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Medical and Socio-Psychological Consequences of the COVID-19 Pandemic on People with Congenital Bleeding Disorders and Their Caregivers

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ABSTRACT

Objective: This study aimed to reveal the effects of the COVID-19 pandemic on congenital bleeding disorders (CBDs) patients and the hematology specialists following them.
Material and Methods: CBDs patients with and without a history of COVID-19 being followed up at the oncology institute of a university hospital were considered one study group (71 patients), and hematology specialists from Turkey were considered a separate study group (35 physicians). Data were collected using two questionnaires during face-to-face interviews.
Results: During the pandemic, it was found that 29.3% of COVID-19-positive patients and 50% of COVID-19-negative patients had various degrees of bleeding (p=0.023). It was observed that the data on increase in bleeding, switching to treatment when bleeding, and decrease in mobilization were more negative in patients who were not diagnosed with COVID-19 compared to those who were diagnosed with COVID-19. No difference was found between the two groups in terms of having problems accessing the product used in treatment. More than half of the patients with CBDs expressed high levels of pandemic-related anxiety for themselves and their relatives.
Of the physicians, 34.3% stated they were highly concerned about the patients they followed during the pandemic. Physicians with more professional experience also had higher levels of anxiety about COVID-19.
Conclusion: Our study shows that the COVID-19 pandemic has caused mental health problems not only among patients with chronic health problems but also among healthcare workers who are fighting the pandemic on the frontlines.
Keywords: COVID-19, hemophilia, blood coagulation disorders, patient health questionnaire

INTRODUCTION

Severe Acute Respiratory Syndrome Coronavirus 2 (SARSCoV-2), which emerged in Wuhan, China in late 2019, has spread rapidly, leading to the Coronavirus Disease 2019 (COVID-19) pandemic. While the most common clinical findings are influenza-like symptoms, 15% to 20% of patients, in particular those with advanced age and comorbidities, develop severe interstitial pneumonia and respiratory failure, which may result in death and require intensive care and mechanical ventilation (1,2).

For the past two years, an unprecedented global health crisis has been ongoing, affecting patients, doctors, and other health professionals, causing changes in attitudes and behaviors. In addition, many countries are resorting to social isolation as a precautionary measure to combat the pandemic, and there are concerns that these measures may limit access to the usual standard of medical care and create problems with the management of chronic diseases (1,3).

As in other chronic diseases, there are some concerns about the sustainability of treatment management for patients with congenital bleeding disorders (CBDs). These concerns are related

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to therapeutic product supply chains as well as potential negative impacts on patients' medical care and mental health (4,5). The impact of the pandemic and the measures taken on patients with CBDs has yet to be fully established. Recommending healthy practices to patients with congenital bleeding disorders is particularly important to prevent the serious consequences of the COVID-19 pandemic. Similarly, the impact of the pandemic on the physicians who treat patients with CBDs is also an important issue that needs to be addressed.

In this study, we aimed to reveal the effects of the COVID-19 pandemic on patients with CBDs and the adult and/or pediatric hematology specialists who follow them and the resulting changes in attitudes and behaviors.

MATERIAL AND METHODS

This study was planned as a non-interventional, cross-sectional type and was conducted on two different target groups. CBDs patients with and without a history of COVID-19 who were being followed up at the oncology institute of a university hospital were considered as one study group, and adult and/or pediatric hematology specialists from a total of 27 different centers from all 12 regions of Turkey within the scope of NUTS1 were considered as a separate study group. All participants gave informed consent and the study was approved by the by the clinical research ethics committee of a university (18.02.2022-approval no: 750500) in accordance with the Declaration of Helsinki.

Data were collected using two questionnaires for participating patients and physicians during face-to-face interviews. The patient questionnaire included demographic information as well as measurement items (questions) that assessed changes in clinical findings, treatment compliance and practices, and anxiety levels during the COVID-19 pandemic. The questionnaire for physicians included demographic information and items measuring the extent to which they had been affected by the COVID-19 pandemic.

Statistical Analysis

Statistical Package for Social Science; version 21 (SPSS) program was used for data analysis. In descriptive statistics, numerical data were presented as mean and standard deviation, whereas categorical variables were expressed as frequencies and percentages. Differences between subgroups were analyzed by Student's t-test for numerical variables and Chi-square (χ^2) test for categorical variables. Correlation analyses were performed using Spearman (r_s) test. The significance value was considered as $p<0.05$.

RESULTS

Between April 2020 and May 2021, 71 people completed the questionnaires, among whom 41 patients with CBDs, including 40 patients diagnosed with COVID-19 and one exposed, and 30 CBD cases without a diagnosis of COVID-19 (Table 1). The diagnosis was made by PCR test in 31 patients, by clinical findings in nine patients, and by computerized thoracic tomography (CT) in one patient. Patients diagnosed with COVID-19 accounted for 6.3% of the 648 patients with CBDs admitted to our institution. The number of COVID-19 positive people in the data of the Ministry of Health on the same dates was 163.942 and the ratio of this number in the population of Turkey was 0.19% (163.942/85.04 million) (6).

The mean age of patients who were COVID-19 positive was 33.5±15 years and 7.32% of them were female, while the mean age of COVID-19 negative patients was 31.5±9.9 years and all of them were male. Of these patients, 82.5%(n=33) were on clotting factor concentrates (16 for prophylaxis, 17 when bleeding), 7.5%(n=3) were on bypass-acting clotting concentrates (two for prophylaxis, 17 when bleeding) and (n=4) were on fitusiran, which is currently under clinical investigation. Twelve patients with COVID-19 had comorbid conditions. These were diabetes, hypertension, and thyroid disease in three patients each, and obesity, asthma, Familial Mediterranean Fever, intracranial shunt, basal cell carcinoma, heart valve insufficiency, and celiac disease in one patient each. Among COVID-19-negative patients, one had comorbidity (autoimmune thyroiditis).

During the pandemic, it was found that 29.3% of COVID-19-positive patients and 50% of COVID-19-negative patients had various degrees of bleeding due to hemophilia and other CBDs (Table 2). This difference was found to be statistically significant ($p=0.023$; $p<0.05$).

Table 1: Baseline characteristics of COVID-19 positive and negative cases enrolled in the study.

	COVID-19 Positive (+)	COVID-19 Negative (-)	Total
Hemophilia A	21	27	48
• Severe (with inhibitor)	19 (5)	26	45 (5)
• Moderate	2	1	3
Hemophilia B	11	3	14
• Severe	4	3	7
• Moderate	5	-	5
• Mild	2	-	2
vWD	7	-	7
FXI Deficiency	1	-	1
EXPOSED	1	-	1
TOTAL	41	30	71

Table 2: Bleeding status of Congenital Bleeding Disorder cases during the pandemic.

	n	%	n	%
None	29	70.7	15	50.0
Mild bleeding*	4	9.8	3	10.0
Moderate bleeding**	6	14.6	11	36.7
Severe bleeding***	2	4.9	1	3.3
Total	41	100.0	30	100.0

* Severe bleeding with major trauma or surgery; rare spontaneous bleeding; ** Occasional spontaneous bleeding; prolonged bleeding with minor trauma or surgery; *** Mainly spontaneous bleeding into joints or muscles without identifiable hemostatic strain (trauma, surgery, etc.) (19).

Changes in clinical signs and treatment were evaluated and it was observed that the data on increase in bleeding, switching to treatment when bleeding, and decrease in mobilization were more negative in patients who were not diagnosed with COVID-19 compared to those who were diagnosed with COVID-19 ($p \leq 0.05$) (Table 3). No difference was found between the two groups in terms of having problems accessing the product used in treatment ($p \geq 0.05$). Only four of the cases (5.6%) reported having difficulty accessing the product (Table 3).

More than half (54.9%) of the patients with congenital bleeding disorders expressed high levels of pandemic-related anxiety for themselves and their relatives. The rate of high anxiety was 43.9% in the group with COVID-19 and 70% in the group without COVID-19 (p=0.096, Table 4).

Of the hematology specialists included in the study, 77% (n=27) were pediatricians and eight 23% (n=8) were internal medicine specialists, all of whom were treating patients with congenital bleeding disorders. Among the physicians, most of whom (30/35; 86%) worked in a university hospital, 34% were women, 20% had less than 5 years of experience and 31% had more than 15 years of experience.

Eighty percent of the hematologists reported mild or moderate bleeding in their patients.

Of the physicians, 34.3% stated that they were highly concerned about the patients they followed during the pandemic. A significant relationship was found between the gender of the physicians and their level of concern in favor of the female gender (r_s=0.39 (39%); p=0.021) (Table 5). Physicians with more professional experience also had higher levels of anxiety about COVID-19 (Figure 1). No difference was found between pediatric and adult hematology specialists' levels of concern about the COVID-19 risk of the patients they followed during the pandemic (p=0.766>0.05; rs=-0.102).

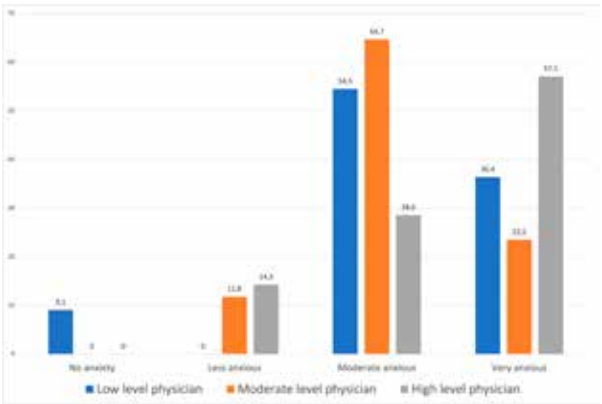

Figure 1: Physician's anxiety levels

DISCUSSION

The pandemic has led to psycho-social problems as well as medical problems with the suspicion that those with comorbidities in addition to signs of systemic disease

Table 3: Selected behaviors of cases with congenital bleeding disorders who are COVID-19 positive and negative.

	COVID-19 negative		COVID-19 positive		Difference Values (Positive-Negative)	
	n	%	n	%	n	%
Decreased frequency of infusions	8	26.7	11	26.8	3	- 0.2
Switch from prophylaxis regimen to infusion as bleeding occurs	12	40.0	11	26.8	1	+13.2
Postponement of scheduled surgeries	7	23.3	10	24.4	3	- 1.06
Forced switch due to product supply problems	1	3.3	3	7.3	3	- 3.98
Decreased communication due to the requirement to visit the hospital	13	43.3	15	36.6	2	+ 6.8
Obligation to learn how to use infusion at home	4	13.3	7	17.1	3	-3.7
TOTAL (CBD = 71)	30	100.0	41	100.0	11	

Table 4: Anxiety levels of cases with congenital bleeding disorders who are COVID-19 positive and negative

	Level of Anxiety				
	None	Low	Moderate	High	Total
COVID-19 negative	1 (3.3%)	3 (10.0%)	5 (16.7%)	21 (70.0%)	30 (100.0%)
COVID-19 positive	5 (12.2%)	3 (7.3%)	15 (36.6%)	18 (43.9%)	41 (100.0%)
Total	6 (8.5%)	6 (8.5%)	20 (28.2%)	39 (54.9%)	71 (100.0%)

*p= 0.096

Table 5: Anxiety levels of hematology specialists by gender

	Women		Men		Total	
	n	%	n	%	n	%
Low	0	0.0	4	16.7	4	11.4
Middle	5	45.5	14	58.3	19	54.3
High	6	54.5	6	25.0	12	34.3
TOTAL	11	100.0	24	100.0	35	100.0

related to the sars cov-2 virus were more affected (5). The suspicion of over-exposure in the elderly, as well as those with immunodeficiency, chemotherapy, or biological product users, was questionable in all those with CBDs, especially hemophiliacs (3,4).

Many scientific organizations such as the World Federation of Hemophilia (WFH) consider that patients with hemophilia are not at high risk for COVID-19 infection (7,8). However, there are also studies suggesting that patients with CBDs had a higher incidence of COVID-19 during this period (7). In addition, since most patients with CBDs show a general state of hypocoagulability, a study has also been published stating that this creates a protective effect against hypercoagulability in COVID-19 (9).

Based on the results of the questionnaire completed by 71 cases of CBD in our study, 26.8% of 41 patients who were COVID-19 positive or exposed during the pandemic, and 53.3% of 30 patients who were COVID-19 negative experienced various degrees of bleeding. The difference was statistically significant. During the pandemic, a greater increase in bleeding, a higher rate of switching to treatment due to bleeding, and a greater decrease in mobilization were observed in those who did not have COVID-19. In addition, pandemic-related concerns about themselves and their relatives were higher in this group, although not statistically significant.

The presence of chronic disease was a prominent source of concern during the pandemic. In patients with a life-long bleeding disorder, the sources of concern vary considerably. Failure to maintain the supply chains of the factor concentrates they use continuously, reduced donations of blood and plasma, reduced access to healthcare facilities and/or hemophilia treatment centers, postponement of elective surgeries they need, and the potential cessation of clinical trials in which they are involved are the main concerns (3-5,7,10-12).

Dorgalaleh et al. observed that in 25 COVID-19 patients with CBD, the main concern was the infection and death of their loved ones and the economic burden resulting from the infection of themselves or their relatives. During the pandemic, 6 patients had depression, and all but one of them missed replacement therapies. Of the four patients who received prophylaxis, only one received full treatment during the stay-at-home period, while the others discontinued prophylaxis. The authors stressed that COVID-19 infection had significant consequences on the lives of patients with CBD and caused some of them to engage in dangerous actions such as discontinuing treatment (12). In our study, 30% of our patients with COVID-19 and 37% of our patients without COVID-19 discontinued prophylaxis and switched to treatment when bleeding.

It was emphasized that the treatment, nutrition, and mental health of patients with hemophilia may be affected during the COVID-19 pandemic (1,7). The World Federation of Hemophilia (WFH) has published specific recommendations for these patients, however, it is known that interruption in the supply of replacement products due to problems in air transportation and other restrictions may be a problem for patients living in low- and middle-income countries where the rate of exposure to the virus is high and access to treatment is inadequate (1). In our study, only 8% of 71 patients with CBD reported difficulties in product procurement.

Apart from the logistical effects of the pandemic on patients' treatment, changes in patients' thoughts, behaviors, and emotions about their medical care cause them to worry and

have negative effects on their mental health (4,5).

In a systematic review of 16 quantitative studies conducted with 40,076 participants between 2019 and 2021 during the pandemic, high rates of anxiety, depression, and stress due to the pandemic were observed in adolescents with different backgrounds. It was also demonstrated that the frequency of alcohol and cannabis use by adolescents increased during the COVID-19 pandemic (13).

Moreover, it is known that insomnia has been quite common during the pandemic, and psychological reactions and poor sleep hygiene have also been reported in individuals without COVID-19 infection. It has been reported that prominent anxiety and depressive symptoms during the pandemic are associated with the fear of being infected in an environment with a rapidly increasing number of cases. In addition, economic stress, social distancing rules, and travel restrictions have also been found to be effective (14,15). In addition, suspected/confirmed cases, living in the most affected areas, and longer exposure to media during the day have been associated with a higher likelihood of anxiety and depression (15).

A review of 24 articles on the psychological impact of quarantine found that effective causes of stress included prolonged quarantine, fear of infection, frustration, boredom, inadequate supplies, inadequate information, financial losses, and stigmatization (16). In another study conducted in the USA to understand the psychological problems of the COVID-19 pandemic and its impact on the general fear associated with the virus, it was reported that the pandemic was associated with high levels of psychological stress and led to mental health disorders such as depression, anxiety and substance use (17). In this study, it was also found that age, male gender, and physical health were protective factors for stress (17). In our study, no statistically significant relationship was found between age and level of anxiety ($p>0.05$).

In the COVID-19 pandemic, healthcare workers mobilized all their resources to provide emergency and widespread healthcare services in an environment of general uncertainty. This situation has increased the concerns of healthcare professionals treating and caring for COVID-19 patients about mental health, psychological adjustment, and patient recovery. The factors affecting this situation are diverse. They include the number of individuals infected with the virus, lack of information about the course of the disease, deaths among health professionals, depletion of personal protective equipment, concerns about not being able to provide competent care when placed in a new area, lack of specific medications, increasing number of critically ill patients, lack of full-fledged care and treatment units, significant changes in social and family life, the feeling of inadequate support, concerns about their own health, fear of transmitting their infection to family members or others. There is also consensus that healthcare workers are at high risk of high levels of stress, anxiety, depression, burnout, addiction, and post-traumatic stress disorder, which may have long-term psychological effects (18).

In conclusion, our study shows that the COVID-19 pandemic has caused mental health problems not only among patients with chronic health problems but also among healthcare workers who are fighting the pandemic on the frontlines. Similar studies are important to show that health worker protection measures are also an important component of future health strategies. Therefore, we believe that it is necessary to develop strategies such as psychological support and training on crisis management for healthcare workers exposed to similar pandemic processes.

Ethics Committee Approval: This study was approved by Istanbul University Istanbul Faculty of Medicine Clinical Research Ethics Committee (18.02.2022-approval no: 750500)

Informed Consent: Written consent was obtained from the participants.

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Conflict of Interest: Authors declared no conflict of interest.

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RESEARCH ARTICLE
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Examining The Relationship Between Job Satisfaction and Compliance with Isolation Precautions in Nurses

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ABSTRACT

Objective: This study was conducted to examine whether there is a relationship between nurses' job satisfaction and their compliance with isolation measures.
Method: This was a descriptive study. The study was conducted on nurses working in a university hospital in Istanbul (N=878). The study was completed with a total of 659 nurses who volunteered to participate. The Nurse Information Form and the Minnesota Job Satisfaction Scale and Compliance with Isolation Precautions Scale were used in the study. In addition to descriptive statistical methods, Student's t Test, Mann Whitney U Test, Pearson correlation analysis and Spearman correlation analysis were used.
Results: In the study, nurses' mean Job Satisfaction was 3.16±0.71 and mean Compliance with Isolation Precautions was 4.16±0.55. It was determined that there was a statistically significant relationship between the Route of Infection sub-dimension of the Compliance with Isolation Precautions Scale and Intrinsic Satisfaction, Extrinsic Satisfaction, and Job Satisfaction ($p<0.01$).
Conclusion: In the study, it was found that nurses' job satisfaction was at a moderate level and their compliance with isolation precautions was at a high level; job satisfaction and compliance with isolation measures were related; factors such as educational status, working style, clinic, and department were effective on job satisfaction and compliance with isolation measures.

Keywords: Nursing, job satisfaction, compliance with isolation precautions

INTRODUCTION

Job satisfaction is defined as "the pleasure or positive emotional state towards the essence of the work (work structure, work environment, work conditions, etc.)" and "the general attitude of the employee towards his/her job" (1). Job satisfaction is the basis for individuals to be successful, happy, and productive. Job satisfaction can be affected by internal (individual characteristics) and external (environmental or organizational characteristics) factors (2). While the age, gender, education level, working time, and suitability or abilities of the individual doing the job constitute the internal factors affecting job satisfaction, the nature of the job, work environment, work conditions, wages received for the work done, and management style or organization of the job, etc., constitute the external factors (3). Job satisfaction is a very important issue for nurses because it affects the quality of care. As nurses' job satisfaction increases, their compliance with the structure of their work, organizational and institutional commitment, and productivity levels may also increase (4).

While nosocomial infection is defined as derived from the words disease, treatment, and hospital, it has recently been defined as healthcare-associated infections (HAIs) (5). Healthcare workers' compliance with isolation measures is very important to prevent HAIs. Isolation precautions refer to measures taken to reduce the risk of transmission of pathogens and to reduce the risk of direct contact with secretions and body fluids of patients with infectious diseases or contact with contaminated objects (6). The Centers for Disease Control (CDC) reported that the rate of HAI decreased by 30% when isolation measures were followed (7). Nurses, one of the health care professionals who have the most contact with patients, play a major role in preventing HAI (8). In another study in which professional and

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institutional factors were determined in nurses' compliance with isolation measures, it was found that nurses' compliance with isolation measures was at a moderate level (9).

In the national and international literature, there are some studies investigating the levels of job satisfaction (1, 4, 10-12) and compliance with isolation measures (13-15) in nurses. There are no studies on the relationship between nurses' job satisfaction and their compliance with isolation precautions. This study was conducted to examine whether there is a relationship between nurses' job satisfaction and their compliance with isolation precautions.

MATERIAL AND METHOD

Population and Sample of the Study

The research is a descriptive study. It was conducted on nurses working in a university hospital in Istanbul (N=878). To participate in the study, it was necessary to have been working for at least 1 year. Since all of the nurses had been working in the hospital for at least 1 year, it was sufficient for them to volunteer to participate in the study. A total of 659 nurses volunteered to participate in the study and were working in the hospital during the period when the research data were collected, without any sampling calculation in the study. In the study, 75% of the population was reached. The study was conducted between February and April 2018.

Data Collection Tools

The "Nurse Information Form," "Minnesota Job Satisfaction Scale," and "Scale of Compliance with Isolation Precautions" were used to collect the data of the study.

Nurse Information Form: Socio-demographic characteristics were included.

Minnesota Job Satisfaction Scale: This scale was developed in 1967 by Weiss et al. (16). It was adapted into Turkish by Baycan (17) in 1985. The internal consistency coefficient for the original scale was 0.83, and in the Turkish adaptation it was found to be 0.90. In this study, this value was 0.88 (17). The scale consists of two sub-dimensions: Internal Satisfaction and External Satisfaction. The scale is a 5-point Likert-type scale. There are 20 items in total. Scores between 20 and 100 can be obtained from the scale (13).

Compliance with Isolation Precautions Scale (CIPS): This scale was developed by Tayran and Ulupınar (18). It consists of 18 items and is a 5-point Likert-type scale. The scale has four sub-dimensions: Route of Infection (RI), Practitioner-Patient Safety (PPS), Environmental Safety (ES), and Hand-Hygiene/Glove Use (HGU). The internal consistency coefficient for the original scale was 0.85 (18). In this study, this value was 0.88. Scores between 18 and 90 are obtained from the scale. The higher the score, the higher the compliance with isolation precautions (18).

Data analysis

The NCSS (Number Cruncher Statistical System) 2007 (Kaysville, Utah, USA) program was used for statistical analyses. In addition to descriptive statistical methods, Student's t test and Mann Whitney U test were used for two group comparisons. A one-way ANOVA test, Bonferroni test, Games-Howell test, Kruskal Wallis test, and Mann Whitney U test with Bonferroni correction were used for comparisons of three or more groups. Pearson correlation analysis and Spearman correlation analysis were used to evaluate the relationships between variables. Significance was evaluated at $p<0.05$.

Ethical Dimension of the Research

The Declaration of Helsinki was adhered to in the study. Before the study, nurses were informed about the purpose of the study and data protection. The questionnaire form was given to the nurses who voluntarily agreed to participate. Informed consent was obtained from them.Written ethics committee permission was obtained from the local ethics committee of the institution where the study was conducted (Date of approval: 29.12.2017-1549).

RESULTS

The mean age of the nurses was 36.2±9.2 years. The majority were female (91.8%) and married (60.8%), and had a bachelor's degree (69%). In addition, the majority of the nurses worked in the ward (445%), in shifts (55.5%), as nurses (90.3%), and in surgical clinics (52.5%).

For nurses, the mean score of Intrinsic Satisfaction was 3.34±0.71, the mean score of Extrinsic Satisfaction was 2.99±0.77, and the mean score of total Job Satisfaction Scale was 3.16±0.71. The mean value of the RI is 4.21±0.63, the mean value of PPS is 4.16±0.59, the mean value of ES is 4.06±0.70, the mean value of HGU is 4.10±0.71, and the mean value of the total CIPS is 4.16±0.55.

The relationships between the scores of the nurses on the Job Satisfaction Scale and the CIPS are shown in detail in Table 1. When the relationships between the age distribution of the nurses and the sub-dimension and total scores of the Job

Table 1: Evaluation of the relationship between Job Satisfaction Scale and Compliance with Isolation scores

Compliance with Isolation Scale	Intrinsic Satisfaction Score		Extrinsic Satisfaction Score		Job Satisfaction Total Score	
	r	*p*	r	*p*	r	*p*
Transmission Route Score	0.168	**0.001****	0.105	**0.007****	0.139	**0.001****
Employee and Patient Safety Score	0.137	**0.001****	0.043	*0.273*	0.089	**0.022***
Environmental Control Score	0.231	**0.001****	0.163	**0.001****	0.201	**0.001****
Hygiene and Glove Use Score	0.022	0.569	-0.032	0.413	-0.007	0.851
Total Isolation Score	0.094	**0.016***	0.016	0.690	0.054	0.168

[b]r=Spearman's Correlation Coefficient, *p<0.05, **p<0.01

Table 2: Evaluation of the relationship between age distribution and sub-dimension and total scores of the Job Satisfaction Scale and Compliance with Isolation Scale

	Age	
	r	p
Job Satisfaction Scale		
Intrinsic Satisfaction Score	0.255	[a]**0.001****
Extrinsic Satisfaction Score	0.249	[a]**0.001****
Job Satisfaction Total Score	0.264	[a]**0.001****
Compliance with Isolation Scale		
Transmission Route Score	0.062	[b]0.111
Employee and Patient Safety Score	0.009	[b]0.825
Environmental Control Score	0.110	[b]**0.005****
Hygiene and Glove Use Score	0.005	[b]0.907
Total Isolation Score	0.023	[b]0.556

*[a]r=Pearson Correlation Coefficient, [b]r=Spearman's Correlation Coefficient, **p<0.01*

Satisfaction Scale and the CIPS were examined, a statistically significant positive relationship was found between the ages of the nurses and "Internal Satisfaction." It was found that as the age of the nurses increased, their external job satisfaction levels and total job satisfaction levels increased. There was no statistically significant relationship between the ages of the nurses and the sub-dimension scores of the Compliance with Isolation Precautions Scale, which include "Route of Infection," "Practitioner-Patient Safety," and "Hand-Hygiene/Glove Use." A weak positive correlation was found to be statistically significant between the age of the nurses and their scores in the "Environmental Safety " sub-dimension of the CIPS (Table 2).

The comparison of Job Satisfaction and CIPS of nurses according to gender, marital status, and educational status is analyzed in detail in Table 3. Table 4 shows the comparison of Job Satisfaction and CIPS of the nurses according to the clinic, working style, task, and the department in which they work.

When the relationships between nurses' years of service in the profession and in the institution and the sub-dimension and total scores of the Job Satisfaction Scale and the Scale of Compliance with Isolation Precautions were examined, a statistically significant positive relationship was found between nurses' years of service in the profession and the "Internal Satisfaction" sub-dimension scores of the Job Satisfaction Scale (r=0.251; p=0.001; p<0.01). A positive correlation was found between the working years of the nurses and the "External Satisfaction" sub-dimension scores of the Job Satisfaction Scale. There was no statistically significant correlation between the working years of the nurses and the total scale scores from the sub-dimensions of "RI," "PPS," "Hand-Hygiene/Glove Use," and Compliance with Isolation Precautions. A weak positive correlation was found to be statistically significant between the working hours of the nurses and the "ES" sub-dimension scores of the CIPS (Table 5).

DISCUSSION

In a study conducted to examine the relationship between nurses' job satisfaction and compliance with isolation measures, it was found that their job satisfaction was at a moderate level and their CIPS was at a high level. In another study by Korkmaz Aslan and Ünal Aslan, in which they examined "the presence of nomophobia in nurses and its effect on job satisfaction," it was found that, contrary to our study, nurses' general satisfaction and intrinsic satisfaction were slightly high and their extrinsic satisfaction was low (4). In another study investigating the compliance with isolation measures of nurses working in a public hospital, it was concluded that the compliance of nurses with isolation precautions was quite high (15). The good compliance of the nurses in our study with isolation precautions is similar to other similar studies in the literature (7, 9, 13, 15, 19, 20).

In the study, as the Intrinsic Satisfaction of the nurses increased, the mean scores of the RI, PPS, ES sub-dimension, and total scores of compliance with isolation precautions increased. As the Extrinsic Satisfaction of the nurses increased, the mean scores of the RI and ES sub-dimensions of compliance with isolation precautions increased. In another study examining the relationship between isolation compliance and glove use attitudes of intensive care nurses and job satisfaction, it was determined that there was a significant, positive, and moderate relationship between job satisfaction and sub-scores of intensive care nurses and isolation compliance (13). Job satisfaction is defined as the totality of positive feelings that an individual shows towards his/her job. If a person has high job satisfaction, it means that he/she likes his/her job and has positive values towards it. All dimensions of the job are effective in creating job satisfaction for the individual. It is noted that individuals who are satisfied with their jobs love their jobs more and respect their jobs more (3). Satisfaction of nurses with their jobs is very important in increasing the quality of care. Therefore, practices to increase compliance with isolation precautions in infection control should be implemented. In this way, the desired level of care results can be achieved in patients.

In the study, it was found that the levels of intrinsic satisfaction, extrinsic satisfaction and compliance with Environmental Safety increased as the age of the nurses increased. Contrary to our study, there are other studies in the literature reporting that there is no relationship between sociodemographic characteristics of nurses and job satisfaction (10, 21). On the other hand, it has been reported that age is among the individual factors affecting job satisfaction. It is emphasized that institutions prioritize the age factor in recruitment of personnel (3). According to Özpehlivan; In one study, it was found that older employees obtained more satisfaction from their jobs than younger employees. Researchers explained this situation in three ways. First, when people get older, their feelings of satisfaction, which decrease with the disappointments they experience at work, are balanced by the increase in satisfaction they experience in other parts of their lives (3). Secondly, it

Table 3: Evaluation of sub-dimension and total scores of Job Satisfaction Scale and Adaptation to Isolation Scale according to gender, marital status, and educational status

		Gender		*p*	Marital Status		*p*	Education Status				*p*
		Female (n=605)	Male (n=54)		Married (n=401)	Single (n=258)		High school (n=22)	Associate (n=78)	Bachelor (n=455)	Postgraduate (n=104)	
Job Satisfaction Scale												
Intrinsic Satisfaction Score	*Min-Max (Median)*	1-5 (3.42)	1-5 (3.33)	[c]0.722	1-5 (3.5)	1-5 (3.25)	[c]**0.001****	2.08-4.17 (3.67)	2.5-5 (3.58)	1-5 (3.33)	1.27-5 (3.33)	[e]**0.014***
	Mean±SD	3.34±0.7	3.3±0.77		3.42±0.65	3,21±0.78		3.46±0.58	3.53±0.54	3.31±0.73	3.3±0.74	
Extrinsic Satisfaction Score	*Min-Max (Median)*	1-5 (3)	1-5 (2.88)	[c]0.711	1-5 (3.13)	1-5 (2.88)	[c]**0.001****	2.25-4.13 (3.13)	1.75-4.88 (3.13)	1-5 (3)	1-5 (3.13)	[e]**0.013***
	Mean ±SD	2.98±0.76	3,02±0,85		3.07±0.72	2.86±0.83		3.16±0.48	3.18±0.62	2.94±0.8	3.03±0.77	
Job Satisfaction Total Score	*Min-Max (Median)*	1-5 (3.22)	1-5 (3.11)	[c]0.981	1-5 (3.33)	1-5 (3.01)	[c]**0.001****	2.23-4.02 (3.47)	2.13-4.94 (3.38)	1-5 (3.15)	1.21-5 (3.24)	[e]**0.011***
	Mean ±SD	3.16±0.7	3.16±0.79		3.24±0.65	3.04±0.77		3.31±0.5	3.35±0.55	3.12±0.73	3.17±0.72	
Compliance with Isolation Scale												
Transmission Route Score	*Min-Max (Median)*	1-5 (4)	1.75-5 (4)	[d]0.120	1.2-5 (4)	1-5 (4)	[d]0.415	3-5 (4)	1.2-5 (4)	1-5 (4)	2.2-5 (4)	[f]0.543
	Mean ±SD	4.22±0.61	4,04±0,79		4.24±0.57	4.16±0.71		4.21±0.59	4.16±0.7	4.2±0.63	4.31±0.56	
Employee and Patient Safety Score	*Min-Max (Median)*	2,33-5 (4,33)	2,83-5 (4)	[d]0.001**	2.33-5 (4.33)	2.67-5 (4.33)	[d]0.760	3-4.83 (4.25)	2.83-5 (4.17)	2.33-5 (4.17)	2.67-5 (4.33)	[f]**0.012***
	Mean ±SD	4.19±0.57	3,83±0,71		4.18±0.55	4.13±0.65		4.20±0.56	4.10±0.57	4.14±0.60	4.32±0.56	
Environmental Control Score	*Min-Max (Median)*	1-5.25 (4)	2-5 (4)	[d]0.118	1.5-5 (4)	1-5.25 (4)	[d]0.775	3-5 (4)	1.25-5 (4)	1-5 (4)	2.5-5.25 (4)	[f]0.556
	Mean ±SD	4.08±0.69	3.9±0.74		4.09±0.62	4.02±0.8		4.14±0.55	4.01±0.78	4.05±0.71	4.17±0.63	
Hygiene and Glove Use Score	*Min-Max (Median)*	1-5 (4)	1-5 (4)	[d]0.002**	1-5 (4)	2-5 (4)	[d]0.960	3-5 (4.17)	1-5 (4)	1-5 (4)	2-5 (4.33)	[f]**0.025***
	Mean ±SD	4.13±0.69	3.79±0.83		4.11±0.69	4.10±0.73		4.20±0.70	4.03±0.74	4.07±0.71	4.27±0.68	
Total Isolation Score	*Min-Max (Median)*	2.11-5 (4.18)	2.56-5 (3.91)	[d]0.001**	2.34-5 (4.17)	2.11-5 (4.17)	[d]0.658	3-4.88 (4.23)	2.34-5 (4.06)	2.11-5 (4.16)	2.84-5 (4.33)	[f]**0.034***
	Mean ±SD	4.18±0.54	3.89±0.63		4.18±0.51	4.13±0.61		4.20±0.55	4.10±0.57	4.14±0.55	4.30±0.51	

[c]Student-t Test, [d]Mann Whitney U Test, [e]Oneway Anova, [f]Kruskal Wallis Test, *p<0.05, **p<0.01, **p<0.01

Table 4. Evaluation of sub-dimension and total scores of the Job Satisfaction Scale and Compliance with Isolation Scale according to the clinic, working style, task, and department

		Clinics							Work shift			Duty			Department		
		Intensive Care (n=125)	Ward (n=293)	Emergency (n=51)	Operating Room (n=73)	Outpatient Clinic (n=48)	Day Unit (n=69)	*p*	day shift (n=293)	day-night shift (n=366)	*p*	Manager Nurse (n=64)	Nurse (n=595)	*p*	Surgery (n=346)	Internal Medicine (n=313)	*p*
Job Satisfaction Scale																	
Intrinsic Satisfaction Score	*Min-Max (Median)*	1-5 (3.17)	1-5 (3.42)	1-4.83 (3.18)	1-5 (3.25)	2.33-5 (3.78)	1.42-4.83 (3.67)	[e]**0.001****	1-5 (3.67)	1-5 (3.25)	[c]**0.001****	1-4.5 (3.67)	1-5 (3.42)	[c]**0.054**	1-5 (3.25)	1-5 (3.58)	[c]**0.001****
	Mean±SD	3.2±0.79	3.35±0.68	3.13±0.68	3.26±0.72	3.68±0.66	3.55±0.61		3.54±0.62	3.18±0.74		3.5±0.65	3.32±0.71		3.25±0.73	3.43±0.67	
Extrinsic Satisfaction Score	*Min-Max (Median)*	1-5 (2.88)	1-5 (3.13)	1-5 (2.71)	1-4.88 (3)	1,75-5 (3,31)	1-4.38 (3.38)	[e]**0.001****	1-5 (3.25)	1-5 (2.88)	[c]**0,001****	1-4.25 (3.25)	1-5 (3)	[c]**0.010***	1-5 (3)	1-5 (3.13)	[c]**0.032***
	Mean±SD	2.82±0.82	3.01±0.73	2.72±0.77	2.91±0.8	3,36±0,74	3.22±0.67		3.22±0.67	2.8±0.79		3.19±0.64	2.96±0.78		2.93±0.79	3.05±0.74	
Job Satisfaction Total Score	*Min-Max (Median)*	1-5 (3.02)	1-5 (3.25)	1-4.92 (2.92)	1-4,94 (3,08)	2.13-5 (3.56)	1.21-4.6 (3.43)	[e]**0.001****	1-5 (3.44)	1-5 (3)	[c]**0.001****	1-4.25 (3.49)	1-5 (3.17)	[c]**0.028***	1-4.96 (3.08)	1-5 (3.38)	[c]**0.005****
	Mean±SD	3.01±0.77	3.18±0.67	2.92±0.69	3.08±0.72	3.52±0.67	3.38±0.61		3.38±0.61	2.99±0.73		3.35±0.62	3.14±0.71		3.09±0.73	3.24±0.67	
Compliance with Isolation Measures Scale																	
Transmission Route Score	*Min-Max (Median)*	2-5 (4)	1-5 (4)	1.75-5 (4)	2-5 (4)	3.25-5 (4.1)	3-5 (4)	[f]**0.009****	1.2-5 (4)	1-5 (4)	[d]0.530	1-5 (4)	1.2-5 (4)	[d]0.901	1-5 (4)	1.2-5 (4.2)	[d]**0.036***
	Mean±SD	4.24±0.6	4.24±0.66	3.92±0.65	4.14±0.66	4.28±0.48	4.25±0.53		4.24±0.59	4.18±0.66		4.18±0.72	4.21±0.62		4.17±0.62	4.25±0.64	
Employee and Patient Safety Score	*Min-Max (Median)*	2.67-5 (4.33)	2.33-5 (4.33)	3-5 (4)	2.83-5 (4.17)	3-5 (4.17)	3-5 (4,33)	[f]**0.044***	2.33-5 (4.17)	2.67-5 (4.33)	[d]0.780	3-5 (4.33)	2.33-5 (4.17)	[d]0.096	2.67-5 (4.17)	2.33-5 (4.33)	[d]0.454
	Mean±SD	4.13±0.59	4.22±0.60	4.03±0.55	4.07±0.56	4.13±0.61	4.21±0.60		4.19±0.56	4.15±0.62		4.28±0.55	4.15±0.60		4.15±0.59	4.18±0.59	
Environmental Control Score	*Min-Max (Median)*	1-5 (4)	1-5 (4)	2-5 (4)	1.5-5.25 (4)	2.5-5 (4)	2.5-5 (4)	[f]0.126	1.5-5.25 (4)	1-5 (4)	[d]**0.018***	1-5 (4.25)	1-5.25 (4)	[d]0.070	1-5.25 (4)	1.25-5 (4)	[d]0.203
	Mean±SD	4.04±0.73	4.08±0.7	3.87±0.63	3.98±0.81	4.2±0.58	4.17±0.61		4.14±0.64	4.00±0.74		4.16±0.79	4.05±0.69		4.03±0.72	4.11±0.67	
Hygiene and Glove Use Score	*Min-Max (Median)*	2-5 (4.,33)	1-5 (4)	2.33-5 (4)	2-5 (4.33)	1-5 (4)	2,33-5 (4)	[f]0.139	1-5 (4)	1-5 (4)	[d]0.685	2.33-5 (4.17)	1-5 (4)	[d]0.417	1-5 (4)	1-5 (4)	[d]0.940
	Mean±SD	4.22±0.67	4.10±0.73	3.96±0.67	4.12±0.68	3.98±0.80	4,09±0,67		4.10±0.69	4.11±0.73		4.18±0.62	4.10±0.72		4.10±0.71	4.11±0.71	
Total Isolation Score	*Min-Max (Median)*	2.42-5 (4.28)	2.11-5 (4.22)	2.58-5 (4)	2.56-4.94 (4.17)	3.19-5 (4,01)	3-5 (4.18)	[f]**0.052**	2.34-5 (4.13)	2.11-5 (4.18)	[d]0.959	2.11-5 (4.17)	2.34-5 (4.17)	[d]0.378	2.11-5 (4.17)	2.34-5 (4.16)	[d]0.655
	Mean±SD	4.20±0.55	4.19±0.56	3.97±0.55	4.11±0.56	4.13±0.52	4.18±0.52		4.18±0.52	4.14±0.58		4.21±0.55	4.15±0.55		4.14±0.56	4.18±0.54	

[e]Oneway Anova, [c]Student-t Test, [d]Mann Whitney U Test, [f]Kruskal Wallis Test, *p<0.05, **p<0.01

Table 5: Evaluation of the relationships between the duration of working in the profession and in the institution and the sub-dimension and total scores of the Job Satisfaction Scale and Compliance with Isolation Scale

		Meslekteki Çalışma Süresi		Duration of Work in the Institution	
		r^b	*p*	r^b	*p*
Job Satisfaction Scale	**Intrinsic Satisfaction Score**	0.251	**0.001****	0.235	**0.001****
	Extrinsic Satisfaction Score	0.241	**0.001****	0.23	**0.001****
	Job Satisfaction Total Score	0.258	**0.001****	0.241	**0.001****
Compliance with Isolation Scale	**Transmission Route Score**	0.074	0.058	0.072	**0.065**
	Employee and Patient Safety Score	0.043	0.271	0.022	0.569
	Environmental Control Score	0.115	**0.003****	0.107	**0.006****
	Hygiene and Glove Use Score	0.002	0.958	0.014	0.712
	Total Isolation Score	0.041	0.291	0.038	0.327

[b]r=Spearman's Correlation Coefficient, **p<0.01

is thought that older individuals prioritize themselves in job selection and choose the job they like (3). Finally, as people get older, they withdraw from jobs where they cannot achieve satisfaction (3). In addition, in another study, contrary to our study, it was found that there was no relationship between nurses' age and their compliance with isolation precautions (7).

It was determined that female nurses' compliance with PPS and HGU and their compliance with isolation measures in general were higher than that of male nurses. There are some studies in the literature that are not similar to this result (7). It is thought that the levels of compliance with isolation may be different according to gender because of the majority of female nurses in our study. In our study, intrinsic and extrinsic job satisfaction and general job satisfaction of married nurses were found to be higher than single nurses. Compliance with isolation precautions did not differ according to marital status. On the other hand, marital status is considered to be one of the factors thought to affect job satisfaction (3).

In the study, it was found that there were differences in job satisfaction levels according to educational status. Education level is an important factor in terms of forming the expectations of the individual in working life (3). However, contrary to our results, a systematic review of intensive care nurses found no relationship between socio-demographic characteristics of nurses and job satisfaction (10). In our study, it was found that nurses with postgraduate education adapted to isolation more than others in the sub-dimensions of "PPS" and "HGU" and in general. In another study conducted by Doğu and Tiryaki with intensive care nurses, it was determined that the level of education did not affect compliance with isolation precautions (13). There are some studies in the literature similar to our study result (9). In the study, it was found that there were differences in job satisfaction levels and compliance with isolation precautions in the sub-dimensions of RI and PPS. In addition, it was determined that intensive care nurses were more compliant with isolation measures. Similar to the results of this study, it has been reported in the literature that nurses in intensive care comply with isolation precautions more (9).

In this study, it was found that nurses working continuous day shifts had higher levels of job satisfaction and compliance with ES than nurses working in shifts. In the study, it was found that as the professional and institutional working years of the nurses increased, their levels of job satisfaction and compliance with environmental safety increased. In the study, the extrinsic satisfaction sub-dimension and general job satisfaction level of executive nurses were higher. In addition, nurses working in internal units had higher levels of job satisfaction and the RI sub-dimension of CIPS than nurses working in surgical units. It is an expected result that the levels of job satisfaction and CIPS of nurses working in continuous day shifts and with increased professional and working time are higher. However, the reasons for these results can be discussed with the results of a qualitative study. In this sense, the fact that the data in our study were obtained only by the quantitative method shows the limitation of our study.

CONCLUSION

As a result of the study, it was found that nurses had moderate job satisfaction and a high level of compliance with isolation precautions. In addition, some sociodemographic and occupational characteristics were found to affect job satisfaction and compliance with isolation, and job satisfaction and compliance with isolation were related. Therefore, it may be recommended to develop some strategies to increase nurses' job satisfaction.

Ethics Committee Approval: This study was approved by the local ethics committee of the institution where the study was conducted (Date of approval: 29.12.2017-1549).

Informed Consent: Written consent was obtained from the participants.

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Determination of Alexithymia and Communication Skills Levels of Nursing Students After Restrictions in the Covid-19 Pandemic

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ABSTRACT

Objective: This descriptive cross-sectional study was carried out to determine nursing students' alexithymia and communication skills levels and affecting factors, and to investigate the relationship between alexithymia level and communication skills after the restrictions of the Covid-19 pandemic.
Materials and Methods: The sample consisted of nursing students (N=140) from a private university in Istanbul, Turkey. Data were collected using a Personal Information Form, Toronto Alexithymia Scale (TAS-20) and Communication Skills Scale (CSS).
Results: It was determined that 90.7% (n=127) of the participants were female, the mean age was 20.63±1.53 and 30.7% (n=43) were senior nursing. 55.0% (n=77) of the participants stated that their interpersonal relations were good after the restrictions. Participants had a mean TAS-20 score of 55.15±9.12 and a CSS score of 102.25±11.29. It was determined that TAS-20 and CSS total and sub-dimension mean scores differed according to sociodemographic characteristics. The results showed that there was a significant relationship between the sub-dimension mean scores of both scales and the level of interpersonal relationships stated by the participants after the restrictions ($p<0.05$).
Conclusion: It was stated that nursing students had moderate alexithymia and good communication skills. Participants who evaluated their interpersonal communication as bad after the restrictions had more difficulty in recognizing, expressing and communicating their emotions. It is recommended that innovative practices on emotion awareness and communication be integrated into the nursing curriculum, and that evidence-based research be conducted on the subject.

Keywords: Alexithymia, communication skills, nursing student, pandemic

INTRODUCTION

Being aware of our own and other individuals' emotions is an important component of human relationships for our psychosocial and physical well-being. However, for various reasons, many people may have difficulty recognizing and expressing their emotions (1). Alexithymia, which was introduced to the literature by Nemiah and Sifneos in the early 1970s, is also called emotional deafness (2,3). Alexithymia is defined as (1) difficulty in defining emotions, (2) difficulty in distinguishing between emotions and bodily sensations, (3) limited imagination due to emotional deprivation, and (4) avoidance of emotional thoughts. It has been seen that alexithymia has been associated with psychosomatic problems and emotion regulation disorders since the 1970s. (2,4,5). When the article by Bagby et al., who developed the scale, is examined; it is seen that there is a statistically significant relationship between all sub-dimensions of the scale they developed to determine the level of alexithymia and decreased ability to experience openness to experience and pleasurable emotions (such as joy, happiness, and love) (5).

The individual cannot make sense of and express his own feelings, and may remain blind to the feelings of others (6).

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In this context, while alexithymia causes problems in the definition of emotional state, it also affects interpersonal communication. On the other hand, our communication skills also affect our emotions (7). Effective communication skill in the nursing profession is accepted as both a personal skill and a technique learned and gained in the teaching process (8). Effective communication between the nurse and the patient, their relatives, and other health professionals improves both the quality of patient care and patient satisfaction by assisting the patient in coping with stress, finding solutions to problems, and healing. These results directly support the increase in professional satisfaction (9). As the development of nursing students' communication skills is related to innovative learning strategies, interactive learning strategies can be developed by evaluating students' communication skill levels (10). Many difficulties were encountered during the pandemic period in nursing education, which was traditionally conducted in a face-to-face learning environment (11). As a matter of fact, there are studies on the use of different strategies for communication skills in nursing education during the pandemic period (12-15). With the removal of the restrictions after the pandemic period, the face-to-face education order was returned (11).

In the nurse-patient relationship, both emotional awareness and communication skills constitute the basic aspects of care in order to recognize the needs of the patient and establish a therapeutic relationship (8). As a result, it is stated that nursing students should focus on managing their emotional competencies in relation to the patient and evaluating their communication skills, rather than memorizing concepts that are useful for passing exams or gaining practical skills (16,17). Nurses that are emotionally aware communicate more effectively with patients, which improves patient care outcomes (6).

During the Covid-19 epidemic, university students maintained their studies through a variety of online platforms. Restrictions, social distancing, and the adoption of home quarantine have led to increased usage of social media and the internet for a variety of purposes (3,18,19). Some studies have found that constraints during the pandemic promote alexithymia in university students and significantly impact their communication abilities. There are numerous studies in the literature that assessed nursing students' alexithymia and communication abilities before and during the pandemic (1,3,8,16,18). However, there has not been research on the evaluation of alexithymia and communication skills after the pandemic and restrictions. It is thought that this study will fill this gap in the literature. Research findings are important in order to see the general process before, during, and after the pandemic.

METHODS

Design

This descriptive cross-sectional study had three objectives: (1) determining the levels of alexithymia and communication skills of nursing students after the restrictions in the Covid-19 pandemic, (2) investigating the relationship between students' alexithymia and communication skills and their sociodemographic characteristics, and (3) examining after the restrictions in the Covid-19 pandemic.

Sample

The study population consisted of a total of 300 nursing students from the nursing department of a private university in Istanbul, Turkey, in the 2021-2022 academic year. Participants were recruited using simple random sampling. The inclusion criteria were (1) being 18 years of age or older, and (2) being an active student during data collection. The exclusion criteria were (1) not having filled out the data collection forms and (2) receiving or having received treatment for a mental disorder. Power analysis was performed using the G Power 3.1 program, the power of the study was found to be 90% with the effect size (d=0.15) and 5% margin of error for a sample size of 143. One hundred and fifty students filled out the data collection forms. Ten students were excluded from the analysis because they received or had been receiving treatment for mental disorders or not having filled out the data collection forms. Therefore, the sample consisted of 140 students.

Measures

All participants were informed about the research purpose and procedure. The data were collected using a Personal Information Form, Toronto Alexithymia Scale (TAS-20), and Communication Skills Scale. The data were collected online (Google Forms) between March and June 2021. All participants were emailed the questionnaire.

The personal information form was based on a literature review conducted by the researchers (1,3,8,16,18). The form consisted of four items (age, gender, grade etc.). At the end of the form, the participants were asked a question of self-evaluation, "When you think about your social relationships after the restrictions in the Covid-19 pandemic, how would you describe your interpersonal relations?".

Toronto Alexithymia Scale (TAS-20) was developed by Bagby, Parker & Taylor (1994) and adapted to Turkish by Güleç et al. (2009) (4,20). The scale is the first measurement tool used to measure alexithymia. The scale consists of 20 items and three subscales: difficulty identifying feelings, difficulty describing feelings, and externally-oriented thinking. The items are rated on a five-point Likert-type scale ("1=strongly disagree" to "5=strongly agree"). Higher scores indicate that individuals talk less (or not at all) about their own emotions or cannot distinguish their emotions while doing this. The scale has a Cronbach's alpha of 0.78, and the subscales were between 0.57-0.80 (20), which was 0.724 in the present study.

The Communication Skills Scale was developed by Owen and Bugay (21) to evaluate the communication skills of university students. The scale consists of 25 items and a four-factor structure: communication principles and basic skills, self-expression, active listening and non-verbal communication, and willingness to communicate. Higher scores indicate that the level of communication skills is high. The scale has a Cronbach's alpha of 0.88 (21), which was 0.884 in the present study.

Data analysis

The data were analyzed using the Statistical Package for Social Sciences (SPSS, v.24 NY, New York) at a significance level of p<0.05. Frequency (n), percentage (%), and minimum and maximum values were used for descriptive statistics. Independent samples t-test, which is one of the parametric tests, was used in the comparison of the quantitative data in pairs, the One-Way ANOVA test was used in the comparisons of more than two groups, and the Tukey test was used for post hoc analyses. Pearson correlation analysis was used to determine the relationship between scale scores.

Ethical Considerations

Institutional permissions and ethics committee approval was obtained (Date: 03.12.2021 & No: 2021/23). Permission was obtained from the university. All nursing students were briefed about the research purpose, procedure, and confidentiality. Informed consent was obtained from those who agreed to participate in the study. The study was conducted in line with the Declaration of Helsinki. The manuscript was prepared in accordance with STROBE guidelines for cross-sectional studies (22).

Limitations

The findings of this study should be interpreted within the scope of several limitations. First of all, the results are sample-specific and not generalizable to the whole population. Second, the research findings are based on students' self-report. Third, the findings of the study should be interpreted within the context of the cross-sectional nature of the study.

RESULTS

Sociodemographic characteristics and scales' results

It was determined that the mean age of the participants was 20.63±1.53 years, 90.7% were female and 30.7% were senior students. More than half of the participants stated that their interpersonal communication was good after the restrictions during the Covid-19 pandemic (Table 1).

Participants had a mean TAS-20 score of 55.15±9.12, with the breakdown of scores as follows: "difficulty identifying feelings", "difficulty describing feelings" and "externally-oriented thinking" scores of 16.41±5.66, 13.87±3.09 and 24.87±3, respectively. Participants had a mean CSS score of 102.25±11.29, with the breakdown of scores as follows: "communication principles and basic skills", "self – expression", "active listening and non-verbal communication" and "willingness to communicate" scores of 41.52±4.85, 15.82±2.89, 25.31±3.24 and 19.57±3.30, respectively (Table 2).

Toronto alexithymia scale results

Male participants had a significantly higher mean TAS-20, difficulty describing feelings, and externally-oriented thinking scores than their female counterparts (p<0.05). Participants who stated that their interpersonal communication was bad after the restrictions in the Covid-19 pandemic had significantly higher mean TAS-20 and all sub-dimensions scores than those whose communication was good (p<0.05) (Table 3).

Communication skills scale results

Female participants had a significantly higher mean CSS "communication principles and basic skills" subscale score than their male counterparts (p<0.05). Participants who stated that their interpersonal communication was good after the restrictions in the Covid-19 pandemic had significantly higher mean CSS, self-expression, active listening and non-verbal communication, and willingness to communicate scores than those whose communication was bad (p<0.05) (Table 4).

Table 1: Participants' Sociodemographic Characteristics (N=140)

Sociodemographic Characteristics	Mean ± SD	
Age	20.63±1.53	
	n	**%**
Gender		
Women	127	90.7
Men	13	9.3
Grade		
1st	38	27.1
2nd	28	20.0
3rd	31	22.1
4th	43	30.7
When you think about your social relationships after the restrictions in the Covid-19 pandemic, how would you describe your interpersonal relations?		
I think my interpersonal relations were good.	77	55.0
I think my interpersonal relations were bad.	23	16.4
Neutral	40	28.6

Table 2: Descriptive statistics – scales' scores (N=140)

Scales	Mean ± SD	Minimum	Maximum	Number of Items
Difficulty Identifying Feelings	16.41±5.66	7.00	35.00	7
Difficulty Describing Feelings	13.87±3.09	5.00	21.00	5
Externally-Oriented Thinking	24.87±3.80	13.00	34.00	8
Toronto Alexithymia Scale (TAS-20)	**55.15±9.12**	31.00	87.00	20
Communication principles and basic skills	41.52±4.85	26.00	50.00	10
Self-expression	15.82±2.89	8.00	26.00	4
Active listening and non-verbal communication	25.31±3.24	16.00	30.00	6
Willingness to communicate	19.57±3.30	11.00	25.00	5
Communication Skills Scale (CSS)	**102.25±11.29**	71.00	124.00	25

It was found that there was a low level and statistically significant correlation was found between the mean of TAS-20 and its sub-dimensions scores and CSS "self-expression" sub-dimension mean score. However, it was determined that there was a low nonlinear and statistically significant relationship between the total score of the CSS and all the sub-dimensions of TAS-20. There was no statistically significant correlation found between the total scores of both scales (p>0.05) (Table 5).

DISCUSSION

While the primary goal of this study was to determine nursing students' levels of alexithymia and communication skills following the restrictions in the Covid-19 pandemic process, the secondary goal was to determine the relationship between students' alexithymia and communication skills and their sociodemographic characteristics.

Table 3: Comparison of participants' sociodemographic characteristics and TAS (20) Scores (N=140)

Variables	Difficulty Identifying Feelings		Difficulty Identifying Feelings		Difficulty Identifying Feelings		Toronto Alexithymia Scale (TAS-20)	
	Mean (SD)	Test Value p-value	Mean (SD)	Test Value p-value	Mean (SD)	Test Value p-value	Mean (SD)	Test Value p-value
Gender*								
Women	16.19 (5.74)	-1.424 0.157	13.68 (3.13)	-2.258 **0.026**	24.54 (3.73)	-3.300 **0.001**	54.42 (9.11)	-3.053 **0.003**
Men	18.53 (4.52)		15.69 (2.01)		28.07 (2.95)		62.30 (5.67)	
Grade**								
1st	17.21 (6.17)		13.63 (3.51)		24.86 (4.43)		55.71 (10.38)	
2nd	15.85 (5.21)	0.483	13.85 (2.67)	0.343	25.78 (3.25)	1.649	55.50 (7.16)	0.224
3rd	16.67 (5.92)	0.695	13.64 (3.22)	0.791	23.67 (4.24)	0.181	54.00 (10.26)	0.879
4th	15.88 (5.38)		14.25 (2.93)		25.13 (3.03)		55.27 (8.44)	
When you think about your social relationships after the restrictions in the Covid-19 pandemic, how would you describe your interpersonal relations?**								
[a]I think my interpersonal relations were good.	15.28 (5.56)	4.861 **0.009** **a-b p=0.008**	13.45 (3.20)	3.987 **0.021** **a-b p=0.016**	25.66 (3.65)	4.712 **0.017** **a-c p=0.016**	54.40 (9.51)	2.670 0.073
[b]I think my interpersonal relations were bad.	19.26 (4.47)		15.47 (2.67)		24.39 (2.85)		59.13 (6.29)	
[c]Neutral	16.95 (5.93)		13.75 (2.86)		23.62 (4.24)		54.32 (9.33)	

*Independent Sample T Test, **One-Way ANOVA, p<0.005, Post-hoc comparisons:Tukey

Table 4: Comparison of participants' sociodemographic characteristics and CSS Scores (N=140)

Variables	Communication principles and basic skills		Self-expression		Active listening and non-verbal communication		Willingness to communicate		Communication Skills Scale (CSS)	
	Mean (SD)	Test Value p-value	Mean (SD)	Test Value p-value	Mean (SD)	Test Value p-value	Mean (SD)	Test Value p-value	Mean (SD)	Test Value p-value
Gender*										
Women	41.89 (4.75)	2.883 **0.005**	15.86 (2.94)	0.478 0.663	25.37 (3.18)	0.634 0.527	19.46 (3.35)	-1.280 0.203	102.59 (11.34)	1.142 0.255
Men	37.92 (4.53)		15.46 (2.47)		24.76 (3.89)		20.69 (2.56)		98.84 (10.59)	
Grade**										
1st	42.15 (4.73)		15.39 (3.34)		26.13 (3.33)		19.15 (3.55)		102.84 (12.74)	
2nd	41.60 (4.82)	0.445	15.75 (2.64)	0.487	25.00 (3.57)	1.657	20.17 (3.00)	0.530	102.53 (12.00)	0.093
3rd	41.54 (5.15)	0.721	16.00 (2.46)	0.692	24.45 (3.12)	0.179	19.45 (3.61)	0.662	101.45 (10.51)	0.964
4th	40.90 (4.85)		16.13 (2.96)		25.41 (2.93)		19.65 (3.06)		102.11 (10.32)	
When you think about your social relationships after the restrictions in the Covid-19 pandemic, how would you describe your interpersonal relations?**										
[a]I think my interpersonal relations were good.	42.09 (4.68)	1.209 0.302	16.84 (2.55)	12.969 **<0.001** **a-b p=<0.001** **a-c p=<0.001**	25.98 (3.21)	3.820 **0.024** **a-c p=0.047**	20.80 (2.61)	14.541 **<0.001** **a-b p=<0.001** **a-c p=<0.001**	105.72 (10.59)	9.333 **<0.001** **a-b p=0.002** **a-c p=0.003**
[b]I think my interpersonal relations were bad.	40.56 (4.43)		14.08 (2.31)		24.47 (2.48)		17.60 (2.79)		96.73 (7.20)	
[c]Neutral	41.00 (5.36)		14.87 (3.06)		24.50 (3.46)		18.35 (3.79)		98.72 (12.32)	

*Independent Sample T Test, **One-Way ANOVA, p<0.005, Post-hoc comparisons:Tukey

Table 5: Relationship Between TAS-20 and CSS Scores (N=140)

Scales		Difficulty Identifying Feelings	Difficulty Describing Feelings	Externally-Oriented Thinking	Toronto Alexithymia Scale
Communication principles and basic skills	r	-.188*	-.048	.129	-.079
	p	**0.026**	0.577	0.129	0.353
Self-expression	r	-.378**	-.387**	.246**	-.264**
	p	**0.000**	**0.000**	**0.003**	**0.002**
Active listening and non-verbal communication	r	-.158	-.112	.236**	-.038
	p	0.063	0.188	**0.005**	0.659
Willingness to communicate	r	-.340**	-.199*	.284**	-.161
	p	**0.000**	**0.019**	**0.001**	0.058
Communication Skills Scale (CSS)	r	-.323**	-.210*	.269**	-.159
	p	**0.000**	**0.013**	**0.001**	0.060

*Pearson Correlation Coefficient, * Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).*

In the research, it was determined that the Toronto Alexithymia Scale mean score of the participants was 55.15±9.12. In this sense, it can be said that nursing students experience moderate alexithymia. In many studies in the literature, it is seen that the alexithymia levels of nursing students are similar to the findings of this study (1,3,6,8,18,23). It is seen that some of these studies in the literature were carried out during the pre-pandemic period, and some during the period when the pandemic and restrictions were applied. In this regard, the findings of the study suggest that there is no change after the pandemic. Recognizing, perceiving, and expressing emotions, as well as understanding the emotions of others, are especially important in the nursing profession. This circumstance is comparable to excellent communication abilities (3,8). The high level of emotional awareness of healthcare professionals helps them to establish a respectful therapeutic relationship by allowing them to deeply understand the emotions of the healthy/sick individual they care for (8). It is recommended to conduct interventional and longitudinal studies in which awareness sessions are structured to recognize students' emotions.

In the research, it was determined that the communication skills scale mean score of the participants was 102.25±11.29. This result can be interpreted as the communication skills of nursing students are at a good level. In the literature, it is seen that the communication skills levels of nursing students are average (8,9,23,24). This current situation can be interpreted as a desirable and pleasing result. It is thought that the low level of alexithymia and high communication skills in nursing students are important for patient-centered care in the future. Bdair performed qualitative research on nursing students during the pandemic time; in all four themes, the students said that they had problems engaging with other students and instructors due to the constraints (25). All over the world, courses on communication skills are included in the content of different courses in nursing curricula. However, it is stated in the literature that students state that there are inconsistencies between communication education in the classroom and real communication needs in clinical practice (26-28). In this respect, it can be concluded that it is important to support quantitative research on the subject with qualitative research. There are studies stating that training planned on communication is effective for effective communication skills (13). However, there are also studies showing that the theoretical education given has no effect on communication skills (17). In a systematic analysis, Gutiérrez-Puertas et al. found that simulation was successful in enhancing communication skills with patients in the majority of the research reviewed (12). These findings indicate that practice is critical in the application of theoretical knowledge. It is advocated in the literature to adopt creative initiatives targeted at teaching communication skills and emotional awareness to the next generation of nurses in the nursing education curriculum (27-30).

When the sociodemographic characteristics of the participants were compared with the Toronto Alexithymia Scale; it was determined that male students had more difficulty in putting their feelings into words and their mean scores of extroverted thinking were higher. In the literature, it is stated that the emotional brain of women is more developed, and therefore, women's alexithymia levels are lower than men's (1,8,31). However, in a study conducted with nursing students; it was stated that there was no difference in the level of alexithymia between the genders, but the level of alexithymia increased in the last years of my nursing education. In the same study, it was stated that students who were not trained in the management of emotional care burdens could use alexithymia as a defense mechanism (16).

When the sociodemographic characteristics of the participants were compared with the Communication Skills Scale; it was found that female students scored higher in communication principles and basic skills sub-dimensions. There are studies in the literature that are similar to the findings of this study (8,21,31). There are also studies showing that there is no difference between both genders (6,9). In the literature, this difference is explained by socialization and gender role expectations. However, communication skills can vary from culture to culture and between men and women in every culture or subculture (21). In line with the findings of this study, it is thought that it is necessary to investigate more cultural gender differences regarding both human relations and emotions.

With the Toronto Alexithymia Scale, it was determined that the participants who evaluated their interpersonal communication as bad after the pandemic period restrictions had more difficulty in recognizing and expressing their emotions. In similar studies, it was stated that alexithymia may be a risk factor in causing interpersonal problems (6,32). It was found that students who evaluated their interpersonal communication as good after the restrictions during the pandemic period had higher Communication Skills Scale total score and sub-dimension score averages. In another study conducted by Aksoy and Çoban (2017) on nursing students regarding the pre-pandemic period, it was determined that there was a question in the data form about "having problems in interpersonal relationships" and that 70% of the participants did not experience any problems (6). Similarly, in a study conducted by Sancar and Aktaş (2019) with 634 nursing students during the pandemic period, 61.8% of students describe their interpersonal communication as good (8).

The study's findings show that nursing students who struggle to describe their emotions may also struggle with communication skills. Communication entails both the communication of knowledge and the transmission of emotions (13,33). In the literature, the emotional awareness of nursing students is associated with self-confidence in future care and the ability to develop new attitudes in the face of events. In addition, it is stated that nursing students who have effective communication skills should have self-awareness in order to create a therapeutic environment (24). It is predicted that epidemics and natural disasters will continue in the world due to the deterioration of the ecological balance. It is stated that best practices should be utilized while developing the nursing curriculum to prepare for the periodic emergence of infectious diseases worldwide and to train nurses to care for critically ill patients (12,29,30,33,34,35). For this reason, it is thought that it is important to integrate innovative applications such as virtual reality, in-situ simulation, and visual intelligence education into the curriculum and to plan evidence-based research on the subject in nursing education on emotion awareness and communication.

Conclusion and Implications for future research

According to our findings, nursing students had high communication skills and moderate alexithymia following the pandemic period constraints. Positive patient outcomes and patient satisfaction have been linked in the research with emotional awareness and effective communication (10). These research findings have implications for both nursing students and nurse educators. Research findings can be interpreted by looking at the general process before, during and after the pandemic. In this sense, it is thought to contribute to the literature. It is thought that another important issue for nursing education during the pandemic period is both the change of generations and the development of teaching methods. In this regard, it is advised to use qualitative data to supplement quantitative findings on alexithymia and communication abilities, which are crucial for treatment. Also, conducting long-term research on alexithymia in nursing students is recommended. In this approach, research planning might direct the development of new projects or the content for already-existing courses in the curriculum. It is suggested that this study be expanded to include other health practitioners. In addition, repeating the research on other campuses may strengthen the generalizability of the results. Finally, alexithymia and communication skills are concepts that can be affected by many factors. In this sense, it is recommended that studies be conducted that examine the predictive factors for these concepts in nursing students.

Ethics Committee Approval: This study was approved by the ethics committee of Acıbadem university (Date: 03.12.2021 & No: 2021/23).

Informed Consent: Written consent was obtained from the participants.

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RESEARCH ARTICLE
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Validity and Reliability of the Turkish Version of the Acute Coronary Syndrome Response Index

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ABSTRACT

Objective: This research was conducted to determine the validity and reliability of the Turkish version of the Acute Coronary Syndrome (ACS) Response Index, which is used to evaluate patient's knowledge, attitudes, and beliefs about the symptoms of ACS.
Materials and Methods: The methodologic study was conducted between March-October 2015 in a cardiology service of a research university and constitutes a sample of 165 patients who were diagnosed as having ACS. For linguistic validation, an expert panel of six academicians was formed, with the Turkish form being finalized according to their recommendations. Confirmatory factor analyses were performed for the construct validity.
Results: The Kuder-Richardson 20 formula for the first subscale was determined as 0.73, and Cronbach's alpha of reliability was 0.83 for the second subscale and 0.66 for the third subscale. The test was repeated to evaluate the invariance of the scale and its subscales with respect to time, with no difference being determined between the two implementations ($p > 0.05$).
Conclusion: The Turkish version of the ACS Response Index has been found to be a valid and reliable tool for the Turkish population.

Keywords: Acute coronary syndrome, reliability, validity, treatment delay

INTRODUCTION

Significant improvements have been made in the treatment and care of acute coronary syndrome (ACS) in recent years, and mortality rates due to ACS have been reduced significantly. However, ACS remains one of the leading causes of death worldwide. Survival rates are in line with the patient's early recognition of symptoms, admission to hospital, and initiation of treatment as soon as possible (1-3), due to most deaths occurring within the first few hours after the onset of symptoms (4). For most patients, the time between symptom onset and treatment initiation is quite long. The average delay time ranges from 1.6 to 12.9 hours (4-6). Approximately 50% of these deaths occur within the first hour after the onset of symptoms prior to hospital arrival. With a 30-minute delay, the 1-year mortality risk increases by 7.5% (7).

Patients' knowledge, attitudes, and beliefs about the symptoms of ACS are the most important determinants of delayed medical treatment (8). Delay from the onset of symptoms to the onset of reperfusion therapy has three main components. The first is the time between the onset of symptoms and the patient's decision to receive medical treatment. Most studies show that 50% of the patients eligible for reperfusion therapy do not report their symptoms within the first three hours. The second reason for treatment delay is the time to reach the hospital. This can vary from 15 to 90 minutes depending on the regional infrastructure, the distance to the nearest hospital, and the time at which the event took place. The third element of treatment delay includes the time between arrival at the hospital and the start of treatment. In this process, the first evaluation is made by the emergency department physician. Electrocardiography (ECG) recording and interpretation

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includes laboratory tests, further evaluation by a specialist cardiologist, and transfer from the emergency department to a coronary intensive care unit. However, the largest delay in the process constitutes the time that elapses between the patient deciding to receive medical treatment and the onset of symptoms (2). When examining the literature, the most important factors regarding this delay were found to be that patients did not know the symptoms and were inadequate in terms of seeking emergency help (9-12).

In this context, Riegel et al. (1) developed the ACS Response Index in 2007 with the aim of evaluating the knowledge, attitudes, and beliefs of patients with ACS regarding their symptoms. The aim of the present study is to demonstrate the usability of the ACS Response Index by performing its validity and reliability study for Türkiye.

MATERIALS AND METHODS

Purpose and type of research

The study aims to adapt the ACS Response Index, which evaluates patients' knowledge, attitudes, and beliefs about ACS, to Turkish and to assess the validity and reliability of the scale.

Population and sample type of research

The population of the study consists of patients with ACS who were followed up in a cardiology polyclinic of an education and research university between March and October 2015. When adapting a scale from one culture to another, the validity and reliability studies of the scale are recommended to have a sample size that is at least five times the number of items on the scale or performing the factor analysis and to have at least 30 pairs of data in order to perform the test-retest evaluation (13). In this context, it is aimed to reach 165 patients according to the number of 33 items in the study. The study has included 167 patients with ACS who speak Turkish, have had no comprehension problems affecting their perception of questions, and are over 18 years old.

Data collection

The forms were administered to patients who met the selection criteria through face-to-face interviews. The interviews were conducted in a room in which patients are hospitalized for cardiology-related issues. A second interview was conducted with 29 patients from the same sample group at test-retest intervals of 15-20 days (13-15). In order to collect information about their personal characteristics and diseases, a patient information form and the ACS Response Index were applied to the patients. The patient information form addresses two headings: sociodemographic characteristics and disease characteristics. The sociodemographic characteristics section asks questions about age, gender, marital status, educational status, employment status, occupation, social security, and income level. The section on information about the disease includes questions about the type of disease, time since diagnosis, interventions performed, and risk factors. The 33-item ACS Response Index includes three subheadings for assessing the knowledge, attitudes, and beliefs of patients with ACS. The knowledge section contains 21 two-choice statements about the common symptoms of ACS (15 items) and symptoms not associated with ACS (6 items). The attitudes section has five items about patients' awareness of the symptoms of ACS (3 items) and cases about requesting assistance (2 items). The attitudes section evaluates responses on a 4-point Likert-type scale (1= I am not at all confident, 2 = I am a little confident, 3 = I am quite confident, 4 = I am very confident). The beliefs section has seven items, four for evaluating patients' expectations and three for evaluating their actions. The beliefs section also evaluates the answers on a 4-point Likert-type scale (1 = strongly agree, 2 = agree, 3 = disagree, and 4 = strongly disagree). The data collection forms take an average of 10-15 minutes to complete.

Stages of the ACS response index validity and reliability study

Linguistic and content validity

The language and translation studies of the scale were performed as follows in accordance with the literature (16);

The scale was translated from English to Turkish by two independent individuals with a mastery of both languages.

The two translations were combined and reconciled by two native English speakers through consensus.

The combined translation was then back-translated from Turkish to English by a translator who is fluent in both languages.

The original English scale was compared with the back-translated scale. The scale was also examined by six faculty members in terms of the appropriateness and scope of the translation. Experts were asked to evaluate the suitability and comprehensiveness of each scale item according to a content validity index (CVI) by giving a score from 1-4 (4 = very appropriate, 3 = very appropriate but requires some minor change, 2 = barely appropriate, expression requires revision, 2 = not appropriate). The CVI value regarding the scale was calculated as 0.97. The proposals were evaluated by experts, and then the scale was finalized.

After receiving expert opinions, the final form of the scale was pre-applied to a group of 15 people included in the study. As each item was found to be understandable in the pre-application, no change was made to the scale.

Ethical consideration

This research was approved by the Clinical Research Ethical Committee of the Institute of Cardiology on February 20, 2015 through Approval No: 50.0.05.00/3. Informed consent was obtained from all patients who were willing to participate in the study. The study was conducted according to the Helsinki Declaration. Permission for using the scale in this research was obtained from the scale's developer, Dr. Barbara Riegel.

Statistical analysis

The programs Statistical Package for the Social Sciences (SPSS) version 21.0 (IBM, Armonk, N.Y., USA) and LISREL 8.80 for

Table 1: Demographic and clinical characteristics of the participants (N=167)

Patients	n	%
Age (X±SD)	167	59.98±11.50
Sex		
Male	117	70.1
Female	49	29.3
Education		
Literate	21	12.6
Primary Education	104	62.3
High School	26	15.6
University	15	9
Marital Status		
Married	132	79
Single	12	7.2
Widow/Divorced	23	13.8
Employment Status		
Retired	80	47.9
Civil servant	7	4.2
Worker	15	9
Self-employment	24	14.4
Housewife	32	19.2
Jobless	6	3.6
Others	3	1.8
Income		
High	12	7.2
Middle	137	82
Low	18	10.8
Health Insurance		
Yes	159	95.2
No	8	4.8
Duration of diagnosed		
≤5 years	112	67.1
>5 years	55	32.9
ACS type		
USAP	68	40.7
NSTEMI	61	36.5
STEMI	38	22.8
Medical History		
Angiography	136	81.4
Stent	93	55.7
By-pass	37	22.2
BMI (mean±SD, Min-Max)	28.54±5.23	17.7-47.7

ACS: Acute Coronary Syndrome, USAP: Unstable Angina Pectoris, NSTEMI: Non-ST-elevation myocardial infarction, STEMI: ST-elevation myocardial infarction, BMI: Body Mass Index, SD: Standard Deviations

Windows (IL, USA) were used for statistically analyzing the data obtained in the study. Confirmatory factor analysis (CFA), Kuder-Richardson 20 (KR-20) formula and Cronbach's alpha technique for validity and reliability, the Spearman correlation analysis, and goodness of fit were used to evaluate the study data.

RESULTS

When examining the relationship between the scores obtained from the two applications, the test-retest reliability coefficients were found to be 0.73 for the knowledge dimension, 0.83 for attitudes, and 0.94 for beliefs. Correlation coefficients greater than 0.70 are considered to indicate the scale to be invariant with time (Table 2).

The first subscale includes questions about knowledge, and its item-total correlations range between 0.12-0.46. The reliability of the measurement (KR-20) was calculated as 0.73 (Table 3).

For the attitude subscale, the corrected item-total correlations range between 0.54-0.71 (Table 4), with Cronbach's alpha being calculated as 0.83.

The beliefs subscale's corrected item-total correlations range between 0.01-0.63 (Table 4). In addition, Cronbach's alpha of reliability was 0.66, which increased to 0.74 when removing Item 30 from the test. Most items had Cronbach's alpha values greater than 0.70, though some were less than 0.70.

In order to investigate the relationships between the items of the scale, the item-total score correlations for the three dimensions were calculated separately. When examining the item-total score correlation for the subscale of knowledge, the correlation coefficients for the items were found to range between 12-46 (Table 3). The item-total correlations were determined between 0.54-0.71 for the attitudes subscale and between 0.01-0.63 for the beliefs subscale (Table 4).

Table 5 presents the goodness-of-fit indices of the two-dimensional theoretical model. In addition, when examining the factor loadings and the correlations between the factors, the error variance for Item 5 was seen to be negative (Heywood case), and the factor correlation matrix could not be defined positively due to the low number of observations, the high number of parameters, and the nearly constant scores for Item 5. Factor loads related to the information dimension ranged between 0.16-1.06. The average variance explained by the knowledge dimension was found to be 0.32 and the construct reliability coefficient to be 0.87. Due to Items 1, 3, 7, 9, 15, and 19 being reverse scored, they were found to have negative charges, as expected.

The goodness-of-fit indices of the two-dimensional theoretical model for the attitudes subscale are provided in Table 5 and shown to be acceptable. In addition, the chi-square difference test shows the attitudes toward ACS to have sub-factors and to not be one-dimensional (delta chi-square = 12.08 and 42.75).

Table 5 provides the goodness-of-fit indices for the belief subscale regarding the two-dimensional theoretical model. In addition, the difference between the one-dimensional model is statistically insignificant. The correlation between the factors is 0.91. The confidence interval for this coefficient was calculated as 0.91 ± 1.96 * 0.06 = 0.79 - 1.03. The fact that the confidence

Table 2: Test-Retest Correlation Coefficients (n=29)

Sub-scale	Spearman correlation coefficient
Knowledge	0.73
Attitude	0.83
Belief	0.94

Table 3: Knowledge Subscale Item-Total Statistics

Items	Item difficulty index (p)	Item discrimination index (r)	Point by serial correlation	Adjusted point by serial correlation
Pain in the lower abdomen	0.16	0.16	0.23	0.13
Arm and shoulder pain	0.77	0.53	0.55	0.46
Arm paralysis	0.13	0.23	0.33	0.25
Backache	0.66	0.59	0.50	0.39
Pain/Pressure/Impingement in the chest	0.93	0.18	0.31	0.25
Chest discomfort (heaviness/burning/tendernes)	0.65	0.49	0.37	0.25
Cough	0.26	0.22	0.24	0.12
Dizziness	0.40	0.46	0.43	0.31
Headache	0.26	0.35	0.37	0.26
Heartburn / Indigestion / Stomach problem	0.41	0.37	0.33	0.20
Jaw pain	0.16	0.21	0.25	0.15
Unconsciousness / fainting	0.24	0.43	0.47	0.37
Nausea / vomiting	0.44	0.41	0.31	0.18
Neck pain	0.40	0.51	0.46	0.35
Arm and hand numbness / tingling	0.65	0.60	0.56	0.46
Pale, ash color skin, discoloration / loss	0.27	0.26	0.36	0.24
Palpitations / heart rate increase	0.60	0.56	0.51	0.40
Shortness of breath / difficulty in breathing	0.63	0.56	0.51	0.40
Speech deterioration	0.27	0.49	0.44	0.33
Sweating	0.81	0.19	0.28	0.18
Weakness/Fatigue	0.83	0.38	0.50	0.42
Knowledge Dimension internal consistency value (KR-20)		**0.73**		

KR-20: Kuder- Richardson 20

Table 4: Attitude and Belief Dimension Size Item Total Statistics

	Items	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's alpha if item deleted
Attitude Dimension **Cronbach's alpha value: 0.83**	22.How sure are you that you can recognize someone else's heart attack signs and symptoms?	10.11	7.58	0.66	0.78
	23.How sure are you that you can recognize the signs and symptoms of heart attack in yourself?	9.31	7.53	0.71	0.77
	24.How sure are you that you can distinguish between signs and symptoms of heart attack and other diseases?	9.80	7.71	0.67	0.78
	25.How sure are you that you can ask for help for someone you think has a heart attack?	10.10	8.57	0.54	0.82
	26.How sure are you that you can seek help if you think you have a heart attack?	9.47	8.67	0.55	0.81
Belief Dimension **Cronbach's alpha value: 0.66**	27.If I have a chest pain not exceeding 15 minutes, I should go to the hospital as soon as possible.	18.95	6.40	0.46	0.61
	28.If I thought I had a heart attack and went to the hospital, I would be ashamed if it turned out I didn't have a heart attack.	19.00	6.18	0.37	0.63
	29.If I think I'm having a heart attack, I'll wait until I know for sure before I go to the hospital.	19.39	5.50	0.49	0.59
	30.If I think I'm having a heart attack, I'd rather have someone take me to the hospital instead of the ambulance coming to my house.	20.06	7.42	0.01	0.74
	31.Because of my treatment costs, I would like to be absolutely sure that I am having a heart attack before going to the hospital.	19.16	6.27	0.35	0.63
	32.If I have chest pain and I am not sure that it is a heart attack, I have to go to the hospital.	19.11	6.23	0.50	0.60
	33.If I think I have a heart attack, I'll go to the hospital right away.	18.81	6.31	0.63	0.58

Table 5: CFA Results of the Subscales

	Model	S-Bχ2	SD	*p*	$\frac{\chi 2}{SD}$	CFI	RMSEA	SRMR	Δχ2
Knowledge Subscale	**Two-dimensional Model**	331.30	188	<.001	1.76	0.95	0.07 (0.06 - 0.09)	0.18	
	One-dimensional Model	264.69	189	<.001	1.40	0.97	0.07 (0.06 - 0.09)	0.18	$66.61_{(1)}$
	Alternative Model	284.61	170	<.001	1.67	0.95	0.06 (0.05 - 0.08)	0.14	
Attitude Subscale	**Two-dimensional Model**	3.37	4	0.07	0.84	1.00	0.00 (0.00 - 0.11)	0.02	
	One-dimensional Model	15.45	5	<.001	3.09	0.98	0.11 (0.01 - 0.16)	0.06	$12.08_{(1)}$
	Unrelated Two-Dimensional Model	46.12	5	<.001	9.22	0.92	0.22 (0.17 - 0.28)	0.30	$42.75_{(1)}$
Belief Subscale	**Two-dimensional Model**	10.09	13	0.69	0.78	1.00	0.00 (0.00 - 0.06)	0.05	
	One-dimensional Model	11.14	14	0.67	0.80	0.98	0.00 (0.01 - 0.06)	0.05	$1.05_{(1)}$
	Two-dimensional Model (Except S30)	46.99	14	<.001	3.36	0.94	0.12 (0.08 - 0.16)	0.25	$36.9_{(1)}$

interval covers the value of 1.00 and the correlation between the factors is greater than 0.80 indicates the belief dimension to be a single factor. The factor loads related to the belief dimension vary between 0.01-0.95. The factor load for Item 30 in the belief subscale is close to zero, which means the item measured a property other than the structure the test wants to measure. Upon removing item 30 and repeating the factor analysis, the following results were found: *χ^2 = 4.27, p=0.83, CFI = 1.00, RMSEA = 0.00 (0.0-0.05), and SRMR = 0.03 (Table 5)*.

DISCUSSION

The study analyzed the sub-dimensions of the scale and evaluated goodness-of-fit indices using CFA. In terms of the chi-square, *R*MSEA, and *S*RMR as the most used criteria of goodness-of-fit indices, the general fit coefficients related to the two-dimensional theoretical model have been found to be sufficient except for the *S*RMR. *S*RMR is defined as the standardized difference between the observed and predicted correlations (17). According to Kenny (18), *S*RMR is positive, and these biases increase when the number of participants and standard deviation is low. Marsh and Balla (19) stated *S*RMR to be sensitive to sample size and should not be used. Hu and Bentler (20) argued that *S*RMR should be used while also specifying *S*RMR to be the most sensitive index for models in which factor covariances are misidentified. On the other hand, Kenny (19) proposed that general compliance coefficients indicate a model with high all-parameter estimates to perhaps be invalid or to indicate an inaccurately defined model; however, a model with a false sign and poor separation validity or a model of a Heywood case might have high coefficients of fit. Crowley and Fan (21) argued that no golden rule exists for evaluating a model's goodness-of-fit indices because each index reflects a different aspect of the model fit; they stated that model fit should be evaluated based on a series of indices. From this point of view, because most of the indices show an acceptable level of fit, the fit of the theoretical model is assumed to be sufficiently high.

However, when examining the loadings of the factors related to the theoretical model and the correlations between the factors, the error variance for Item 5 was found to be negative (Heywood case), and the factor correlation matrix could not be defined positively due to the low number of observations, the higher number of parameters, and the nearly constant scores for item 5. The Heywood case factor variance is greater than 1, and therefore the error variance is less than 0. The causes of Heywood cases include factors such as subtracting too many factors from the data and low sample size. When considering these reasons, the one-dimensional model was tested and upon examining the results, the average score for item 5 was found to be 0.93. In other words, only 11 out of 167 patients responded "no" for Item 5 (0 points), while 156 responded "yes" (1 point). Item 5 was excluded from the data set because the patients showed little variance caused by the Heywood case. The analysis was then repeated, and the general fit coefficients for the alternative model were evaluated. The alternative model has goodness-of-fit indices that are close to the previous models and acceptable apart from the *S*RMR, but the factor correlation matrix did not contain a positive definition or a Heywood case problem. However, due to item 5 being considered as one of the most important indicators of ACS, excluding this item from the scale was thought to be able to reduce the validity of the scope. Thus, it was not eliminated from the data set. In this case, one can say the scale should be considered to be a one-dimensional rather than a two-dimensional model. In the CFA of the one-dimensional model, χ^2 was calculated as 264.69; *CFI* = 0.97, *RMSEA* = 0.07, and *SRMR* = 0.18.

CFA was applied to the attitudes subscale and its two sub-dimensions, and the goodness-of-fit indices for the two-dimensional theoretical model were found to be acceptable. In addition, the chi-square difference test showed attitudes toward ACS to consist of sub-factors and to not be one-dimensional ($\Delta\chi^2$ = 12.08 and 42.75). As a result of the CFA applied to the beliefs subscale and its two sub-dimensions, the general fit coefficients of the two-dimensional theoretical model were seen to meet the criteria of Hair et al. (22). However, when examining the factor loadings regarding the beliefs subscale, the factor load for Item 30 was seen to be close to zero (0.01). The factor load value explains the relationship the items have with the factors. The lower limit

value for a factor load is generally required to be above 0.30 (13). The fact that the factor load for Item 30 = 0.01 indicates that it measures a feature other than the structure the test intends to measure. Upon removing item 30 and repeating the factor analysis, serious deteriorations were seen to occur in the fit indexes (χ^2 = 46.99; *p< 0.001*; χ^2 = 3.36; *CFI* = 0.94; *RMSEA* = 0.12; *S*RMR = 0.25, and $\Delta\chi^2$ = 36.9). Therefore, the observation was made that Item 30 should not be omitted and that the one-dimensional model with no statistically significant difference between the two-dimensional model gives better results when examining the relationships between the items. Thus, using the model in one dimension would be more accurate.

In the study, the KR-20 internal consistency reliability coefficient for the knowledge subscale is 0.73. Cronbach's alpha of internal consistency is 0.83 for the attitudes subscale and 0.66 for the beliefs subscale. Riegel et al. found an internal consistency reliability of 0.82 for the information subscale, of 0.71 for the attitudes subscale, and of 0.74 for the beliefs subscale (1). As a result, when comparing the validity and reliability data to the original scale, the reliability coefficients are found to be similar.

In order to investigate the relationship between the items of the scale, the item-total score correlations were calculated separately for the three subscales. When examining the item-total score correlations, the correlation coefficients of the items are found to vary between 0.12-0.46 for the knowledge subscale, between 0.54-0.71 for the attitudes subscale, and between 0.01-0.63 for the beliefs subscale. Apart from item 30, the items' contributions to the subscales and total score are found to be statistically acceptable.

A test-retest analysis was performed with 29 people after 15 days to evaluate the invariance of the test over time. This part of the study found the Spearman correlation coefficients to vary between 0.73-0.94. Because of the high test-retest correlations in this study, the scale can be said to have the property of providing similar measurement values upon repeated measurements and therefore to be consistent.

Study limitations

The study was conducted at a single center and as such cannot be generalized to all patients with ACS.

CONCLUSIONS AND RECOMMENDATIONS

Among the symptoms in the information dimension, the assessment of the item concerning chest pain/pressure/impingement using CFA showed the error variance to be negative and the factor correlation matrix to not be definable in the positive direction. The factor load was calculated as 1.06, and the average item score was 0.93. However, because the item is one of the most important indicators of ACS, excluding it from the scale may reduce the scope validity. In this case, the recommendation is to use a one-dimensional model with better fit indexes than the two-dimensional model and to apply wrong symptoms using reverse coding. The CFA for the belief dimension revealed the factor load for item 30 to be 0.01 (< 0.30), which indicates that this item measures a property other than the structure the test intends to measure. Upon removing the item and repeating the factor analysis, the fit indices were seen to deteriorate. Therefore, the suggestion was made to use the model as one-dimensional model by not omitting Item 30 due to no statistically significant difference occurring between the one- and two-dimensional models and the one-dimensional model providing better results when examining the relationships between items. As a result, the ACS Response Index has been found to be a reliable tool. Improvement studies can be suggested in terms of construct validity, and the scale can also be recommended for use in future studies.

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RESEARCH ARTICLE
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Senior Nursing Students' Assessment of the Physical Health Status of Patients Diagnosed with Mental Disorders

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ABSTRACT

Objective: This research was carried out to examine senior nursing students' assessment of the physical health status of individuals diagnosed with mental disorders.
Material and Methods: The study was carried out using a descriptive and retrospective design to examine the clinical practice forms of 118 students who performed the clinical practice of Mental Health and Diseases Nursing in the nursing departments of two private universities in the 2021-2022 academic year. The clinical practice forms include patient demographics, patient history, mental state examination, daily living activities, treatment, laboratory findings, and nursing care plan.
Results: According to the clinical practice forms the students completed, the mean age of the cases they followed was 32.90 ± 12.35 years; of the patients, 62.7% were male (n = 74), and 46.6% were diagnosed with bipolar disorder (n = 55). All students were determined to have evaluated patients' vital signs and height and weight; however, 73.7% did not evaluate pain. The area the students were determined to have evaluated most in terms of daily living activities was sleeping activity and the area they evaluated least to be sexual activity.
Conclusion: The need exists to develop senior nursing students' practical skills as well as their theoretical knowledge on evaluating the physical health status of patients with mental disorders. By developing students' knowledge and skills, their self-confidence and motivation regarding physical examination will also increase. This is considered to be able to contribute to the holistic evaluation of patients.
Keywords: Nursing students, physical health assessment, nursing care plan

INTRODUCTION

According to the Mental Health Atlas 2020 data published by the World Health Organization (WHO), at least one out of 4 adults in the world is diagnosed with a mental disorder (1). The literature review found the physical health of individuals who use both inpatient and community-based mental health services to be neglected for a variety of reasons (2,3). In this sense, one important issue for nurses working in mental health and psychiatric care settings is to improve individual's mental as well as physical health (4,5). As a result of many factors such as a sedentary lifestyle, low physical activity, poor eating habits, smoking, and alcohol consumption, people with mental disorders have a higher risk of physical disease, especially cardiovascular disease, compared to the general population (6-8).

Studies are found to have stated nurses who work in mental health and psychiatric care services to have positive attitudes and sufficient knowledge about physical health care (5,9). However, studies are also found to have stated nurses to experience role confusion and to perceive themselves as inadequate at evaluating physical health (10,11). Happell et al. (12), emphasized a lack of information to be found about the physical health of patients diagnosed with serious mental illness (SMI). A gap exists in practice, and evidence-based

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interventions should be planned in this regard. The obstacles to evaluating physical health parameters have been stated to include lack of time, sustainability, and the need for training (5,9,12,13). A recent study conducted in three Asian countries determined that nurses need training to meet the physical health needs of individuals with serious mental disorders. One result from the same research suggested that training provided by psychiatric nurses can meet this need (14). Another study conducted in Türkiye determined nurses who believe in the importance of patients' physical health to have higher levels of knowledge and self-confidence (11). Ince et al. (15) found nurses to believe that the physical health care provided to individuals with SMI is insufficient and to draw attention to the need to improve their knowledge and skills on the subject.

One issue that has become increasingly important in recent years involves nurses' roles, competences, and qualifications. Pursuant to Article 2b of Regulation on Amending the Nursing Regulation No. 27910 (2011) published in the National Gazette of Türkiye regarding the duties, authorities, and responsibilities in mental health and diseases nursing, a mental health and diseases nurse is obliged to make planned and regular meetings where the mental and physical health of the patients are evaluated and the problems of the patients are discussed in line with the planned nursing practices. In accordance with Articles 3d and 3f of the same regulation, nurses are to plan and conduct a health education to eliminate the deficiencies of the sick individual and to evaluate the effectiveness of the education (16). Oflaz et al. (17) found that most of the nurses working in mental health and psychiatric care services in Istanbul have a bachelor's degree or higher education level. From this point of view, the majority of nurses working in mental health and psychiatric care services throughout the Türkiye can be stated to have completed their undergraduate (i.e., Bachelor of Science in Nursing), and a graduate education (i.e., Master of Science in Nursing or doctorate degree) has great importance in the roles, competencies, and qualifications of nursing (18). A holistic approach is an important element in how undergraduate nurses assess the health needs of the individuals under their care (3,12). For this reason, importance is had in considering the knowledge and skills related to assessing the physical health of individuals diagnosed with SMI, both in psychiatric nursing undergraduate education as well as in in-service training.

One method for measuring the holistic evaluation of the needs of patients/healthy individuals in psychiatric nursing education involves case studies (19). Many countries have widely adopted case-based learning strategies in nursing education due to benefits such as having students develop reflective and critical thinking, improve their problem-solving skills, and take responsibility for self-learning (20,21). Case assignments are frequently used in psychiatric nursing education in Türkiye as one of the measurement and evaluation parameters and provide an opportunity to address patients' physical as well as mental health issues. Case-based learning strategies have been stated to have an important role in preparing students for the profession (19,21,22). The aim of this retrospective study is to examine senior nursing students' assessments of the physical health status of individuals diagnosed with mental disorders. The results that are obtained are though to be able to guide discussions about student awareness of the holistic approach to assessing both the mental and physical health of individuals diagnosed with mental disorders. The plan is to discuss proposals for solutions related to the current situation and the future by considering the results.

METHODS

Study design

This study was carried out using the retrospective design method in order to determine the level at which senior nursing students evaluate the physical health status of patients under their care during the clinical practice within the scope of their mental health and diseases course.

Research questions

- At what level do senior nursing students assess the physical health parameters of patients diagnosed with mental illnesses in accordance with the nursing process?
- What nursing diagnoses do senior nursing students evaluate when addressing the physical health characteristics of patients with mental illnesses as part of the nursing process?

Participants

The universe of this study consists of all the clinical case papers (N = 154) prepared by nursing students enrolled in the Mental Health and Diseases Nursing course in the fall semester of the 2021-2022 academic year at two private universities in Istanbul. The two private universities have the same course topics, case assignments, location, and clinical hours and different order of course topics, days, clinical practice instructors, and clinical practice days. All students also completed the same courses in previous semesters, such as the Fundamentals of Nursing course to learn how to prepare nursing care plans and the Interpersonal Communication in Nursing course to learn how to communicate with patients.

The sample consists of 118 students who perform clinical practice in mental health and psychiatric care services case papers (n = 118). The inclusion criteria are: being enrolled in the Mental Health and Diseases Nursing course in the 2021-2022 academic year, having clinical practice hours in mental health and psychiatric care services, having submitted completed case papers, and giving permission to include their case papers in this study. Of the students' case papers, 36 were excluded from the study due to having clinical practice hours in clinical areas of consultation such as liaison psychiatry or a psychiatric emergency ward as opposed to in-patient psychiatric care services and/or for submitting incomplete case papers.

Data collection

Once the researchers obtained the necessary permissions, the study went on to examine the case papers of students who'd completed the clinical practice section of the Mental Health and Diseases Nursing course and submitted their clinical practice forms during the 2021 fall semester.

Data collection tools

Data were collected from the clinical practice forms the students used during the course at the two universities. These clinical practice forms have been used as data collection tools based on Gordon's functional health patterns model (FHPM). Patient diagnosis and how nursing is conducted regarding the psychiatric clinical practice procedures are based on Gordon's FHPM (23). Patient diagnosis is based on the 13 functional health patterns defined in the FHPM. Data have been gathered regarding such areas as patients' sociodemographic factors, psychiatric history, mental state evaluation, daily living activities, therapies, and laboratory findings within the FHPM framework (23). The second step of the nursing process determines the patient's difficulties as based on the nursing diagnoses of the North American Nursing Diagnosis Association-International (NANDA-I) as produced by the North American Nursing Diagnosis Association (24). Throughout this evaluation, the Turkish translation of Carpenito-Moyet's *Handbook of Nursing Diagnosis* and the NANDA-I Taxonomy-II were utilized as guides (23,24).

Data analysis

The data for the study consist of 118 clinical case papers. The package program Statistical Package for Social Science (SPSS; ver. 28.0) was used for the statistical analysis of the data. The research uses means, standard deviations, percentages, and frequency distributions based on descriptive statistical methods.

Institutional permissions and ethics committee approval were obtained (Dated September 30, 2022; Permission No. 15/22). The necessary permissions were also obtained by giving information about the purpose and method of the research to the universities' nursing departments. The students' permissions for including their case papers in the study were also obtained on the last day of the course after they had submitted their cases.

Limitations

The findings from this study do not reflect the assessment status of all student nurses regarding physical health and are not generalizable.

RESULTS

Of the students, 75.4% (n = 89) are female and 24.6% (n = 29) are male. According to the clinical practice forms the students completed, the mean age of the cases they followed was 32.90 ± 12.35, with 62.7% being male. Of these cases, 46.6% were diagnosed with bipolar disorder, and only 5.9% were diagnosed with another comorbid psychiatric disorder.

All students were determined to have evaluated patients' blood pressure, pulse, body temperature, height, and weight. However, only 90.7% of the students were determined to have evaluated respiratory rate and 28.0% to have evaluated waist circumference. In addition, 26.3% of the students were determined to have evaluated patients' pain and 81.4% to have evaluated patients' allergies. The students also evaluated the patients' habits. Accordingly, 92.4% of students obtained information about smoking status, amount, and duration of use; 68.6% obtained information about alcohol use status, amount, and duration of use; and 61.9% evaluated information about substance use status, amount, and duration of use. The 60.2% of students evaluated comorbid physical disease, 14.4% evaluated drug use due to physical illness, and 48.3% evaluated previous surgical operation history (Table 1).

When examining the students' clinical practice forms, their laboratory findings, being an important point regarding patients' physical health status, were seen to cover various tests from liver function tests (AST, ALT, and GGT); lipid profile (total cholesterol, LDL, HDL, and triglycerides) and fasting or postprandial glucose value; and thyroid function tests (TSH, T3 and T4 levels), and vitamins D and B12 tests. Among these tests, more than half of the students evaluated patients' AST, ALT, GGT, total cholesterol, LDL, HDL, glucose, and TSH values (Figure 1). Of the students, 62.7 % were determined to have evaluated laboratory findings as being normal or abnormal and to have expressed the possible reasons for laboratory findings containing abnormal values.

According to the students' clinical practice forms regarding breathing activity, the students were seen to have evaluated respiratory rate per minute, depth of respiration, difficulty breathing, and external factors affecting respiration. Among these parameters, respiratory rate per minute was evaluated most frequently at 90.7%, with external factors affecting respiration being the least evaluated parameter at 61.9%. Regarding patients' eating and drinking activities, the students were seen to have evaluated weight gain/decrease status, number of main meals and snacks, carbohydrates, caffeine intake, liquids, vegetable/fruit consumption status, market shopping, and food preparation. The parameter students evaluated the most regarding patients' eating and drinking activities was the number of daily snacks and main meals at 55.1%, while their least evaluated parameter was daily carbohydrate consumption at 19.5%. With regard to eliminating body waste activity, the students were seen to evaluate the frequency, amount, and color of micturition and defecation; urine/fecal incontinence; number of times going to the toilet; diarrhea; and constipation status. More than 70% of students were observed to have evaluated the frequency, amount, and color of micturition and defecation, while only 63.6% were seen to have evaluated patients' constipation status (Table 2).

Table 1: Patient assessment statuses according to the clinical practice form by the students (N= 118)

Variables	n	%
Patients' Gender		
Female	44	37.3
Male	74	62.7
Patients' Psychiatric Disorder		
Bipolar Disorder	55	46.6
Depression	12	10.2
Schizophrenia and Psychotic Disorder (*Inorganic, Atypical, Postpartum, Substance-Induced*)	34	28.8
Substance Abuse	13	11.0
Obsessive-Compulsive Disorder	4	3.4
Habits Evaluation		
Smoking (*using, amount, duration, attempts to quit if any*)	109	92.4
Alcohol evaluation (*using, amount, duration, attempts to quit if any*)	81	68.6
Substance evaluation (*using, amount, duration, attempts to quit if any*)	73	61.9
Vital Signs Evaluation		
Blood Pressure	118	100.0
Heart Rate	118	100.0
Temperature	118	100.0
Respiration Rate	107	90.7
Comorbid Psychiatric Disorder		
Evaluated by students	7	5.9
Not evaluated by students	111	94.1
Body Measurements (height and weight)		
Evaluated by students	118	100.0
Not evaluated by students	0	0
Waist Circumference Measurement		
Evaluated by students	33	28.0
Not evaluated by students	85	72.0
Pain		
Evaluated by students	31	26.3
Not evaluated by students	87	73.7
Allergy		
Evaluated by students	96	81.4
Not evaluated by students	22	18.6
Comorbid Physical Illness		
Evaluated by students	71	60.2
Not evaluated by students	47	39.8
Medicine Used Due to Physical Illness		
Evaluated by students	17	14.4
Not evaluated by students	101	85.6
Past Surgical Operation		
Evaluated by students	57	48.3
Not evaluated by students	61	51.7

Regarding personal cleanliness and dressing activity, the factor the students evaluated the most was determined to be cleaning and arranging clothes at 89.0%, with the least evaluated factor being patients' routine dental examination status at 33.9%. As one of the health promoting practices in the mobilizing activity, 75.4% of students evaluated exercise status. Regarding the most comprehensively evaluated sleeping activity, the students were seen to have evaluated the parameters of sleep hours, difficulty falling asleep, sleep routine, restfulness upon waking, and waking up frequently at night. Of these parameters, students most commonly evaluated waking up frequently at night at a rate of 67.8 %, with the least commonly evaluated parameter (22.0%) being how many times patients wake up throughout the night. The least evaluated daily life activity was sexual activeness. While 19.5% of students were seen to have evaluated patients' satisfaction with sexual activity, 33.9% of students were seen to have evaluated patients' parameter of practicing safe sex. Apart from daily living activities, 21.2% of students were seen to have evaluated menstrual cycle (increase/decrease in bleeding, pain

Table 2: Evaluation of physical health in terms of daily living activities according to the clinical application form of the students (N=118)

Activities of Daily Living	Parameters Evaluated under Activities of Daily Living	Evaluated		Not Evaluated	
		n	%	n	%
Breathing	Respiratory Rate (*per minute*)	107	90.7	11	9.3
	breathing depth	49	41.5	69	58.5
	Difficulty in breathing	61	51.7	57	48.3
	Respiratory being affected by an external factor (*such as overweight or smoking, etc.*)	45	38.1	73	61.9
Eating food and drinking fluids	Weight gain/decrease in a short	50	42.4	68	57.6
	Number of main meals and snacks and per day	65	55.1	53	44.9
	Daily carbohydrate consumption	23	19.5	95	80.5
	Daily caffeine consumption	38	32.2	80	67.8
	Daily fluid consumption	60	50.8	58	49.2
	Daily consumption of vegetables and fruits	46	39.0	72	61.0
	Shopping (market etc.)	33	28.0	85	72.0
	Food preparation	44	37.3	74	62.7
Eliminating body wastes (Miction)	Frequency of going pee, amount, and color of urinary	95	80.5	23	19.5
	Urinary incontinence	71	60.2	47	39.8
Eliminating body wastes (Defecation)	Frequency of going defecation, amount, and color of defecation	87	73.7	31	26.3
	fecal incontinence	32	27.1	86	72.9
	Diarrhea	53	44.9	65	55.1
	constipation	75	63.6	43	36.4
Personal Cleansing and Dressing	Tooth brushing habit	89	75.4	29	24.6
	Going to the dental examination status	40	33.9	78	66.1
	Hair and body care (care routine)	98	83.1	20	16.9
	Hand and foot care status	50	42.4	68	57.6
	Clothes cleaning and arrangement	105	89.0	13	11.0
Mobilizing	Exercise status (*exercise routine, minute…*)	89	75.4	29	24.6
	The individual›s posture and need for an assistive device for movement	56	47.5	62	52.5
Sleeping	Sleep hours (*bedtime, wake-up time, average number of hours sleep…*)	80	67.8	38	32.2
	Difficulty falling asleep status	39	33.1	79	66.9
	Having a regular sleep routine	75	63.6	43	36.4
	Rested waking state	20	16.9	98	83.1
	Frequent waking at night	26	22.0	92	78.0
Expressing Sexuality	Satisfaction and level of satisfaction with sexual activity	23	19.5	95	80.5
	Safe sexual activity	40	33.9	78	66.1
Other screenings	For women: Menstrual cycle & Menopause	25	21.2	93	78.8
	For women: Pap Smear Test	28	23.7	90	76.3
	For men: Prostate Self-Exam	21	17.8	97	82.2
	For both men and women: Breast Self-Exam	27	22.9	91	77.1
	Eye Examinations	35	29.7	83	70.3

experience) and menopause symptoms (such as hot flashes, symptomatic drug use) and 23.7% to have evaluated smear screening tests. Of all students, 17.8% were seen to have evaluated prostate self-examination for men, 22.9% to have evaluated the performance of breast self-examination, and 29.7% to have evaluated patients' routine eye examinations (Table 2).

When examining the nursing diagnoses the students had determined for physical health in their nursing care plans in order of priority, disturbed sleep pattern was the most common first diagnosis at 48.1%, with self-care deficit being the second most common diagnosis at 32.8%. Imbalanced nutrition (i.e., consuming under or over body requirements) was the third most common nursing diagnosis at 25.6%. Without regard to order, the least defined nursing diagnoses were seen to be activity intolerance, pain (acute/chronic), and constipation (Table 3).

Table 3: Nursing diagnoses determined by students for physical health.

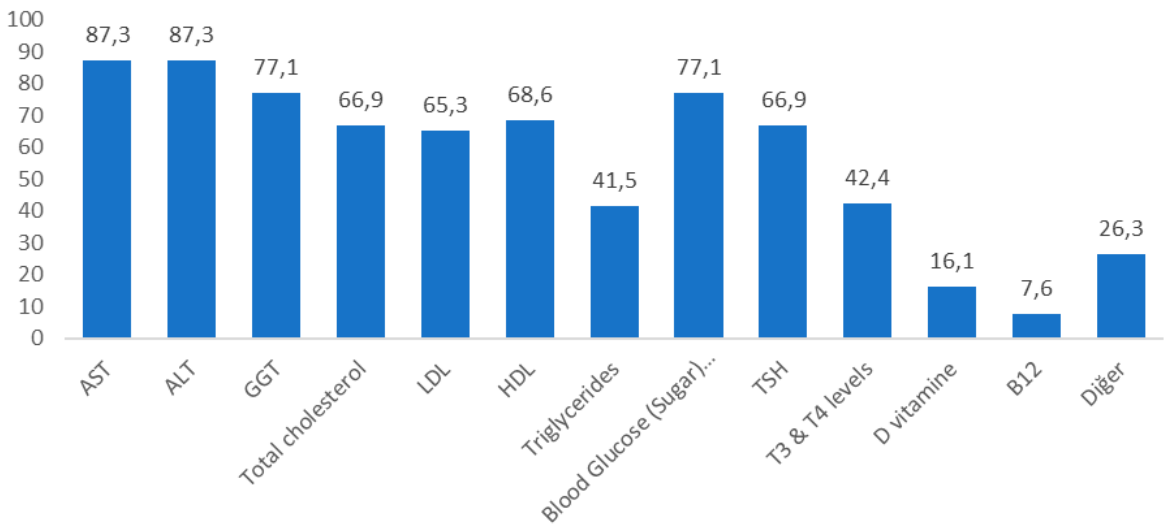
Nursing Diagnoses	1st Determined Nursing Diagnosis n %	2nd Determined Nursing Diagnosis n %	3rd Determined Nursing Diagnosis n %
Disturbed Sleep Pattern	50 (%48.1)	15 (%23.4)	8 (%20.5)
Self-Care Deficit	19 (%18.3)	21 (%32.8)	7 (%17.9)
Ineffective Health Maintenance	9 (%8.7)	2 (%3.1)	3 (%7.7)
Risk for Falls	8 (%7.7)	7 (%10.9)	3 (%7.7)
Imbalanced Nutrition: Less Than/More Than Body Requirements	8 (%7.7)	8 (%12.5)	10 (%25.6)
Constipation	3 (%2.9)	3 (%4.7)	1 (%2.6)
Risk for Electrolyte Imbalance	2 (%1.9)	3 (%4.7)	-
Pain (Acute/Chronic)	2 (%1.9)	1 (%1.6)	-
Fatigue	2 (%1.9)	2 (%3.1)	4 (%10.3)
Activity Intolerance	1 (%1.0)	-	-
Ineffective Sexuality Pattern	-	2 (%3.1)	3 (%7.7)

DISCUSSION

With regard to constant rapid changes in health, an individual's holistic bio-psycho-socio-cultural approach is the only component that will not change. Evaluating the physical health status of individuals with mental disorders has remained in the background (12,13). Dickens et al.'s (13) systematic review of studies involving 7,549 nurses in 14 countries, they defined the most significant barriers to mental health nurses' evaluation of physical health to be lack of confidence, skills, and knowledge. To change this situation, Insufficient studies are found to have examined the evaluations of nursing students in the vocational training (12).

The physical health status of individuals diagnosed with mental disorders is predicted to be affected in the long term due to disease symptoms, prognosis, drug use, and diagnosis of comorbid psychiatric disorder (12). Demir et al.'s (26) study found physical illness to be present in individuals with mental disorders at a rate of 51%, with this rate being 59% in Erginer's (27) study and 62% in Placentino et al.'s (25) study. However, the incidence of chronic physical diseases such as cardiovascular disease (CVD), hypertension, metabolic syndrome (MetS), and diabetes mellitus (DM) is higher in individuals with mental disorders compared to the general population and by age (26,28,29). All the student nurses were seen to have evaluated physical examination parameters such as blood pressure, pulse, body temperature, height, and weight, which are important in determining physical diseases. In addition to these parameters, having psychiatric nurses also evaluate respiratory rate, waist circumference, pain, allergy, and habits (i.e., smoking, alcohol, and drugs) is considered to be able to increase patients' quality of life.

More than half of the students were seen to have examined laboratory findings, which is one key aspect of patients' physical



Abbreviations : *AST: Aspartate aminotransferase test, ALT: Alanine aminotransferase test, GGT: Gamma glutamyl transferase test, LDL: Low-density lipoprotein test, HDL: High- density lipoprotein test, TSH: Thyroid stimulating hormone testing. others includes hemogram and serological tests and blood substance analysis tests .*

Figure 1: Examining / saving the laboratory results according to the clinical practice form by the students

health status, and to have interpreted the normal-abnormal states of their findings. Changes occur in patients' laboratory findings due to reasons such as psychopharmacological agents, sedentary lifestyle, nutritional status, and other habits. The literature has reported liver function tests to provide higher scores in individuals with alcohol and substance use disorders and lipid values to be higher in individuals with a comorbid diagnosis of a mental disorder, a diagnosis of CVD, and/or a diagnosis of MetS, as well as in individuals with a diagnosis of prediabetes or DM, all compared to the general population (30,31). Psychiatric nurses should also follow and interpret the laboratory findings of individuals with mental disorders in order to take on an active role in protecting and promoting health (2,3).

The students evaluated their patients' physical health status in line with their daily living activities. Accordingly, the students were determined to have most frequently discussed sleeping activity followed by eating activity, with sexual activity being discussed least often and most superficially. The students who comprehensively evaluated sleeping activity were determined to have planned nursing care specific to this area. Less than half the students were determined to have evaluated all questions about eating activity; however, nursing diagnoses specific to this area were addressed quite frequently. Taşdemir and Kızılkaya's (32) study examined the cases of 136 nursing students and determined 15.5% of students who'd completed their clinical practice in psychiatric services to have identified a diagnosis related to sleep activity. Ata and Çobanoğlu (33) found 97.2% of students to have collected data on sleeping and eating activities and determined this area-specific diagnosis to have occurred at a rate of 40.7%.

This study has observed students to determine their nursing diagnoses related to sexual activity, being the least evaluated activity, in a more limited manner. A similar study conducted in Türkiye determined diagnoses related to sexual activity to also occur least often with regard to the nursing care plans examined in the Mental Health and Diseases Nursing course (34). Another study determined nursing students' attitudes and beliefs toward sexual activity in Türkiye to be more negative compared to those of nurses and student nurses in other countries (35). Ata and Çobanoğlu's (33) study observed students to have problems collecting data and diagnosing with regard to patients' sexual activity and to sometimes not even evaluate this area. Students' communication skills were thought to not be at the desired level during the diagnosis of sexual activity. However, although sexuality is not considered separate or isolated from other daily life activities, evaluating it has been stated as an extremely difficult issue in Türkiye, as well as informing individuals about this (36). Through cultural effects, an insufficient number of well-trained mental health professionals who focus on the sexual health of the patients with a mental disorder has also been found, which is why this area usually stays in the background and rarely questioned (37).

Apart from daily living activities, a limited number of evaluations were determined to have occurred regarding menstrual cycles, menopause, and pap smear tests for women, regarding prostate self-examinations for men, and regarding breast self-examinations for both men and women. While health screenings fall outside daily living activities, they are also important as they affect daily life activities over time. For example, routine cancer screening is important for early diagnosis (3,38). The literature review revealed much evidence that not adequately addressing these parameters negatively affects individuals who have a mental disorder diagnosis (38). Chou et al.'s (39) stated that, although the risk of developing cancer is lower in individuals with schizophrenia compared to the general population, this is not true for breast cancer and cervical cancer. Another study conducted in Taiwan found liver cancer to be the most common type of cancer in patients diagnosed with schizophrenia, alongside Hepatitis B and Hepatitis C (40).

The current study determined both male and female students to have also limitedly evaluated the patient cases regarding routine dental and eye examinations. Ashour et al.'s (41) study stated 91% of psychiatric patients to have excessive sugar consumption, which paves the way for high rates of dental diseases. Studies have shown glaucoma and/or other retinal disorders accompanying physical diseases and the use of antidepressants to play a role in the future development of cataracts (42,43). However, Jani et al.'s (44) study found a relationship between retinopathy and psychosocial symptoms due to DM. In line with this, nurses should be emphasized to evaluate routine cancer screenings, as well as dental and eye examinations that increase individuals' quality of life, and to follow the necessary practices, apart from just evaluating patients' daily life activities.

The students in this study were observed to have determined the diagnoses of disturbed sleep pattern, self-care deficit, and imbalanced nutrition (under/over body requirements) with regard to patient physical health on their nursing care plans. The students were observed to have evaluated sleep, personal cleanliness, and dressing activities relatively more than other parameters in daily living activities and to have made appropriate nursing diagnoses. However, despite the relatively low number of evaluations regarding eating activity, the students' diagnosis of patients having imbalanced nutrition (under/over body requirements), their relatively moderate number of inquiries into mobilizing activity, and their failure to identify a nursing diagnosis in this area may indicate deficiencies in the data collection process. When examining the literature, more studies are seen to have occurred that analyzed and evaluated the nursing diagnoses as determined by students who practice in surgery and internal medicine services as opposed to psychiatric services (45-47). Nursing diagnoses determined within the scope of the Mental Health and Diseases Nursing course as conducted in universities in Türkiye were previously examined and disturbed sleep pattern (7.83%) was seen to have been the most frequently determined diagnosis (34). Meanwhile, Uysal et al. (48) identified most of the determined nursing diagnoses to have been based on accurate but insufficient objective and subjective data. The results of the

current research show that, similar to the literature, students should take objective and subjective data into consideration when making their nursing diagnosis. This situation may result in patients being given specific and patient-centered nursing care.

CONCLUSION

As a result of this study assessing students' ability to evaluate the physical health status of individuals diagnosed with mental disorders, the students were observed to be unable to fully transfer their theoretical knowledge to clinical practice and to be unable to address physical health parameters in depth. Therefore, the research findings are thought to be able to provide information on evaluating the physical health of patients diagnosed with mental disorders at the undergraduate level and to form the basis for future research with nurses who will work in the field of psychiatry.

In line with the research findings, the student nurses' evaluations of the physical health of patients with mental disorders were better in some areas such as sleep and eating while insufficient in other areas such as sexual activity, other routine cancer screenings, and routine dental and eye examinations. Deficiencies in communication skills, inability to apply theoretical knowledge to clinical practice, and an insufficient number of nurse educators per student may have led to this result. In order to provide holistic nursing care that includes individual, biological, psychological, emotional, and social aspects, having students consider all parameters in depth is important. In order to do this, studies need to be carried out on holistic care during student education (2,49). One theme that emerged in Kaya et al.'s (50) qualitative study on holistic care was students' views regarding the instructors wanting to the students to benefit from the experience of interviewing a real patient.

Dyrstad et al.'s (51) study determined the simulation used to transfer theoretical knowledge into clinical practice in real life situations to be beneficial. In line with this, the current study recommends the use of innovative teaching techniques such as case studies and clinical simulation in theoretical and laboratory course hours for evaluating the physical health of individuals diagnosed with mental disorders. In addition, observing the physical health status of patients diagnosed with mental disorders during clinical practice and conducting group sessions with developmental feedback would also be considered beneficial.

Ethics Committee Approval: This study was approved by the ethics committee of Acıbadem University (Dated September 30, 2022; Permission No. 15/22).

Informed Consent: Written consent was obtained from the participants.

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REVIEW ARTICLE
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Violence Exposure of Infertile Couples: A Systematic Review

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ABSTRACT

Objective: This study systematically evaluated the current literature on the types of violence perpetrated against infertile couples. Violence against infertile couples is quite common in societies. Literature on the types and levels of violence faced by couples is limited.
Materials and Methods: In this study, databases were scanned using 'infertilite ve şiddet','infertility and violence' keywords. Open access clinical trials that met the inclusion criteria and conducted between January 2015/March 2020 were reviewed. The databases included Scopus, Science Direct, Cochrane, the Wiley Online Library, the National Academic Network Information Center National Medical Database, Google Scholar, and Web of Science were looked at. In this systematic review, seventeen studies were chosen based on inclusion/exclusion criteria.
Results: Many of these studies (94.11%) were conducted with women. Thirteen studies examining types of violence toward infertile women found such women suffered from emotional (96.3%), verbal (84.9%), physical (68%), sexual (60%) and economic violence (77.4%). Marriage age, length of marriage, family structure, confirmation of infertility, length of infertility, number of infertility therapies received, alcohol/smoking use, education level, and employment status were described as factors influencing the incidence of violence in infertility.
Conclusion: The results of these studies indicated that infertile couples had higher rates of social pressure and domestic abuse. However, this study revealed that there is a lack of research on violence towards men in cases of infertile couples.
Keywords: Infertility violence, infertilite ve şiddet, intimate partner violence, domestic violence, nursing

INTRODUCTION

Violence is a public health issue around the world, regardless of geography, economy, or education level (1). The World Report on Violence Health (WRVH) defines violence as the intentional use of physical force or power against oneself, another person or a group or community with a high likelihood of resulting in injury, psychological harm, death or maldevelopment (2). The World Health Organization (WHO) emphasizes that there are three types of violence: self-directed violence, interpersonal violence, and social violence; categorizes violent acts as physical, sexual, psychological, deprivation or negligent (3).

Having a child or children is often an important goal for couples. Infertility causes people to experience feelings of failure, and exclusions due to personal, social, or religious reasons may cause a crisis in which women are subjected to violent behaviours (3). Particularly in developing countries, infertility is changing from being a personal problem to an unpleasant social stigma with devastating consequences related to social relationships, expectations, and needs (2).

This study systematically evaluated the current literature on the incidence types of violence against infertile couples.

METHODS

Research design

This study was planned as a systematic review to determine the extent and types of violence to which infertile couples were exposed and the associated factors. This review was conducted in accordance with the Preferred Reporting Items for Systematic Review Meta-Analysis (PRISMA) guidelines (Figure 1) (4).

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Research Questions

- What are the related factors of violence against infertile individuals?
- What are the types of violence that infertile couples experience?

Data Sources Search Strategy

This review was conducted in accordance with the Preferred Reporting Items for Systematic Review Meta-Analysis (PRISMA) guidelines (4). Using the keywords 'infertility violence' or 'violence in infertile couples' or 'violence in infertility', two researchers worked independently to scan the following databases: *Pubmed, Scopus, Science Direct, Council of Higher Education (CoHE) Thesis Center, Cochrane, Wiley Online Library, National Academic Network Information Center (ULAKBIM) National Medical Database, Google Scholar,* and *Web of Science*. Open access clinical trials that met the inclusion criteria and took place from January 2015 to March 2020 were evaluated for compatibility in terms of title and abstract keywords. The research papers included in the review were obtained from open-access electronic databases. The study included (i) research papers that were (ii) written in Turkish or English, (iii) published between January 2015 March 2020, and (iv) with open access to the full text. Exclusion criteria for the study; (i) limited access to the article (ii) the article is a systematic review, review, validity-reliability study, or gray literature.

The systematic review included a total of seventeen articles that met the inclusion criteria and qualified for the review according to the subject (Figure 1). Two researchers (EC, EB) applied the systematic review criteria to select the research conducted for the data collection. A third researcher (MK) made the final evaluation of the systematic review. Disputes were resolved unanimously.

Two researchers (EC, EB) independently completed the quality assessment of the studies included in the review using a 15-item scoring list. Quality assessment is an evaluation tool that assesses in detail the quality of the material, method, and statistical analysis of the research. Each item is scored 1 (yes) 0 (no/indeterminate) (Table 1) (5).

RESULTS

Eight of the seventeen studies included in this systematic review were conducted in Turkey with three in Iran, two in Egypt India, one in Gambia, and one in Nigeria. Many of these studies (94.11%) were conducted by applying questionnaire scales to women (Table 1). Only one study conducted in Turkey included men (6). The sample size of the studies varied between 30-8,664. The ages of the women included in the study ranged from 15 (7) to 49 (8). The scale most often used was *Infertile Women's Exposure to Violence Determination Scale (IWEVDS)* (four studies).

Table 1 presents a detailed examination of the studies included in the systematic review under the subject headings of method, objective, and main results.

Rate Effect of Violence in Infertility

Thirteen studies found the rate of exposure to domestic violence and the incidence of domestic violence among infertile women to vary from 15% to 93.4%. Contrary to the literature, a study examining the relationship between parity and intimate partner violence in Nigeria reported no relationship between infertility and intimate partner violence (8).

The studies included in the review found depression to be common in women exposed to violence and identified a significant relationship between violence and anxiety (9-13). The sexual relations of infertile couples exposed to violence were also reportedly negatively affected (6, 12, 14).

Factors Associated with Violence in Infertility

Marriage Age: Three studies reported a relationship between marriage age and domestic violence; women who married when less than 18 or 19 years of age (17) were exposed to more domestic violence (15-17).

Length of Marriage: Three of the five studies investigating the relationship between the duration of marriage and violence reported that the length of marriage was not a risk factor in terms of violence (15-17) whereas two studies associated longer duration of marriage with domestic violence in two studies (9, 18).

Family structure: Only three studies conducted in Turkey examined infertility as related to violence in the family structure (6, 19, 20) Two studies reported that the rate of exposure to violence was higher for infertile women living in extended families (19, 20). The Nigerian study (8) concluded that the likelihood of domestic violence was 46% higher in communities where most women justified intimate partner violence.

Infertility Diagnosis Process: Some of the factors affecting the incidence of violence in infertile couples; a confirmed diagnosis of infertility, lengthy duration of infertility and number of treatments received. The duration of infertility was not reported as a risk factor in three studies (16, 17, 20).

Alcohol or Smoking: Six studies investigated the relationship between alcohol consumption and /or smoking in men in relation to intimate partner violence. Three studies reported alcohol consumption (9, 11, 17) and two studies reported cigarette consumption (16, 18) to be associated with violence.

Education/Employment Status: Nine studies evaluated education/employment status. Three studies concluded that the education level of a woman correlated to the likelihood of exposure to violence (8, 11, 15). In contrast to these studies, three studies reported the rate of exposure to violence to be higher in women with low levels of education (13, 18, 19). Four studies reported a relationship between women's employment and violence (18-20) whereas one study reported no relationship (17).

Table 1: Characteristics and Quality Assessment Criteria Scores of the Included Articles

References	Measurements	Participants	Aim	Findings	Quality (Score out of 15)
Çay, H.and Şen,S.2017	Cross-sectional Researcher's questionnaire/ IWEVDS/Beck Depression Inventory (BDI)	306 women	Exposure to violence and depression of infertile women and the relationship between them	*Rate;* 69,4% *Type;* Emotional=85,8% Verbal=84,9% Physical=34,0% Sexual=30,2% Economic=77,4%	*12*
Öztürk, R.et. al,2017	Cross-sectional Researcher's questionnaire/ IWEVDS	301 women	Prevalence of violence and the effect of infertility on violence in women receiving infertility treatment.	*Rate;* 32,5% *Type;* Verbal=38,7% Physical=31,9% Emotional=21,8%	12
Alijani et.al.,2018	Cross-sectional Researcher's questionnaire/ The Revised Conflict Tactics Scale (CTS2)	379 women	Prevalence of domestic violence among infertile women and associated risk factors	*Rate;* 88,9% *Type;* Emotional=85,8% Verbal=48,3% Sexual=28,2% Physical=25,9%	11
Bondada,S. et.al.2018	Cross-sectional Hamilton Anxiety Rating Scale (Ham-A)/ Hamilton Depression Rating Scale (Ham-D)/ WHO Violence Against Women Instrument	100 women	Domestic violence and psychiatric comorbidity in infertile women	*Rate;* 50% *Type;* Emotional=34% Physical/Sexual=16%	11
Diericx,S. et.al.2018	Qualititve Semi-structured questions	33 women	Effects of infertility on women's lives and its relation to gender and cultural norms and different social positions	*Type;* Emotional/Physical	8
Halıcı,E.C. and Saatçi,E.2018	Cross-sectional Researcher's questionnaire/ CTS2/Marital Adjustment Test (MAT)	28 men	Male violence against his wife in couples applying for infertility treatment and the male's marital adjustment in these couples.	*Rate;* 93,4% *Type;* Emotional=93,4% Physical=37,4% Economic=32,2% Sexual=9%	13
Mansour,F. and Mohdy,HA.2018	Cross-sectional Researcher's questionnaire	246 women	Prevalence and types of domestic violence and the factors affecting its occurrence against infertile women	*Type;* Emotional, Sexual Physical	10

Satheesan,SC. and Satyanarayana,VA.2018	Cross-sectional Researcher's questionnaire/ Marital Quality Scale (MQS)/ Domestic Violence Questionnaire/ Depression Anxiety Stress Scale-21(DASS-21)/ Connor Davidson Resilience Scale (CD-RISC)	30 women	Quality of the marital relationship, domestic violence, psychological violence and resilience in a sample of women with primary infertility.	*Rate;* 47% *Type;* Emotional=46% Physical=16% Sexual=7%	13
Sis Çelik,A. and Kırca,N.2018	Cross-sectional IWEVDS	423 women	Prevalence and risk factors of domestic violence among women with infertility	*Rate;* 93% *Type;* Emotional=62% Physical=30% Sexual=6% Economic=19%	13
Solanke,BL. et.al.2018	Researcher's questionnaire	8664 women	Relationship between parity and domestic violence	*Rate;* 21,5%	10
Şahin,S. et.al.2018	Cross-sectional Researcher's questionnaire/ BDI	774 women	Frequency of family violence among infertile women, examining some related variables and the anxiety	*Rate;* 15% *Type;* Emotional=56,1% Physical=11% Verbal=11% Sexual=21,9%	11
Yurtçu,BG. and Saatçi,E.2018	Descriptive Researcher's questionnaire/ IWEVDS/Beck Depression Inventory For Primary Care(BDI-PC)	350 women	Relationship between the violence that the woman is exposed to and depression in couples who apply for infertility treatment	*Scores (X̄±SD.).* IWEVDS=49,53±13,66 BDI-PC=3,54±2,75	10
Akpınar,F. et.al.2019	Cross-sectional Researcher's questionnaire/ Abuse Assessment Screen(AAS)	142 women	Data on domestic violence related to infertility among women in Middle Eastern countries	*Rate;* 47,9% *Type;* Emotional=76,5% Physical=17,6% Sexual=4,4% Physical/Sexual Violence=1,5%	9
Ghaly,AS. et.al.2019	Descriptive Researcher's questionnaire	300 women	Spousal violence against infertile women	*Type;* Emotional=96,3% Physical=50,7% Sexual=45,7%	10
Kırcıl,AE. and Kılıç,M.2019	Descriptive/ correlational Researcher's questionnaire/ Infertility Distress Scale (IDS)/IWEVDS	240 women	Psychological state and exposure to violence in infertile women and the relationship between them	*Scores (X̄±SD.).* IDS=60,91±10,26 IWEVDS=85,12±15,37	12

Poornowrooz, N.et.al.2019	Cross-sectional Researcher's questionnaire/ Domestic Violence Inventory/ Female Sexual Function Index (FSFI)	147 infertile 199 fertile women	Exposure to violence and sexual function status between fertile and infertile women	*Rate;* 56.5% of infertile women 35.7% of fertile women *Type;* Emotional=52,4% Sexual=27,2% Physical=34%	12
Rahebi,SM. Et.al.2019	Case-control WHO Domestic Violence Questionnaire	200 infertile 200 fertile women	Relationship between domestic violence and factors associated with infertility	*Rate;* 83,5% *Type;* Emotional=70% Physical=68% Sexual=60%	13

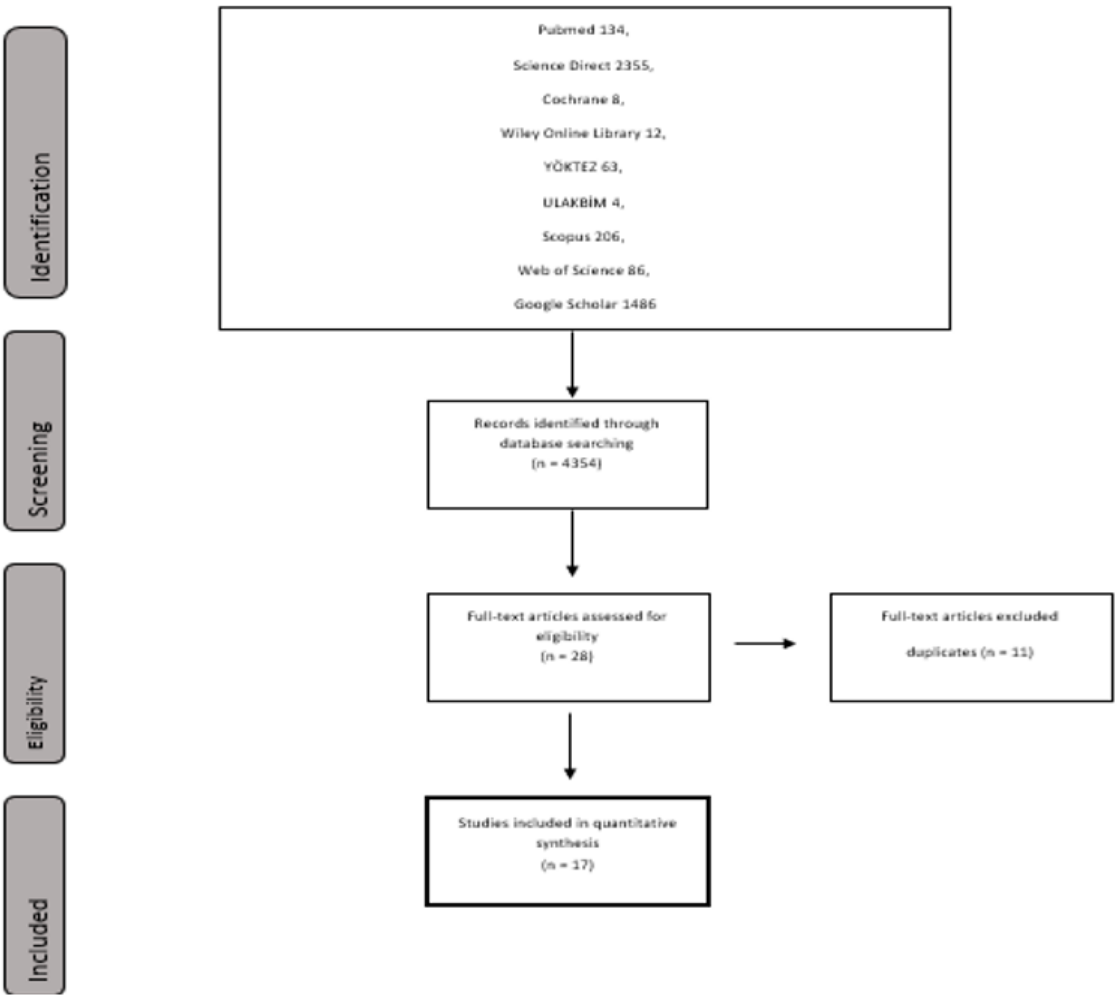

Figure 1: Flowchart of the selection procedure adapted from the Preferred Reporting Items for Systematic

Type of Violence in Infertility

Thirteen studies examining the types of violence directed toward infertile women found that infertile women were exposed to emotional, verbal, physical, sexual, and economic violence. These studies reported the incidence of emotional, verbal, physical, sexual, and economic violence to be96.3%; 84.9%; 68%;60%; 77.4% respectively.

DISCUSSION

The Rate Effect of Violence in Infertility

Violence is an intercultural and global issue and infertility can trigger a crisis that may pave the way for violence. According to WHO (2021), violence against women is the most common type of violence, usually hidden, and most often committed by intimate partners. The rate of women (between 15-49 years old) who were subjected to violence by their spouses was reported as 27% (1). Thirteen (76.47%) of the articles included in this systematic review addressed domestic violence in infertile couples whereas some investigated social violence. Solanke et. al (2018) found that infertile individuals were not exposed to violence and emphasized that this result, which was different from other studies, could be due to cultural differences between societies.

Factors Associated with Violence in Infertility

All studies, including the one study involving men, concluded that the likelihood of violence against women increased in the presence of a diagnosis of infertility. A qualitative study reported that being a mother was an important role for an adult woman, and women who were not mothers were socially stigmatized and, exposed to severe violence by society (21).

The results of the studies included in this systematic review provided the reasons for violence against women which include the cultural infrastructure of society, the social perspectives on women, the meaning attributed to women in society and the belief that fertility is a woman's self-fulfilment.

In the study by Sis Celik Kirca (2018), the vast majority (76%) of women exposed to violence stated that they did not seek help since they did not want any problems in the family, which supports the above-mentioned findings.

A 2021 report published by WHO emphasized the importance of the related factors triggering violence, particularly in individuals exposed to domestic violence. Violence is known not to depend on a single cause or factor but is associated with many factors. There may include education level, employment status of the woman or man, alcohol or substance consumption, tendency toward physical violence, communication level between partners and gender roles (1). Family structure and social structure were evaluated in four studies conducted in Turkey and Nigeria (6, 8, 19, 20). The likelihood of exposure to domestic violence was higher among women living in extended families that considered intimate partner violence to be normal (8, 19, 20). The difference between the study by Halici and the other studies in the present review may that the study by Halici studied men, and the violence experienced by women, particularly the emotional violence, may not be clearly expressed by men.

Early marriage is a common social problem in developing and undeveloped countries, particularly in societies where the traditional family structure was adopted (22). The patriarchal structure of traditional societies, the prevalence of gender inequality, and the inability of women to benefit from education due to early marriage are thought to contribute to the likelihood of women marrying at an early age to suffer from domestic violence (22). Studies that evaluated marriage duration, a confirmed diagnosis of infertility, infertility duration and number of treatments, alcohol consumption, smoking, and education level showed that women were more likely to experience violence in the presence of smoking, alcohol consumption, or in marriages of longer duration, with increased number of infertility treatments, and when education level increased in women and decreased in men. These results supported the expert opinions from the literature. The reason for the differences between the studies is attributed to the private nature of violence, the characteristics of the society in which the research was conducted, and the design of the research.

The psychosocial well-being of individuals is positively affected by employment and socioeconomic status (20). Studies that evaluated employment status concluded that employment status of the spouse or women affected the incidence of violence, such that the IWEVDS scores of working women were lower (13, 20). The likelihood of exposure to violence was also reported to decrease if the man had a job. Rahebi et.al (2019) found in their study that women whose husbands were not employed were sixteen times more likely to experience violence. It is thought that increased stress and financial and moral difficulties caused by infertility treatment are combined with employment problems and negative socioeconomic conditions, the tendency to violence increases. This, however, varies from country to country.

Type of Violence in Infertility

The results of fourteen studies (including the study with men) evaluating the types of violence showed that emotional violence was the most common type, followed by verbal violence, physical violence, sexual violence, and economic violence, though the rankings vary in different cultures and societies. One study concluded that the rate of violence against infertile women was low, and women were most often exposed to verbal violence, but physical and emotional violence were also common (3).

CONCLUSIONS

The studies included in the present systematic review showed that infertility is a factor affecting women's exposure to domestic violence. They concluded that violence was not only associated with the infertility factor but also with education level, employment status, alcohol or substance consumption, the mental state of the partner, gender inequality, and the structure of the family or society were other factors associated with increased exposure to violence. The literature review showed that in the context of infertility, only violence against women was investigated while violence against men was ignored.

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Crush Syndrome and Nursing Care Management*

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ABSTRACT

Crush syndrome is a medical condition that occurs after a crushing injury to skeletal muscle, and is characterized by major shock and kidney failure. The key clinical features of crush syndrome are crushing injury to a large mass of skeletal muscle, increased permeability of the cell membrane, and the release of potassium, enzymes, and myoglobin from within cells. The symptoms of crush syndrome include myalgia, generalized weakness, and darkened urine. To prevent the complications that may occur due to rhabdomyolysis and compartment syndrome, importance is had in ensuring the casualty maintains adequate circulatory volume and providing adequate diuresis. Nursing care is very important in planning the treatment and care to be applied to the patient and in monitoring treatment effectiveness.
Keywords: Nursing, crush syndrome, rhabdomyolysis, compartment syndrome, management

INTRODUCTION

Crush syndrome is when an environmental factor exposes the torso, extremities or other parts of the body to direct physical trauma through a crushing or compressing force (1). As a result of the deterioration of muscle tissue integrity regarding crush syndrome, myoglobin, potassium, and phosphorus are released into the bloodstream. This syndrome is typically characterized by hypovolemic shock and hyperkalemia. If left untreated, acute renal failure can also accompany this (2).

While traffic accidents, wars, avalanches, and landslides are among the causes of crush syndrome, it is also often seen to result from being trapped in a void after an earthquake (3). Crush syndrome, is one of the complications seen after an earthquake, and was first recorded in 1909 with the Messina earthquake. Fatigue, muscle swelling, and brown urine were reported to have been observed in the survivors of the earthquake, and most of these people died in the hospital (4, 5). The cause of this condition, known as crush syndrome, was first reported by nephrologist Dr. Bywaters in 1940. Bywaters followed up on patients who'd survived the London bombing of 1941 after being under the rubble for 3-4 hours and who had no injuries other than a limb impingement. In his observations of these patients, he noticed a decrease in blood pressure, a decrease in the amount of urine, and an increase in the level of blood urea to cause crush syndrome, as well as the release of some harmful substances in the oppressed muscle groups (6). In the years following Bywaters' determinations, other important developments were recorded in the fight against crush syndrome. The death rate due to crush syndrome, which had been %91 during World War II, was observed to decrease to 50% during the Vietnam War years (7, 8).

Crush syndrome is assumed will develop in approximately 2-5% of all injuries, and with acute renal failure developing in 1.5% of all injuries resulting from earthquakes (9). Türkiye is on significant fault lines and has experienced many earthquakes over the last century, in particular the 1939 Erzincan Earthquake, the 1999 Adapazarı and Düzce Earthquakes, and the very recent Kahramanmaraş Earthquake, with many lives lost in all of these. Although the crush syndrome rate has not yet been determined regarding the Kahramanmaraş Earthquake, this rate was reported as 1.4% in the 1999 İzmit Earthquake (10). The importance of nursing and multidisciplinary approaches has been understood once again due to the sequelae and psychological support needs of injured people (11).

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Pathophysiology

Rhabdomyolysis is defined as the occurrence of various pathologies in the systemic circulation as a result of the breakdown of muscle cells due to crush syndrome and involves the mixing of intracellular electrolytes, myoglobin, and other sarcoplasmic proteins into extracellular spaces. Although crush syndrome is the main cause of rhabdomyolysis, rhabdomyolysis may not always occur as a result of muscle trauma and may not lead to acute renal failure (12).

The etiology of rhabdomyolysis can be divided into two main groups non-physical and physical causes.

Non-physical causes: These include alcohol and drug use (e.g., statins), electrolyte disturbances (especially hypokalemia and hypophosphatemia), and infections.

Physical causes: These include earthquakes, traffic and mining accidents, electric shocks, excessive exercise, and muscle compression (baromyopathy) as a result of staying in certain positions for extended periods of time. Baromyopathy involves impairment of the permeability of the muscle cell membrane. While substances such as potassium, myoglobin, and creatine, which are found in large amounts in the muscle, pass into the extracellular environment, sodium, chloride, calcium, and water are filtered into the cell; thus, cell edema develops that leads to compartment syndrome (9,13).

Rhabdomyolysis has multiple causes. The main cause is direct myocyte damage or disruption of the energy supply in muscle cells. Muscle cells keep intracellular calcium levels low through the sodium-potassium adenosine triphosphatase (Na-K ATPase) pump and voltage-dependent sodium-calcium (Na-Ca) exchange channels. The Na-K ATPase pump provides active transport of intracellular sodium to the extracellular space. The gradient that occurs through the excretion of sodium into the extracellular space causes calcium to concentrate in the sarcoplasmic reticulum and mitochondria. In addition to the muscle necrosis that occurs under an overwhelming load, traumatic rhabdomyolysis may also occur, especially with reperfusion after the removal of the overwhelming load. Reperfusion causes blood, sodium, and inflammatory mediators in particular to reach the damaged tissue and form free radicals. The resulting free radicals and ATP supply-demand mismatch cause an increase in intracellular calcium levels and disruption of cellular transfer mechanisms. Meanwhile, increased calcium levels, activate proteolytic enzymes and phospholipases, disrupting muscle cell structure. Apoptosis and cell lysis occur through induced hypoxia. Due to cell destruction, enzymes and electrolytes such as potassium, myoglobin, creatinine kinase, phosphate, uric acid, lactate dehydrogenase, and aspartate transferase increase in the serum. When increased myoglobin levels exceed the plasma binding capacity, myoglobin transforms into glomerular precipitates that can cause acute kidney injury. Acute kidney injury and an accompanying electrolyte imbalance occur due to traumatic rhabdomyolysis (13, 14).

Another important consequence of crush syndrome is compartment syndrome, which is an acute condition that may require surgical intervention, and result in increased pressure in the area surrounded by facial membranes and the disruption of tissue function in that space (15, 16). Acute compartment syndrome (ACS), is the general name of the group of major traumas that include increased pressure in the muscle compartment of the relevant extremity, impaired extremity vascularization, and long bone fractures. In addition to major trauma, ACS can occur following minor trauma or non-traumatic causes and is usually seen on the forearm, gluteal region, thigh, and foot. The common symptom seen in all cases is cellular anoxia (15).

Clinical signs

In patients with crush syndrome, clinical findings mainly occur in the form of traumatic rhabdomyolysis with localized symptoms occuring in the oppressed muscle, as well as systemic findings due to substances released from these muscles.

The increase in the number of enzymes such as myoglobin, potassium, magnesium, phosphate, acids, creatine phosphokinase (CPK), and lactate dehydrogenase (LDH) leaking into the circulation as a result of crushing has a toxic effect on the body. Traumatic asphyxia, hypovolemia, crush injury to the extremities, and organ injury may occur in adults with a severe crush injury. In addition, acute kidney injury and acute respiratory distress syndrome can be seen as the sequelae of crush injury.

Traumatic asphyxia: This is seen to occur due to severe crushing of the chest. An increase in thoracic pressure and pressure in the superior vena cava can cause ruptures in the head and neck capillaries. Cervicofacial cyanosis, edema, subconjunctival hemorrhage, and petechial eruptions on the face, neck, and trunk may also occur.

Hypovolemia: Hypovolemic shock may occur, usually within the first few hours after a crush injury. This can occur as a result of a damaged blood vessel from an injured extremity or as a result of occult bleeding due to an organ injury. Understanding and treating the cause of hypovolemic shock is very important for preventing the development of acute kidney injury.

Crush injury to the extremities: Crush injury to the extremities may present clinically in a spectrum ranging from diffuse swelling and erythema to blisters and purpura, open fractures, and ischemia. In addition to the management of the anticipated orthopedic and vascular problems associated with such injuries, awareness of the potential these patients have for developing acute compartment syndrome and rhabdomyolysis should be considered. Compartment syndrome has typical findings that can be summarized as 6P (i.e., pain, pressure, paresthesia, pulselessness, paresis, and pallor). Prolonged compression can lead to cell death, leading to muscle necrosis and rhabdomyolysis.

Organ injury: Blunt injury to the thorax or abdomen may cause injuries such as pulmonary contusion, cardiac contusion, rib fractures, pelvic fracture, hemothorax, and pneumothorax.

Acute kidney injury: In addition to the direct nephrotoxic effects of the breakdown products resulting from crush syndrome, acute kidney injury may also occur as a result of myoglobin and urate crystals contributing to acute tunnel necrosis or from and due to hypotension and hypoperfusion. Crush-related acute kidney injury manifests as rhabdomyolysis and myoglobulinemia, hyperkalemia, hyperphosphatemia, and myoglobinuria. Elderly individuals and those with chronic kidney disease are at increased risk for progression to end-stage kidney disease. Even under optimal conditions, the risk of dialysis is about 10%. Indicators of the need for dialysis are shown in Table 1 (14, 17, 18).

Acute respiratory distress syndrome. Acute respiratory distress syndrome can also occur following a severe crush injury. Large-volume crystalloid resuscitation may be associated with an inflammatory response to injury, tissue necrosis, or fat embolism syndrome associated with long bone fractures.

Managing Crush Syndrome

Medical care of the injured is handled in three stages: removal from the wreckage, removal from the wreckage (on-site intervention), and post-removal from the wreckage (intervention in a health facility). In addition, three main methods are applied to prevent or minimize the severity of acute kidney injury: intravenous (IV) fluid hydration, alkalization, and forced diuresis under special conditions. In the treatment of crush syndrome, administering IV sodium bicarbonate (NaHCO3), increasing the urine pH above 6.5, and preventing renal toxicity are among the main goals (19).

On-site management

The ABCDEs of first aid

Severe respiratory failure may occur once the injured has been exposed to blunt chest trauma. In this case, they may need oxygen, airway patency, and the use of a ventilator. Circulatory collapse and hypovolemia may also be seen in injured who've been unable to be removed from the wreckage for a long time (20).

First aid for the injured involves the following steps:

A (Airway): Airway patency should be checked, and the cervical spine should be protected by wearing a collar.

B (Respiratory): Breathing should be checked, and the casualty should be kept away from dust by having them wear a dust mask. Safe intubation can be difficult in the field and oxygen may not be given for safety reasons. Administering analgesia to injured persons with vertebral fractures may facilitate breathing.

C (Circulation): Circulation should be checked, and the bleeding should be brought under control if present; vascular access should also be opened immediately. The casualty should be hydrated. Liquids containing potassium should be avoided.

D (Defect): Stabilization of the spine should be ensured, and a brief neurological evaluation should be made.

E (Full Body Examination): Injuries may be overlooked when examining a clothed victim. If one is to save the wounded's life, they should be stripped down. In order to prevent hypothermia, the casualty should be redressed and covered after the examination.

Triage and transport

Triage in the field usually consists of three categories, giving priority to individualized care and transport.

• The first category involves –urgent- casualties. Injuries in this category are treated and transferred to a health institution before others.

• The second category involves –delayed- casualties.

• The third category involves –minor- injuries. The casualties in this category are those who can be discharged with on-scene treatment and are the last to be transported (21).

In order to reduce death rates, injured are triaged with color codes according to the severity of the injury and their medical condition (Figure 1).

Triage is repeated at hourly intervals and the injured are referred to the appropriate triage area as their clinical status changes (16).

Vascular access should be established from an appropriate extremity as an emergency response while the injured is under debris. If a vein is not found and the casualty can tolerate it, oral fluid intake should be provided. After establishing the appropriate vascular access, an infusion rate of 0.9% NaCl (saline) should be started at a rate of 1000 cc/h in adults and 10 cc/kg in the elderly until 2 cc/kg/h of urine is produced. If more than 2 hours is required to remove the injured from the wreckage, the infusion rate should be reduced to 500 cc/h (1, 14).

When the injured is removed from the debris, a 1000 cc/h infusion of 0.9% NaCl should be continued. The casualty should be observed for 6 hours from the start of the infusion. If anuria is observed and the casualty is normovolemic, infusion (at 500-1000 cc/day plus insensible losses) should be continued and dialysis should be prepared. If the casualty has sufficient urine output and close observation is possible, the infusion should be continued (at ≥6000 cc/day,) and dialysis should be prepared (1). However, if a close observation environment is not possible, the infusion rate should be continued at 3000-6000 cc/day and the casualty should be made ready for dialysis (Figure 2) (14).

Table 1: Indications of the Need for Dialysis

1. Rapid elevation of serum potassium of 6.5 mmol/L or more or unresponsive to other measures

2. Metabolic acidosis: blood pH ≤7.1

3. BUN level ≥100 mg/dL (30 mmol/L) or serum creatinine ≥8 mg/dL (700 mmol/L)

4. Uremic syndromes such as hypervolemia, pericarditis, bleeding, or other unexplained disturbances of consciousness

Figure 1. Triage colors.

Hospital management

The first aid given in the field should be transferred to the health institution where the injured is sent. Extra trauma to the casualty should be avoided by following the trauma management procedure during the referral. Until the casualty is stabilized, several clinical examinations should be performed and laboratory findings (e.g., sodium, potassium, calcium, phosphate, bicarbonate, creatinine and lactate, and/or arterial blood gases) should be checked (22).

In cases where serum electrolyte measurement is impossible, solutions containing potassium should not be administered under any circumstances. Due to the risk of hyperkalemia, the injured should be taken to cardiac monitoring, and the necessary analgesia should be provided. If hyperkalemia has developed in the injured, NaHCO3 can be given between 50-100 mEq/L, or 2.5 mg of albuterol can be administered in 3 ccs as another option (19).

When considering nephrotoxicity, antibiotic treatment should be started to provide optimum benefit and the urine output of the casualty should be checked at frequent intervals. If the injured is able to urinate, he should be asked to urinate first (1,23). If the casualty is unconscious, the Foley catheter should be inserted as quickly as possible. For urine alkalization, the urine pH is recommended to be kept above 6.5 with an IV of 50 mmol NaHCO3. Target urine output should exceed greater than 50 cc/hour for adults. After urine output has been established, 20% Mannitol at a dose of 1-2 g/kg for the first four hours should be given to maintain a urine output of at least 8 liters per day (300 ml per hour). The maximum dose of mannitol is 2 grams per kilogram in 24 hours and should not be used if the patient has severe heart or kidney failure (19).

For a casualty who is unable to urinate, the symptoms of hypovolemia (e.g., low blood pressure, filiform pulse, cold sweating) should be evaluated first. If these findings are present, hypovolemia should be treated, and if the patient is unable to urinate, IV fluids should be started (9). Intervention should be made to the relevant extremity of at wound with a suspected fracture (23).

In patients who develop compartment syndrome as a result of crush syndrome, an indication of fasciotomy may arise (24).

Irreversible nerve damage may occur after the fourth hour, and irreversible muscle damage may occur after the sixth hour. Another important point is tetanus toxoid. The administration of the tetanus vaccine to injured people should never be skipped (25).

Nursing approach

The nursing approach to the injured in the field and in the hospital is very important in crush syndrome. Nurses should deal with the injured individual and their family holistically and should provide appropriate nursing care from the first encounter to prevent the severity of crushing and death, accelerate the healing process and prevent complications.

Nursing approach to the injured in the field

• During the first intervention, the nurse should inform the conscious casualty about all the attempts that are to be made.

• The casualty's personal information should be recorded. Vital signs should be closely monitored.

• The casualty should be kept at a suitable temperature and in a suitable environment, and protected from the cold. Tight-fitting clothing should be avoided.

• The injured's state of consciousness should be closely monitored. Necessary permissions should be obtained from the relatives of an unconscious injured person.

• In order to prevent acute kidney failure that may develop on the basis of hypovolemic shock, crush syndrome, and rhabdomyolysis, 1000 cc of 0.9% NaCl solution IV per hour should be started upon the accessible free extremity of the casualty.

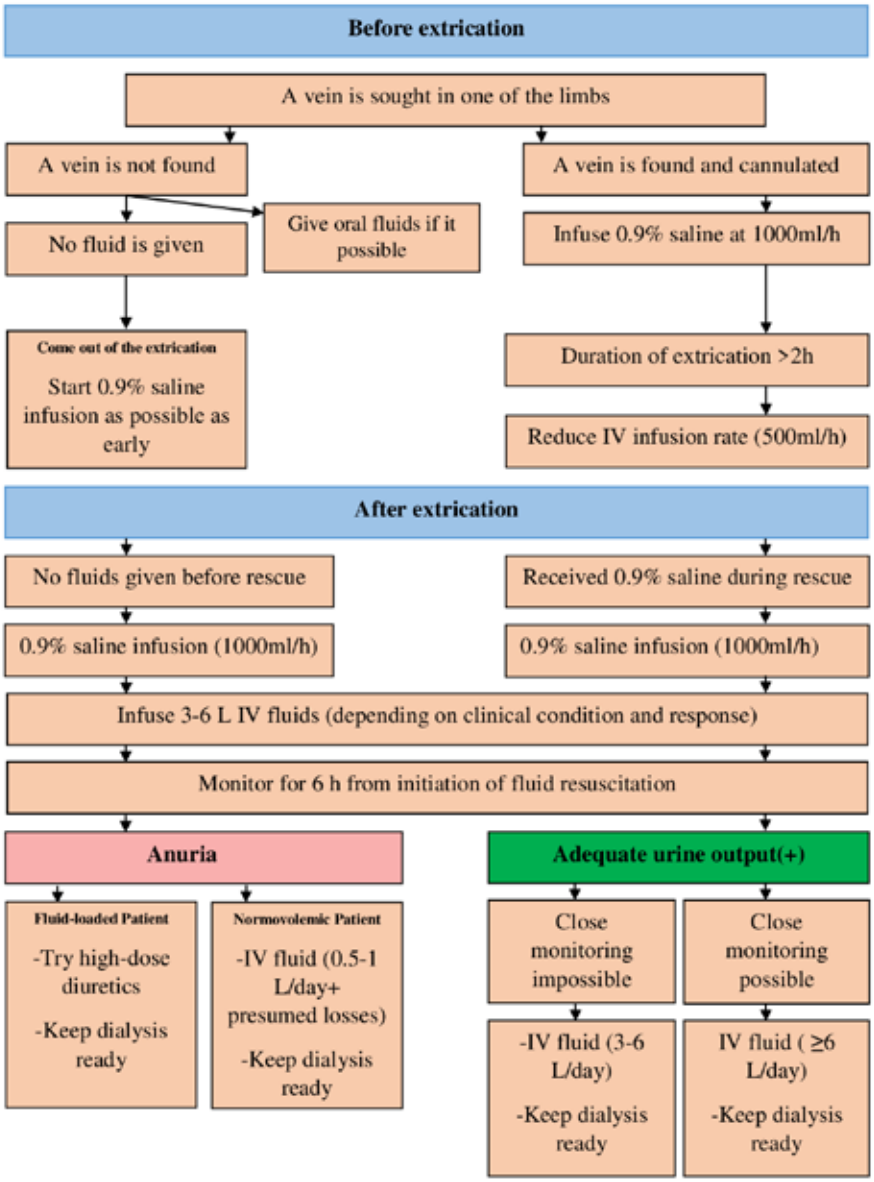

Figure 2. Algorithm for fluid resuscitation in crush injuries for mass disasters pre- and pos-extrication.

• Checking the extremities (e.g., skin color, temperature) at frequent intervals is important. The position of an extremity with an oppressed muscle should be such that it does not obstruct blood flow. In addition, position changes should be made at certain intervals, and active-passive exercises should be applied in a way that does not overexert the injured.

Nursing approach to the injured in the hospital

• Vital signs and laboratory findings (e.g., creatinine, BUN, hematocrit, serum myoglobin, sodium, potassium, SGOT, and SGPT) should be closely monitored.

• Monitoring the edema of the injured, performing skin care regularly, and keeping the skin moist is important.

• Care should be taken against the signs and symptoms of metabolic acidosis (i.e., apathy, disorientation, weakness).

• Culture samples (e.g., catheter tip, urine, blood) should be taken at regular intervals.

• ECG of the casualty, fluid intake and output, urine amount, color, and pH should be monitored and alkalization of urine pH should be ensured.

• Bleeding signs and symptoms should be monitored (e.g., petechiae, ecchymosis, hypotension, tachycardia, hematuria) and abnormal conditions should be reported to a physician.

• A diet low in protein and high in carbohydrates should be applied and foods containing phosphorus should be restricted (dairy and dairy byproducts, chocolate, meat and meat byproducts, legumes, and fruit).

• Oral care should be done at frequent intervals for the casualty's optimum comfort and nutrition.

• Maintenance of urinary catheter (every 72 hours), central venous pressure (every 72 hours), peripheral venous catheters (every 48-72 hours), and arterial catheter (every 96 hours) should be done regularly.

• The injured should be followed up frequently in terms of the risk of infection due to invasive procedures, catheters, and open wounds (e.g., redness, swelling, discharge, bad smells, fever at the catheter site, leukocytosis, and burning sensation during urination).

• In case of infection, antibiotic treatment should be started in line with the physician's request.

• If the casualty is fit for activity, their activities should be increased gradually, and a routine with rest periods should be established, early ambulation should be encouraged.

• Monitoring the nephrotoxic effects of the drugs on an injured who has undergone an intensive treatment program is also important (9, 17, 26).

CONCLUSION

Crush syndrome is an important health problem for both injured and healthcare professionals. In the management of crush syndrome, first aid and intervention in the field, as well as intervention in a health institution, should be handled with a multidisciplinary approach. Close monitoring of the casualty is required during removal from the wreckage, at the time of contact in the field, and from the emergency room to the intensive care environment. In order to prevent complications that may occur due to rhabdomyolysis and compartment syndrome, which are seen to result of from crush syndrome, maintaining an adequate circulatory volume and providing adequate diuresis are important. The nurses who, are an important part of the multidisciplinary team and the health professionals who are with the patient 24/7 should be knowledgeable about crush syndrome and its management and should be able to use this knowledge and experience in its proper place and time.

Ethics Committee Approval: Ethics committee approval is not required for this review.

Informed Consent: Informed consent is not required for this review

Peer Review: Externally peer-reviewed.

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Manuscript Types

Research Articles: This is the most important type of article since it provides new information based on original research. The main text of original articles should be structured with Introduction, Material and Method, Results, Discussion, and Conclusion subheadings. Please check Table 1 for the limitations for Original Articles.

Statistical analysis to support conclusions is usually necessary. Statistical analyses must be conducted in accordance with international statistical reporting standards (Altman DG, Gore SM, Gardner MJ, Pocock SJ. Statistical guidelines for contributors to medical journals. Br Med J 1983: 7; 1489-93). Information on statistical analyses should be provided with a separate subheading under the Materials and Methods section and the statistical software that was used during the process must be specified.

Units should be prepared in accordance with the International System of Units (SI).

Editorial Comments: Editorial comments aim to provide a brief critical commentary by reviewers with expertise or with high reputation in the topic of the research article published in the journal. Authors are selected and invited by the journal to provide such comments. Abstract, Keywords, and Tables, Figures, Images, and other media are not included.

Review: Reviews prepared by authors who have extensive knowledge on a particular field and whose scientific background has been translated into a high volume of publications with a high citation potential are welcomed. These authors may even be invited by the journal. Reviews should describe, discuss, and evaluate the current level of knowledge of a topic in clinical practice and should guide future studies. The main text should contain Introduction, Clinical and Research Consequences, and Conclusion sections. Please check Table 1 for the limitations for Review Articles.

Case Reports: There is limited space for case reports in the journal and reports on rare cases or conditions that constitute challenges in diagnosis and treatment, those offering new therapies or revealing knowledge not included in the literature, and interesting and educative case reports are accepted for publication. The text should include Introduction, Case Presentation, Discussion, and Conclusion subheadings. Please check Table 1 for the limitations for Case Reports.

Letters to the Editor: This type of manuscript discusses important parts, overlooked aspects, or lacking parts of a previously published article. Articles on subjects within the scope of the journal that might attract the readers' attention, particularly educative cases, may also be submitted in the form of a "Letter to the Editor." Readers can also present their comments on the published manuscripts in the form of a "Letter to the Editor." Abstract, Keywords, and Tables, Figures, Images, and other media should not be included. The text should be unstructured. The manuscript that is being commented on must be properly cited within this manuscript.

Table 1. Limitations for each manuscript type

Type of manuscript	Word limit	Abstract word limit	Reference limit	Table limit	Figure limit
Research Article	4000	250 (Structured)	35	6	5 or total of 10 images
Review	5000	250	50	6	10 or total of 15 images
Case Report	1000	200	15	No tables	4 or total of 8 images
Letter to the Editor	400	No abstract	5	No tables	No media

Tables

Tables should be included in the main document, presented after the reference list, and they should be numbered consecutively in the order they are referred to within the main text. A descriptive title must be placed above the tables. Abbreviations used in the tables should be defined below the tables by footnotes (even if they are defined within the main text). Tables should be created using the "insert table" command of the word processing software and they should be arranged clearly to provide easy reading. Data presented in the tables should not be a repetition of the data presented within the main text but should be supporting the main text.

Figures and Figure Legends

Figures, graphics, and photographs should be submitted as separate files (in TIFF or JPEG format) through the submission system. The files should not be embedded in a Word document or the main document. When there are figure subunits, the subunits should not be merged to form a single image. Each subunit should be submitted separately through the submission system. Images should not be labeled (a, b, c, etc.) to indicate figure subunits. Thick and thin arrows, arrowheads, stars, asterisks, and

similar marks can be used on the images to support figure legends. Like the rest of the submission, the figures too should be blind. Any information within the images that may indicate an individual or institution should be blinded. The minimum resolution of each submitted figure should be 300 DPI. To prevent delays in the evaluation process, all submitted figures should be clear in resolution and large in size (minimum dimensions: 100 × 100 mm). Figure legends should be listed at the end of the main document.

All acronyms and abbreviations used in the manuscript should be defined at first use, both in the abstract and in the main text. The abbreviation should be provided in parentheses following the definition.

When a drug, product, hardware, or software program is mentioned within the main text, product information, including the name of the product, the producer of the product, and city and the country of the company (including the state if in USA), should be provided in parentheses in the following format: "Discovery St PET/CT scanner (General Electric, Milwaukee, WI, USA)"

All references, tables, and figures should be referred to within the main text, and they should be numbered consecutively in the order they are referred to within the main text.

Revisions

When submitting a revised version of a paper, the author must submit a detailed "Response to the reviewers" that states point by point how each issue raised by the reviewers has been covered and where it can be found (each reviewer's comment, followed by the author's reply and line numbers where the changes have been made) as well as an annotated copy of the main document.

Accepted manuscripts are copy-edited for grammar, punctuation, and format. Once the publication process of a manuscript is completed, it is published online on the journal's webpage as an ahead-of-print publication before it is included in its scheduled issue. A PDF proof of the accepted manuscript is sent to the corresponding author and their publication approval is requested within 2 days of their receipt of the proof.

References

The journal uses the NLM reference system. While citing publications, preference should be given to the latest, most up-to-date publications. If an ahead-of-print publication is cited, the DOI number should be provided. Authors are responsible for the accuracy of references. Journal titles should be abbreviated in accordance with the journal abbreviations in Index Medicus/ MEDLINE/PubMed. When there are six or fewer authors, all authors should be listed. If there are seven or more authors, the first six authors should be listed followed by "et al." In the main text of the manuscript, references should be cited using Arabic numbers in parentheses. The reference styles for different types of publications are presented in the following examples.

Journal Article: Blasco V, Colavolpe JC, Antonini F, Zieleskiewicz L, Nafati C, Albanèse J, et al. Long-termoutcome in kidneyrecipientsfromdonorstreatedwithhydroxyethylstarch 130/0.4 andhydroxyethylstarch 200/0.6. Br J Anaesth 2015;115(5):797-8.

Book Section: Suh KN, Keystone JS. Malaria and babesiosis. Gorbach SL, Barlett JG, Blacklow NR, editors. Infectious Diseases. Philadelphia: Lippincott Williams; 2004.p.2290-308.

Books with a Single Author: Sweetman SC. Martindale the Complete Drug Reference. 34th ed. London: Pharmaceutical Press; 2005.

Editor(s) as Author: Huizing EH, de Groot JAM, editors. Functional reconstructive nasal surgery. Stuttgart-New York: Thieme; 2003.

Conference Proceedings: Bengisson S. Sothemin BG. Enforcement of data protection, privacy and security in medical informatics. In: Lun KC, Degoulet P, Piemme TE, Rienhoff O, editors. MEDINFO 92. Proceedings of the 7th World Congress on Medical Informatics; 1992 Sept 6-10; Geneva, Switzerland. Amsterdam: North-Holland; 1992. pp.1561-5.

Scientific or Technical Report: Cusick M, Chew EY, Hoogwerf B, Agrón E, Wu L, Lindley A, et al. Early Treatment Diabetic Retinopathy Study Research Group. Risk factors for renal replacement therapy in the Early Treatment Diabetic Retinopathy Study (ETDRS), Early Treatment Diabetic Retinopathy Study KidneyInt: 2004. Report No: 26.

Thesis: Yılmaz B. Ankara Üniversitesindeki Öğrencilerin Beslenme Durumları, Fiziksel Aktivitelerive Beden Kitle İndeksleri Kan Lipidleri Arasındaki Ilişkiler. H.Ü. SağlıkBilimleriEnstitüsü, DoktoraTezi. 2007.

Manuscripts Accepted for Publication, Not Published Yet: Slots J. The microflora of black stain on human primary teeth. Scand J Dent Res. 1974.

Epub Ahead of Print Articles: Cai L, Yeh BM, Westphalen AC, Roberts JP, Wang ZJ. Adult living donor liver imaging. DiagnIntervRadiol. 2016 Feb 24. doi: 10.5152/dir.2016.15323. [Epub ahead of print].

Manuscripts Published in Electronic Format: Morse SS. Factors in the emergence of infectious diseases. Emerg Infect Dis (serial online) 1995 Jan-Mar (cited 1996 June 5): 1(1): (24 screens). Available from: URL: http://www.cdc.gov/ncidodlElD/cid.htm.

SUBMISSION CHECKLIST

Please make sure you have the followings available:

- Acknowledgement of the study "in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration in the materials and methods section.
- Statement that informed consent was obtained after the procedure(s) had been fully explained in the materials and methods section. Indicating whether the institutional and national guide for the care and use of laboratory animals was followed as in "Guide for the Care and Use of Laboratory Animals".
- Title Page
- Copyright Agreement Form
- Author Form
- Main Manuscript Document
  - Important: Please avoid mentioning the the author (s) names in the manuscript.
  - The title of the manuscript.
  - Abstract (250 words). (Case report's abstract limit is 200 words)
  - Keywords: 3-6 words
  - Main article sections
  - References
  - All tables
  - The title, description or footnotes of all illustrations (figures)

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