpharmacological interventions have become popular in the management of PMS over the last decade and hold significant promise for other areas of human health.

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