Acta Medica Ruha publishes scientific/original research and review articles. It is published electronically fours a year.

It is an international scientific refereed journal that publishes articles written in English and Turkish, and includes acedemicians from different countries in its boards. Uses "Double-Blind Peer Review" in reviewing processes. It has adopted the open access principle. No fee is requested from the authors for open access, processing, publication fee or otherwise. It is totally FREE.

The responsibility of the articles published in this journal in terms of science and language belongs to the authors.

The articles published in the journal cannot be used without reference.

EDITORIAL TEAM

CONTENTS

Letters to Editor

Trends and Determinants of Alcohol Consumption in Turkey

 Okan İmre[1]

[1]Department of Psychiatry, Karamanoglu Mehmetbey University Faculty of Medicine, Karaman, Turkey

ABSTRACT

Introduction: This study explores the trends and underlying factors influencing alcohol consumption in Turkey, using data from the Turkish Health Survey (TÜİK) for the years 2010 and 2022.

Objective: The analysis focuses on the distribution of alcohol use by gender, age group, and the reasons behind the initiation of alcohol consumption.

Method: Data for this study were sourced from the Turkish Health Survey (TÜİK), which provides detailed statistics on alcohol consumption behavior among individuals aged 15 and above. The survey includes information on the prevalence of alcohol use, categorized by sex and age group, as well as the reasons individuals report for starting alcohol use.The analysis focuses on two main time periods: 2010 and 2022, to examine the trends and changes over the last decade.

Results: Findings indicate a slight decline in overall alcohol use between 2010 and 2022, with notable differences by gender and age. Furthermore, various socio-cultural factors, including peer influence, curiosity, and the desire for fun, are highlighted as significant drivers of alcohol consumption.

Conclusion: While alcohol use has slightly decreased over the last decade, gender and age disparities persist. The shift in reasons for starting to use alcohol from curiosity and peer influence to entertainment points to changing social dynamic. Policymakers and public health professionals must continue to monitor these trends to develop effective strategies aimed at reducing harmful alcohol consumption across various demographic groups.

Keyswords: Alcohol, Addiction, Dependence.

INTRODUCTION

Alcohol has many harmful effects on the individual, and family. Alcohol consumption is a widespread behavior with profound implications for both public health and social Dynamics (1). As the duration and amount of use increases, use disorder occurs. Alcohol use disorders are among the most common mental disorders worldwide. (2). It is directly or indirectly related to many chronic diseases(3,4,5).It is one of the important causes of disability and loss of employment(6). Alcohol use increases the risk of developing psychiatric disorders and also increases the tendency towards violence and crime(7).Despite its many negative biopsychological consequences, alcohol use disorders remain one of the most undertreated mental disorders. Although many studies have been conducted on alcohol use disorder, there are not enough studies on age, gender and reason for drinking(8). Alcohol use can turn into alcohol use disorder over time. Understanding the patterns of alcohol use, especially in relation to demographic factors such as gender and age, is crucial for designing effective health interventions. In Turkey, the dynamics of alcohol consumption have likely been influenced by changing social norms, economic conditions, and health awareness. This paper presents a comparative analysis of alcohol consumption in Turkey between the years 2010 and 2022, based on data from the Turkish Health Survey (TÜİK). The study examines the distribution of alcohol use by sex and age group, as well as the reasons behind the initiation of alcohol use. By analyzing these variables, we aim to identify shifts in alcohol consumption patterns and highlight potential areas for targeted public health interventions.

METHODS

Data for this study were sourced from the Turkish Health Survey (TÜİK), which provides detailed statistics on alcohol consumption behavior among individuals aged 15 and above(9). The survey

includes information on the prevalence of alcohol use, categorized by sex and age group, as well as the reasons individuals report for starting alcohol use.

The primary variables analyzed in this study include:

1. Alcohol consumption prevalence: The proportion of individuals who consumed alcohol in 2010 and 2022, broken down by gender and age group.

2. Reasons for alcohol initiation: The distribution of reasons behind alcohol consumption initiation, including curiosity, peer influence, family issues, personal problems, and for fun, as reported in 2010 and 2022.

The analysis focuses on two main time periods: 2010 and 2022, to examine the trends and changes over the last decade.

RESULTS

Alcohol Consumption Prevalence (2010-2022)

1. Overall Alcohol Consumption: In 2010, 12.6% of the total population aged 15 and above reported using alcohol, while this figure slightly declined to 12.1% in 2022. A closer look at the data reveals gender differences, with alcohol use being significantly higher among males than females. In 2010, 21.1% of males consumed alcohol compared to only 4.4% of females. By 2022, this gap remained, with 18.4% of males and 5.9% of females reporting alcohol use.

2. Age Group Differences: The highest prevalence of alcohol use was observed in the 25-34 age group in both years, with a slight increase from 17.0% in 2010 to 17.5% in 2022. Among males, the 25-34 age group had the highest alcohol consumption, but the gap between genders was notable across all age categories. For instance, the proportion of alcohol consumers in the 35-44 age group dropped slightly from 15.6% in 2010 to 15.2% in 2022 for males, while female consumption in this group increased modestly from 5.7% to 7.2%.

3. Decline in Younger Populations: A notable decline in alcohol consumption was observed in younger age groups (15-24) between 2010 and 2022. In 2010, 8.6% of individuals aged 15-24 consumed alcohol, but this figure decreased slightly to 8.3% in 2022. While male consumption in this age group decreased from 14.7% to 11.6%, female consumption increased from 2.8% to 4.9%.

4. Older Age Groups: Alcohol consumption in older age groups (55+), though lower than in younger age groups, showed minimal changes over the 12-year period. However, in the 75+ age group, alcohol consumption remained steady at around 3.3% in 2010 and 3.6% in 2022, with the male population showing a higher prevalence compared to females.

Reasons for Starting Alcohol Consumption (2010-2022)

1. Decreasing Interest in Alcohol: The percentage of individuals reporting that they began drinking alcohol out of curiosity decreased from 30.6% in 2010 to 11.3% in 2022. Males continued to report curiosity as a common reason, but the decline was more prominent among females, falling from 30.2% in 2010 to 9.6% in 2022.

2. Peer Influence and Fun: The influence of friends and the desire for fun remained significant reasons for alcohol consumption initiation. The proportion of individuals who began drinking due to peer influence decreased from 22.9% in 2010 to 13.3% in 2022. Notably, fun was a stronger motivating factor for females, with 62.1% of females in 2022 reporting it as a reason for alcohol initiation, compared to 50.4% of males.

3. Personal and Family Problems: The proportion of individuals citing personal or family problems as reasons for alcohol initiation remained relatively low and unchanged. Family issues remained a reason for 1.2% of individuals in 2010 and 1.1% in 2022, with no significant difference between genders.

4. Desire to Fit In (Admıratıon): The percentage of individuals who began drinking alcohol due to social pressures, such as a desire to fit in, decreased from 12% in 2010 to 6.7% in 2022. This decrease was more pronounced among females (from 6.2% to 2.9%) than among males (from 13.4% to 8%).

Table1. The percentage of individuals' status of alcohol use by Ggender and age group, 2010-2022 [15+ age] (%)

	2010			2022		
	Total	Male	Female	Total	Male	Female
Consumers	**12,6**	**21,1**	**4,4**	**12,1**	**18,4**	**5,9**
15-24	**8,6**	14,7	2,8	**8,3**	11,6	4,9
25-34	**17,0**	26,4	7,5	**17,5**	24,2	10,8
35-44	**15,6**	25,5	5,7	**15,2**	23,1	7,2
45-54	**13,7**	23,6	3,8	**12,2**	19,2	5,1
55-64	**11,6**	20,9	2,8	**11,0**	18,6	3,6
65-74	**5,0**	9,8	1,5	**6,7**	12,2	1,8
75+	**3,3**	6,5	0,8	**3,6**	7,1	1,2
Doesn't consume	**12,5**	**20,0**	**5,2**	**4,6**	**7,5**	**1,7**
15-24	**7,5**	10,4	4,7	**1,6**	2,3	0,9
25-34	**11,2**	15,4	7,1	**3,9**	5,2	2,5
35-44	**14,0**	22,2	5,7	**4,2**	6,4	1,9
45-54	**14,8**	24,1	5,4	**4,9**	7,5	2,3
55-64	**17,6**	32,5	3,5	**7,0**	12,5	1,6
65-74	**14,4**	30,0	2,9	**8,1**	15,8	1,3
75+	**16,0**	32,1	2,6	**7,0**	16,2	0,9
Never consume	**74,9**	**58,8**	**90,3**	**83,3**	**74,1**	**92,4**
15-24	**83,9**	75,0	92,5	**90,0**	86,1	94,2
25-34	**71,8**	58,2	85,4	**78,6**	70,5	86,8
35-44	**70,3**	52,3	88,5	**80,7**	70,5	90,9
45-54	**71,5**	52,3	90,7	**82,9**	73,3	92,6
55-64	**70,7**	46,6	93,7	**82,0**	68,9	94,8
65-74	**80,5**	60,2	95,6	**85,2**	72,0	96,8
75+	**80,7**	61,4	96,7	**89,5**	76,7	97,9

Table 2. The distribution of reasons behind starting alcohol use of individuals by gender, 2010-2022 [15+ age] (%)

	2010			2022		
	Total	Male	Female	Total	Male	Female
Interest	**30,6**	30,6	30,2	**11,3**	11,8	9,6
Admıratıon	**12,0**	13,4	6,2	**6,7**	8,0	2,9
Family problems	**1,2**	1,1	1,6	**1,1**	1,3	0,4
Personal problems	**1,9**	2,1	1,1	**3,1**	3,7	1,4
Impact of friend	**22,9**	25,9	10,5	**13,3**	14,9	8,5
For fun	**26,4**	22,9	40,5	**53,3**	50,4	62,1
No special reason	**1,6**	1,3	3,1	**11,2**	10,0	15,0

DISCUSSION

The findings of this study reveal a general decline in alcohol consumption among the Turkish population from 2010 to 2022, particularly among males. However, significant gender differences remain, with men consuming alcohol at much higher rates than women. In Turkey, there is a decrease in alcohol consumption in men and an increase in women compared to previous years. In a large-scale epidemiological study conducted in the USA, it was reported that the prevalence of alcohol use increased in women compared to previous years, while it remained stable in men(10). As a result, there is a narrowing between the genders in both countries. The fact that alcohol consumption is higher in men is consistent with the literatüre (11,12). The increase in women can be attributed to recreational use brought about by freedom. The increase in "fun" as a reason for consumption, particularly among females, reflects a more modern approach to alcohol use, possibly associated with changing social norms. On the contrary, some studies in the literature have reported that the increase in alcohol use in women may be related to past trauma (13). Studies have shown that very few individuals with alcohol use disorders seek treatment(14). Therefore, it is important to identify individuals who are at risk. Additionally, many studies have reported that most policies regarding alcohol use disorders are geared

toward men and women are neglected (15) Considering the increase in alcohol consumption among women in recent years, it can be concluded that policies targeting women should be developed. Studies have shown that social support for women is more effective in treating alcohol use disorder (16,17). Therefore, it is important to know how society's alcohol use varies between genders in order to apply different treatment protocols for gender.

The decline in alcohol use among younger individuals could be attributed to increased awareness of the health risks associated with alcohol and a growing trend toward healthier lifestyles..On the other hand, alcohol use among older individuals remained relatively stable, which may reflect generational attitudes toward alcohol.

When looking at the reasons for starting to use alcohol, there is a significant decrease in starting to use alcohol due to curiosity and peer influence and an increase in recreational use. There is also a slight increase in alcohol use due to personal problems. This situation reflects the change in social dynamics.

CONCLUSION

This study provides valuable insights into the patterns and reasons behind alcohol consumption in Turkey. While alcohol use has slightly decreased over the last decade, gender and age disparities persist. The shift in reasons for starting to use alcohol from curiosity and peer influence to entertainment points to changing social dynamics. Policymakers and public health professionals must continue to monitor these trends to develop effective strategies aimed at reducing harmful alcohol consumption across various demographic groups.

DESCRIPTIONS

No financial support.

No conflict of interest.

REFERENCES

1. Kshamaa HG, Aswath M, Shivaraju PT. Behavioural Problems in Adolescent Children of Alcoholics. Selcuk Med J 2020;36(3): 244-251. doi: 10.30733/std.2020.01461

2. Rehm J, Shield KD. Global Burden of Disease and the Impact of Mental and Addictive Disorders. Curr Psychiatry Rep. 2019;21(2):10. doi:10.1007/s11920-019-0997-0

3. Schwarzinger M, Thiébaut SP, Baillot S, Mallet V, Rehm J. Alcohol use disorders and associated chronic disease - a national retrospective cohort study from France [published correction appears in BMC Public Health. 2017 Sep 22;17(1):736. doi: 10.1186/s12889-017-4709-6.

4. Erden S, Nalbant K. Autism Spectrum Disorder and Prenatal Risk Factors. Selcuk Med J 2019;35(4): 282-290.doi: 10.30733/std.2019.00942

5. Günay Molu N, Hisar F. (2021). Sağlık Bilimleri Fakültesi Öğrencilerinin Madde Kullanımı, Ruhsal Durumu ve Şiddet Eğilim Düzeyleri. Genel Sağlık Bilimleri Dergisi,2021; 3(1), 29-40.doi:10.51123/jgehes.2021.15

6. Samokhvalov AV, Popova S, Room R, Ramonas M, Rehm J. Disability associated with alcohol abuse and dependence. Alcohol Clin Exp Res. 2010;34(11):1871-1878. doi:10.1111/j.1530-0277.2010.01275.x

7. Sontate KV, Rahim Kamaluddin M, Naina Mohamed I, et al. Alcohol, Aggression, and Violence: From Public Health to Neuroscience. Front Psychol. 2021;12:699726. Published 2021 Dec 20. doi:10.3389/fpsyg.2021.699726

8. Rehm J. How should prevalence of alcohol use disorders be assessed globally?. Int J Methods Psychiatr Res. 2016;25(2):79-85. doi:10.1002/mpr.1508

9. Türkiye İstatistik Kurumu (2022). Sağlık Araştırmaları Anketi. 01.03.2022 https://www.tuik.gov.tr/Kurumsal/Mikro_Veri.

10. White AM. Gender Differences in the Epidemiology of Alcohol Use and Related Harms in the United States. Alcohol Res. 2020;40(2):01. Published 2020 Oct 29. doi:10.35946/arcr.v40.2.01

11. Alvanzo AA, Storr CL, La Flair L, Green KM, Wagner FA, Crum RM. Race/ethnicity and sex differences in progression from drinking initiation to the development of alcohol dependence. Drug Alcohol Depend. 2011;118(2-3):375-382. doi:10.1016/j.drugalcdep.2011.04.024

12. Agabio R, Pisanu C, Gessa GL, Franconi F. Sex Differences in Alcohol Use Disorder. Curr Med Chem. 2017;24(24):2661-2670. doi:10.2174/0929867323666161202092908

13. Guinle MIB, Sinha R. The Role of Stress, Trauma, and Negative Affect in Alcohol Misuse and Alcohol Use Disorder in Women. Alcohol Res. 2020;40(2):05. Published 2020 Aug 20. doi:10.35946/arcr.v40.2.05

14. Goh CMJ, Asharani PV, Abdin E, et al. Gender differences in alcohol use: a nationwide study in a multiethnic population. International Journal of Mental Health and Addiction, 2024;22(3), 1161-1175. doi:10.1007/s11469-022-00921-y

15. Holzhauer CG, Cucciare M, Epstein EE. Sex and Gender Effects in Recovery From Alcohol Use Disorder. Alcohol Res. 2020;40(3):03. Published 2020 Nov 19. doi:10.35946/arcr.v40.3.03

16. Maxwell AM, Harrison K, Rawls E, Zilverstand A. Gender Differences in the Psychosocial Determinants Underlying the Onset and Maintenance of Alcohol Use Disorder. Front Neurosci. 2022;16:808776. Published 2022 Mar 14. doi:10.3389/fnins.2022.808776.

17. Ünver Ş, Alkan Ö. Sociodemographic factors associated with alcohol use in Turkish women. Journal of Substance Use, 2023; 29(4), 495–500. https://doi.org/10.1080/14659891.2023.2284942

Evaluation of the Effectiveness of Child Emergency Disaster Plan Training in Nursing Students

[ID]Yeliz Suna Dağ[1], [ID]Sümeyye Özarslan[1], [ID]Mehmet Emin Düken[2]

[1]Inonu University, Faculty of Nursing, Paediatric Nursing Department, Malatya, Turkey
[2]Harran University, Faculty of Health Sciences, Department of Nursing, Department of Paediatric Nursing, Şanlıurfa, Turkey

ABSTRACT

Introduction: Children are one of the groups most affected by disasters. Health professionals have an important role to play in the protection and development of children's health in disasters. It is important and necessary to support nurses and nurse candidates, who are a numerically strong group among health professionals, with training in emergency management of children in disasters to reduce the risks that may occur.

Objective: This study was conducted to evaluate the effectiveness of paediatric emergency disaster plan training for nursing students.

Method: This study was conducted as a qualitative study with 40 students studying in the nursing department of a university who participated in the child emergency disaster plan training. An introductory information form and a semi-structured interview form were used to collect the study data.

Results: The mean age of the nursing students who participated in our study was 22.5±0.7 years and 66.6% of them were female. It was found that 92.5% of the students had not received any training on disaster and emergency management in children and 77.5% of them had no information on disaster and emergency plans for children in hospitals. As a result of the analysis of the data, 5 themes were identified: creating a special disaster management plan for children, organising children's emergency services, ensuring and protecting the safety of children, managing orphaned children and providing coordination.

Conclusion: In this study, it was found that the level of knowledge and awareness of nursing students about emergency disaster management for children was inadequate. However, it was found that the training received by the students helped them to become aware of critical issues such as disaster emergency planning for children, organisation of emergency services and management of orphaned children.

Keywords: Children, Disaster Education, Nursing Students.

INTRODUCTION

Health professionals have an important role to play in disaster management because of the services they provide and the responsibilities they assume (1). Nurses, who have the necessary knowledge and skills to intervene quickly and effectively in disasters because of their presence in all areas of health care, are the most important group in disaster management (2,3). The World Health Organization stresses the need for health professionals to be competent to respond to all disasters, regardless of their magnitude (4). The International Council of Nurses (ICN) states that it is important to support nurses, who are among the most important health professionals involved in disasters, with the necessary training curricula for managing disaster processes in order to reduce the problems that may arise (5). In Turkey, which is one of the countries with a high risk of disasters, there is a great need to raise awareness among nursing students about disaster management, emergency planning and health services in disasters (3,6,7). Studies have shown that nurses with little professional experience do not benefit enough from disaster and emergency training and their awareness level is low (7,8). Similarly, it has been reported that nursing students are inadequately prepared for disasters if the necessary educational and practical studies are not provided (3,9). Nursing students can provide care and meet the needs of disaster victims during disasters (10). Therefore, it is important to support nursing students with various disaster management training programmes before they graduate. Studies in the field of disaster education and management have found that the self-efficacy and management perceptions of nursing students who received disaster education increased significantly (6,10). In this context, it has been emphasised that

nursing students should gain experience by taking responsibility in disasters, that applied training using case studies should be increased, and that disaster simulation training should be included in educational curricula (11,12).

In the light of these data, it has been reported that universities should provide more comprehensive disaster training and encourage students to participate in disaster plans to enable nursing students to take an active role in disaster situations (13). In disasters, children are physically, developmentally and socially different from adults. This situation may lead to the need for disaster response services specifically prepared for children in certain age groups (14). Nurses caring for children in disasters should have sufficient knowledge and skills about the needs of children. The National Association of Pediatric Nurse Practitioners (NAPNAP) reports that nurses play an important role in caring for children and their families before, during and after national and global disasters (15). Therefore, it is stated that nurses should be trained in the management of children affected by disasters (15,16). A review of the literature shows that nursing education curricula on disaster management have increased (17). At the same time, there are master's and doctoral programmes related to disaster nursing and it is separated from other fields as a specialty (17-19). An examination of training content reveals a focus on general disaster management, such as first aid and intervention practices, and meeting the basic needs of disaster victims (17,20,21). Despite the increase in training programmes, it is noted that they are not sufficient and need to be improved (17). However, no mention was made of the lack of support for nursing students and no mention was made of the need to improve training curricula in the management of children, one of the groups most affected by disasters.

Some organisations organise trainings for health professionals on the management of children in disasters (22). With these trainings, it is aimed to disseminate Child-Centred Disaster Management. However, increasing the number of health professionals equipped with knowledge and skills related to the systematic management of children in disasters can be achieved by training all nursing students in the early period. It is predicted that nursing students who graduate with adequate educational contents can make great contributions to the systematic management of children in disasters, even though the fields they work in are different. However, when the literature was examined, it was determined that educational activities and researches on the subject were insufficient. In this context, it was thought that participation of nursing students in disaster planning trainings prepared for children could be important. This study was conducted to evaluate the effectiveness of child emergency disaster plan training for nursing students.

METHODS

Study Design

This study was conducted between November-December 2024 in a qualitative descriptive design.

Sample of The Study

The population of the study consisted of 280 students who were studying in the Nursing Department of a university and who were in their final year and had taken the course of Child Health Nursing. In the university where the study was conducted, nursing students take the course Nursing Care and First Aid in Disasters as a compulsory course and the course called Chronic Diseases and Care in Disasters is given as an elective in some semesters. However, there is no detailed course content on the management of children, one of the most specific groups in disasters. Considering that nurses should be equipped with knowledge and skills in disaster management and coordination, the need to support students with different training before graduation comes to the fore. Therefore, in this study it was planned to include nursing students in the training phase in the training to be applied for the management of children in disasters. The contents of the training for the preparation of a child emergency disaster plan and the research plan were explained to the students and an announcement was made about the training. The sample of the study consisted of 40 students who agreed to participate in the study and attended the training regularly.

Data Collection

'Introductory Information Form' and 'Semi-structured Interview Form' prepared by the researchers were used to collect the research data.

Introductory Information Form

The form prepared by the researchers consisted of 6 questions that allowed us to assess the socio-demographic characteristics of nursing students (age and gender), receiving training on disaster management and emergency in children, being a member of a voluntary non-governmental organisation related to disaster or emergency, having knowledge about disaster and emergency plans for children in hospital, having knowledge about the process of classification and prioritisation of paediatric patients in an emergency.

Semi-structured Interview Form

This form consists of 5 questions to explore the experiences of the nursing students involved in the training process, and to determine their level of knowledge and perspectives on the management of children in disasters. Questions: How do you assess the general impact of disasters on children, What are the risks that children may face in disasters and how should children be protected at this stage, How should we organise children's emergency services in disasters, How should child-centred disaster management be, How do you think coordination for children in disasters should be as a result of the training you have received? In order to determine the suitability of the semi-structured interview form, interviews were conducted with 4 researchers who are experts in the field of children's nursing and nursing education, and the questions were revised. In addition, 3 students who had participated in the training were interviewed in advance and the comprehensibility of the questions was assessed.

Interviews

Prior to the start of the research data collection, nursing students who agreed to participate in the study were given detailed information about the purpose, scope, expectations and requirements of voluntary participation. Following the information, focus group interviews were conducted in the meeting room by scheduling a suitable time after training with the students who agreed to participate in the study. Each focus group consisted of 10 students and interviews were conducted with 4 focus groups. To ensure the integrity and consistency of the research, the interviews were only conducted by the same researcher. A voice recorder was used, with the consent of the participants, to fully record the details of the interviews. The focus group interviews lasted approximately 60 to 75 minutes for each group.

Analysis of the Data

In order to analyse the research data, all data recorded on the voice recorder were first transcribed. The data was transcribed from the voice recorder and listened to repeatedly by the researchers to increase accuracy and reliability. The recordings were then listened to repeatedly by the researchers to increase the accuracy and reliability of the data. The data were analysed according to the method described by Colaizzi, in which data collection and analysis took place in a cyclical manner (23). At the end of the Colaizzi process, each researcher received detailed explanations and definitions of the topic, and themes were formed by reinforcing them.

Validity and Reliability

An attempt was made to meet the criteria of validity, reliability, consistency, verifiability and transferability of the study (24). To ensure reliability, the interviews were conducted by the same researchers, audio recorded and transcribed verbatim. Each researcher listened to the audio recordings several times and transcribed them. Meetings were held at regular intervals and similarities and differences in the findings were assessed. In addition, the reliability of the research was increased by seeking expert opinion on the questions and conducting preliminary interviews. To ensure verifiability and consistency, in addition to the main questions in the interviews, additional questions were asked to enable participants to express themselves better, data analysis was carried out separately by three researchers, and meetings were held at regular intervals. This approach allowed the research findings to

be evaluated from different perspectives. The transferability of the data was ensured by including extracts from the participants' speeches in the findings.

Ethical Aspects of the Research

Ethical approval was obtained from the Social and Human Sciences Ethics Committee of a university (2024/273) before the study began. Institutional approval (E-20176953-900--520598) was then obtained. The purpose and content of the study were explained to the students. It was explained that they were free to participate in the research, that the data obtained would be used for scientific purposes, that their personal information would be kept confidential, and that voice recordings would be made during the interviews. Verbal and written consent was obtained from students who agreed to participate in the study. The study was conducted in accordance with the tenets of the Declaration of Helsinki.

RESULTS

The mean age of the nursing students participating in the study was 22.5 ± 0.7 years and 66.6% were female. It was found that 92.5% of the students had not received any training in disaster and emergency management in children, 77.5% had no information about disaster and emergency plans for children in hospitals, 92.5% had insufficient knowledge about the process of classification and prioritisation of child patients in an emergency and 85% were not members of any voluntary non-governmental organisation related to disaster or emergency.

Table 1. Sociodemographic characteristics of students

	N(%)
Mean Age	22.5 ± 0.7
Gender	
Female	30(%66.6)
Male	10(%33.3)
Status of training on disaster management and emergency in children	
Yes	3(%7.5)
No	37(%92.5)
Whether you are a member of a voluntary non-governmental organisation related to disaster or emergency	
Yes	6(%15)
No	34(%85)
Having knowledge about Disaster and Emergency Plans for children in hospital	
None	31(%77.5)
Available	9(%22.5)
Adequacy of knowledge about the process of classification and prioritisation of paediatric patients in an emergency	
Yes	3(%7.5)
No	37(%92.5)

In our study, 5 main themes were identified after the interviews with the students (Table.2).

Table 2. Main Themes

Main Themes
1. Creation of a special disaster management plan for children
2. Organisation of child emergency services
3. Ensuring the safety and protection of children
4. Management of orphaned children
5. Coordination

1. Creation of a special disaster management plan for children

After the training, the students expressed the need to develop a child-specific disaster management plan as part of child-focused disaster management. The students reported that they had learnt that children are more affected by disasters than adults and that their level of exposure may vary according to their age groups, and therefore physical and psychosocial assessment of children in the acute phase of

9

disasters may be important in solving the problems that may arise. However, the students emphasised the need to plan continuous and regular training for health professionals and nursing students in order to carry out the process systematically and programmatically. At the same time, the students reported that it is essential for the hospital management to develop a disaster plan with the health professionals working in the emergency service, paediatric intensive care, neonatal intensive care and other areas where children are cared for and treated in disasters, and that this should be included in the hospital disaster plan.

Some students made the following statements;

'I think I understand better that children are affected differently from adults in disasters and therefore a disaster plan should be created specifically for children. At the same time, children can be affected by disasters at different levels depending on their age. This situation requires that the management of children in disasters should be systematically established.' (Student, 15).

'Considering the impact of disasters on children, physical and psychological parameters should be urgently assessed and appropriate care measures should be planned. In addition, children exposed to disasters should be followed up for a long time and the negative impact of the disaster on the child should be evaluated' (Student, 12).

'We have discussed child-centred disaster management in detail in this training. Nurses working in paediatric wards and paediatric/neonatal intensive care units, especially in paediatric emergencies, should be included in the disaster management plan for children in disasters, and training for health professionals should be held at regular intervals' (student, 9).

'In order to ensure the management of children in disasters, firstly, the management of children in disaster processes should be addressed in more detail in the hospital disaster plan, and the roles of all health professionals should be allocated. Training programmes and special exercises for managing children in disasters should be planned. Even a team dealing with the *management of children in disasters should be established' (student, 29).*

2. Organisation of paediatric emergency services

Students emphasised the importance of paediatric emergency services and general services being adequate and equipped to respond to the management of children in disasters. In particular, in emergency departments of hospitals located in peripheral regions and where adults and children are cared for together, the students reported that it is important to separate the management of adults and children during disasters and to carry out the procedures related to children in a specific area in order to avoid problems that may arise in terms of safety and protection. In addition, the students stated that the triage of all children brought to the emergency department should be carried out by trained and experienced health professionals and a multidisciplinary team. To ensure that emergency departments are equipped to deal with children in disasters, the students stated that continuous and regular drills would reduce problems of organisation and coordination in disasters.

Some student statements;

'...During a disaster, the emergency services should be able to intervene in many cases, allow the triage of all children to be carried out quickly and systematically, support the protection and safety of children and, most importantly, ensure that all necessary treatment and care needs are met...' (Student, 31).

'In the paediatric emergency service, it is necessary to have a team that is particularly experienced and trained and that can provide crisis management. This is because, based on the cases described in the trainings, a chaotic environment may develop during a disaster and different profiles of children may need to be managed. In order to manage the cases you mentioned, you need nurses who work systematically and can provide crisis management' (Student, 11).

'During the trainings we talked about many cases and shared our ideas. The cases you described really show that more than one child may need to be managed at the same time during a disaster and we understand that we may encounter different images. I was very impressed by what you described and

the child emergency situation in the 6 February earthquake, and training alone may not be enough to manage the process. We need to do exercises on the subject and on the child cases you described' (Student, 18).

3. Ensuring the safety and protection of children

Students who participated in our study highlighted that children may be more vulnerable to problems such as abduction, disappearance, neglect and abuse during disasters and the importance of ensuring the protection and safety of unaccompanied children in particular. They noted that children's vulnerability and fragile structures may result in their inability to protect themselves, thus increasing the risks to their safety. Students emphasised the need for a multidisciplinary team consisting of health professionals, family ministry officials and security officers to ensure the safety and protection of children, stating that safe areas should be created for children and a team should be established to take care of children who need to stay in these areas.

Statements from some students;

'In disasters, children can be abducted and lost. For this reason, it is one of the most important and necessary issues to protect and provide security measures for the children who are being treated and cared for, and especially for the children who have no one with them...' (Student, 28).

'They told us that many orphaned children were brought to the emergency room at the time of the disaster and that their families could not be reached for a long time. Some children were brought by their relatives and they could not stay with them all the time. Some children were lost and found after a while. These experiences show us that children can be orphaned and lost. This situation can expose children to risks such as neglect and abuse during disasters. Therefore, children should be protected and moved to safe environments' (Student, 33).

'Protecting children and moving them to safe areas is not something we can do alone. The process should be managed in cooperation with security guards and officials from the Ministry of Family Affairs, who will play an important role in contacting the children's families' (student, 14).

4. Managing orphaned children

The students stated that they realised that there should be a registration, follow-up and evaluation system for the protection of unaccompanied children, in line with the experience shared about the management of unaccompanied children in the emergency services during the 6 February earthquakes. They stated that they had a better understanding of the need to assess the physical and psychosocial needs of unaccompanied children, plan their treatment and care, monitor them in safe environments and strengthen protection measures. They reported that liaising with law enforcement and Family Ministry teams to ensure that children are returned to their families helps to reduce the risk of disappearance, abduction, neglect and abuse. In order to manage unaccompanied minors in a systematic and programmatic way, it may be important to establish a multidisciplinary team, to address them in detail in the hospital emergency plan (HEP) and to ensure the organisation and coordination of experienced and trained health professionals in the event of a disaster.

Statements from some students;

'...During this training process, I knew that many children were lost in the earthquake we experienced, but I did not know that there were so many problems in terms of managing the children. From what you have told us, it is very difficult for us to manage orphans on our own. That is why the necessary training should be organised before the disaster, for health workers and other professionals...' (Student, 4).

'Unaccompanied children may be more vulnerable, fragile and open to abuse than other children during a disaster. For this reason, their families should be reached as soon as possible and they should be placed in a safe environment by meeting all their needs until they are brought to their families...' (Student, 36).

'...In a disaster, not only one missing or orphaned child is brought. Several children may be brought together. Orphaned children may die, be treated and kept under observation, or be transferred to another

hospital. A special recording system should be set up to keep track of all children and coordination between team members should be ensured...' (Student, 29).

5. Coordination

Students emphasised the need for experienced and trained people to organise and coordinate health professionals at the time of disaster in order to manage the disaster in every sense. They expressed the need to form a special team, determine the distribution of tasks, conduct applied training and exercises, and organise all these processes in order to ensure child-centred disaster management mentioned in the training they received and to achieve its objectives. At the same time, they stated that ensuring a strong coordination for the management of children in disasters would be effective in minimising the damage to children and minimising the risks that may develop.

Statements from some students;

There is a great need for trained disaster health workers. Especially experienced, trained and skilled health professionals are needed to coordinate the disaster. Health professionals who will organise and coordinate the management of the disaster should also be identified in advance (Student, 17)'.

''I think one of the most important problems in disasters is to organise and coordinate the management. In fact, health professionals have problems in organising and coordinating, and if they cannot manage the process, the chaos grows even more and the solution becomes difficult' (Student, 5).

'A very corrosive environment is created during a disaster and this situation creates problems in managing the care and treatment process and other needs of children. For this reason, the organisational strategies to be applied in the event of a disaster should be determined before the disaster and included in the content of the disaster plan and included in the drills. Especially at the stage of ensuring the safety of children, training content should be developed and training should be provided to nursing students and nurses...' (Student, 34).

DISCUSSION

Ensuring the systematic management of children in disasters and developing a disaster plan requires the presence of experienced and equipped health professionals. Various guidelines have been developed for nurses and other health professionals to protect children in disasters (16,25-28). Various training programmes for health professionals are organised in many countries (22,29,30). It has been stated that the number of trained health professionals should be increased to include the management of children in the hospital disaster plan (22). However, the need to improve the training of nurses, who constitute a large part of the health workforce, in the management of children in disasters has not been sufficiently addressed. In our study, nursing students were found to have insufficient knowledge and training in this area. When the curricula of many nursing schools were examined, it was found that there was compulsory training in disaster nursing (18, 31, 32). However, it was noted that the training curricula included disaster response and public health interventions. Specific training content for children or other specific groups of people is not common. This situation may make it difficult for post-graduate nurses to manage the process in the event of a disaster. A study conducted after the earthquakes in Turkey found that nurses working in paediatric emergency services had difficulties in triage due to lack of disaster preparedness, knowledge and skills (33). Another study found that nurses experienced coordination problems due to the high number of children admitted to the emergency department and inadequate equipment (34). These results show that nurses should be trained in the management and organisation of children in disasters. In order to increase the number of experienced nurses, it is important to support nursing students with various training programmes. Our study was designed to highlight the importance of supporting nursing students with training programmes in the management of children in disasters. At the same time, this study is one of the first studies to present data on the effectiveness of child disaster management training for nursing students and is a preliminary result for further studies to be planned.

It shows that the training programme increased the students' knowledge and awareness of the holistic assessment of children in disasters and the planning of actions to be taken for the risks that may occur.

Studies have mentioned that training organised for disaster nursing is important in developing the knowledge and skills of nursing students (19,34,35). A study conducted by Alim et al. found that disaster preparedness training for nursing students increased their knowledge and skills (19). Hung et al. showed in their study that disaster nursing training organised for nursing students was effective in developing their knowledge and skills (36). However, published research reports have been effective in the development of nursing education curricula over the past 20 years (17,19). It is suggested that detailed consideration of the content of the undergraduate nursing curriculum can provide a long-term strategy for creating and expanding a competent workforce (36,37). Increasing training programmes and research on specific management of children in disasters can be effective in developing the literature in this area. In the development of educational curricula, it is important to make student participation in planned training mandatory in order to increase the number of nurses with sufficient knowledge and skills. This will contribute to the ability of graduate nurses to provide better crisis management in disasters and to carry out the process systematically (6,10). The literature shows that various methods such as case-based, game-based, applied and technology-based methods are used in disaster education organised for nursing students (11,12,20,21,35,38). These educational methods have been found to contribute significantly to the application of knowledge and management of behaviours in the stages of disaster management and organisation (35,38). In their study, Hosseini et al. showed that game- and case-based disaster education was effective for nursing students in developing different disaster management strategies (38). Aluisio et al. found that the use of case-based simulation improved students' skills more than the normal educational process (39). In line with the findings of this study, it is predicted that the implementation of research and training programmes for nursing students on the management of children in disasters will be useful in ensuring the management of children in disasters. The evaluation of the effectiveness of the training programmes implemented and the publication of the results can contribute greatly to the development of the curriculum.

Nurses and other health professionals are also involved in the development of the hospital disaster plan before the disaster and in the management of the disaster. Nurses' experience of disasters and disaster training processes increase their awareness and are effective in updating the disaster plan (35,38,40). In addition to being equipped with knowledge and skills related to disaster management, their awareness should also be increased in the provision and development of the organisation. Many studies have shown that health professionals experience various problems in providing organisation and coordination during disasters, even though they are trained in disaster care (34,36). Therefore, it is considered that the knowledge and skills of health professionals for disaster management should be improved and training for the processes of providing organisation and coordination should be increased (17,22). In this sense, the creation and implementation of a systematic plan for the management of children in disasters can be provided by health professionals with a high level of awareness. The results of this study show that the students' perspectives were improved by the training on the creation of an emergency disaster plan for children. With the applied training programme, it can be seen that the students emphasised the need to develop different strategies to take the necessary precautions by identifying the risks that may arise for children in disasters. These results also show that awareness has developed. This awareness can have an important impact on the process of developing the hospital disaster plan for systematic management of children in disasters.

CONCLUSIONS

This study showed that the training organised to improve nursing students' skills in managing and caring for children in disasters was effective. The trainings enabled students to gain awareness and skills on issues such as creating child-specific disaster plans, organising emergency services, and ensuring the safety of orphaned children. Accordingly, it is recommended that child-specific disaster nursing issues be fully integrated into the nursing curriculum and that practical training in this area be intensified.

DESCRIPTIONS

No financial support.

No conflict of interest.

REFERENCES

1. Yıldırım M, Bozdağ F, Başdaş Ö. Experiences of nursing students providing support in disaster areas: A qualitative study, Public Health Nursing. 2024; 1622–1632. https://doi.org/10.1111/phn.13412

2. Özpulat F, Kabasakal E. Knowledge Levels of Nursing Students on Disaster Nursing and Their State of Disaster Preparedness', International Journal of Medical Research Health Sciences. 2018; 7(8), pp. 165–174.

3. Avcı S, Kaplan B, Ortabağ T. Hemşirelik Bölümündeki Öğrencilerin Afet Konusundaki Bilgi ve Bilinç Düzeyleri, Resilience. 2020; 4(1): 89–101. https://doi.org/10.32569/resilience.619897

4. World Health Organization [WHO]. Western Pacific Regional Framework for Action for Disaster Risk Management for Health: Emergencies and Disasters. Regional Office for the Western Pacific, Philippines, 34-47. https://apps.who.int/iris/bitstream/handle/10665/208200/9789290617082_eng.pdf (Accessed 28 November 2024).

5. International Council of Nurses (ICN). Disaster planning and relief. http:// www. icn. ch/ images/ stories/ documents/ publications/ fact_sheets/ 5a_FSDisaster Respons e.pdf (Accessed 07 December 2023).

6. Erkin Ö, Yenigün S, Gümüş C, Coşğun M, Aslan G. Afet ve Acil Durum Yönetimi Başkanlığı (AFAD) Afet Eğitimlerinin Hemşirelik Öğrencilerinin Afet Yönetimi Algısına Etkisi', Afet ve Risk Dergisi. 2024; 7(1): 47–61. https://doi.org/10.35341/afet.1420631

7. İytemur A, Tekeli Yeşil S. Bir Üniversite Hastanesinde Çalışan Hemşirelerin Hastane Afet ve Acil Durum Planları ile İlgili Görüşlerinin İncelenmesi, Hacettepe Üniversitesi Hemşirelik Fakültesi Dergisi. 2020; 7(2): 138–48. https://doi.org/10.31125/hunhemsire.763162

8. Grimes A, Sparke V, Rouen C,West C. Preparedness and resilience of student nurses in Northern Queensland Australia for disasters, International Journal of Disaster Risk Reduction. 2020; 48: 101585. https://doi.org/10.1016/j.ijdrr.2020.101585

9. Satoh M, Iwamitsu H, Yamada E et al. Disaster Nursing Knowledge and Competencies Among Nursing University Students Participated in Relief Activities Following the 2016 Kumamoto Earthquakes', SAGE Open Nursing. 2020; 4: 1–9. https://doi.org/10.1177/2377960818804918

10. Keskin AY, Alan H. Assessment of Undergraduate Nursing Students' Self-Efficiency in Disaster Response', E-Journal of Dokuz Eylul University Nursing Faculty. 2023; 16(3): 332–42. https://doi.org/10.46483/jnef.1327474

11. Dinh TTH, Tori K, Hines S. Interprofessional disaster exercises for undergraduate nursing students: a scoping review', JBI Evidence Synthesis. 2023; 21(12): 2281–308. doi: 10.11124/JBIES-22-00221.

12. Ljunggren F, Moen IL, Rosengren K. How to be Prepared as a Disaster Nursing: An Interview Study With Nursing Students in Indonesia', Health in Emergencies and Disasters Quarterly. 2019; 5(1): 53–62. doi: 10.32598/hdq.5.1.334.1.

13. Taşkıran G, Baykal Ü. Disasters and Nurses' Preparedness for Disasters in Turkey: Literature Review', Sağlık ve Hemşirelik Yönetimi Dergisi. 2017; 4(2): 79–88. doi: 10.5222/shyd.2017.079.

14. Manav G, Nazik F. Doğal Afetlerde Çocuk Sağlığı ve Pediatri Hemşiresinin Rolü, Gevher Nesibe Journal of Medical & Health Sciences. 2023; 8(2): 347–53.

15. The National Association of Pediatric Nurse Practitioners(NAPNAP). Position Statement. Pediatric Nurse Practitioners' Role in Disasters Involving Children. Journal of Pediatric Health Care. 2011; 25(4): 9A-10A.

16. Fox L, Timm N. Pediatric Issues in Disaster Preparedness: Meeting the Educational Needs of Nurses-Are We There Yet?', Journal of Pediatric Nursing. 2008; 23(2): 145–52. https://doi.org/10.1016/j.pedn.2007.12.008

17. Loke AY, Guo C, Molassiotis A. Development of disaster nursing education and training programs in the past 20 years (2000–2019): A systematic review. Nurse Education Today. 2021; 99: 104809. https://doi.org/10.1016/j.nedt.2021.104809

18. Yale University, Educatıon of Nursing Student. https://nursing.yale.edu/search/node/Educational%20content (Accepted Date: 16.12.2024).

19. Labrague LJ, Hammad K, Gloe DS et al. Disaster preparedness among nurses: a systematic review of literature. International Nursing Review. 2018; 65(1): 41-53. https://doi.org/10.1111/inr.12369

20. Inkaew W, Chompunud S. Effects of an interactive teaching method on perceived disaster nursing competencies of undergraduate nursing students. Health Emergency and Disaster Nursing. 2018; 5(1): 25-31. https://doi.org/10.24298/hedn.2016-0008

21. Huh SS, Kang HY. Effects of an educational program on disaster nursing competency, Public Health Nursing. 2019; 36(1): 28-35. https://doi.org/10.1111/phn.12557

22. Pediatric Disaster Centers of Excellence. Only 47% of hospitals have a disaster plan that includes pediatric patients. And we're working to improve that. https://www.pediatricdisaster.org/ (Accepted Date: 16.12.2024).

23. Colaizzi PF. Existential phenomenological alternatives for psychology, Psychological Research as the Phenomenologist Views It/Oxford University Press. 1978: 48-71

24. Polit DF, Beck CT. Generalization in quantitative and qualitative research: Myths and strategies. International Journal Of Nursing Studies. 2010; 47(11): 1451-1458. https://doi.org/10.1016/j.ijnurstu.2010.06.004

25. Afetlerde Ve Acil Durumlarda Sağlık Hizmetleri Yönetmeliği.https://www.resmigazete.gov.tr/eskiler/2021/05/20210525-3.htm (Accessed 09 December 2023).

26. Directorate of Healthy Services. https://dhs.kerala.gov.in, https://dhs.kerala.gov.in/en/sample-page/ (Accessed 10 December 2023).

27. Assam State Disaster Management Authority. https://www.asdma.gov.in/studies&projects.html (Accessed 10 December 2023).

28. The National Disaster & Emergency Management University. https://search.usa.gov/search?affiliate=netc&query=nurse (Accessed 11 December 2023).

29. Disaster Preparedness, The California Child Care Disaster Plan. https://cchp.ucsf.edu/resources/disaster-preparedness (Accessed 12 December 2023).

30. Afetlerde Çocuk Acil Hemşireliği Kursu. https://www.inonu.edu.tr/inuhaber/haber/5016/tubitak-destekli-afetlerde-cocuk-acil-hemsireligi-kursu-basladi (Accessed 08 December 2023).

31. Yüksek Öğretim Kurumu. https://www.yok.gov.tr/Documents/Kurumsal/egitim_ogretim_dairesi/Ulusal-cekirdek-egitimi-programlari/hemsirelik_cekirdek_egitim_programi.pdf

32. https://nursing.yale.edu/search/node/Educational%20content

33. Topal S, Özhanlı Y, Çaka SY, Gürbüz Y. Professional competences of emergency department nurses working in the earthquake region on triage management in children and the difficulties experienced by nurses in the decision-making process: A qualitative study. International Journal of Disaster Risk Reduction. 2024; 113: 104844.

34. Dağ YS, Zengin M, Yayan EH, Dağ S. Understanding the impact of natural disasters on children within first hours and days after an event: A phenomenological study through the experience of nurses. International Nursing Review. 2024. https://doi.org/10.1111/inr.13031

35. Hung MSY, Lam SKK, Chow MCM, et. al. The effectiveness of disaster education for undergraduate nursing students' knowledge, willingness, and perceived ability: An evaluation study. International journal of environmental research and public health. 2021; 18(19): 10545. https://doi.org/10.3390/ijerph181910545

36. Disaster Child Civil Coordination Team. Children unaccompanied, system inadequate. https://afetcocuk.koordinasyon.org/cocuklar-refakatsiz-sistem-yetersiz/ (Accessed 26 November 2024).

37. Alim S, Kawabata M, Nakazawa M. Evaluation of disaster preparedness training and disaster drill for nursing students. Nurse education today. 2015; 35(1): 25-31. https://doi.org/10.1016/j.nedt.2014.04.016

38. Hosseini MM, Hosseini TM, Qayumi K, Baeradeh N. Game-based vs. case-based training for increasing knowledge and behavioral fluency of nurse students regarding crisis and disaster management; a quasi-experimental study. Archives of Academic Emergency Medicine. 2022; 10(1). https://doi.org/10.22037/aaem.v10i1.1739

39. Aluisio AR, Daniel P, Grock A et al. Case-based learning outperformed simulation exercises in disaster preparedness education among nursing trainees in India: A randomized controlled trial. Prehospital and disaster medicine. 2016; 31(5): 516-23.

40. Ituma OW, Ranse J, Bail K, Hutton A. Disaster education for Australian nursing students: An integrative review of published literature to inform curricula. Collegian. 2022; 29(1): 93-9. https://doi.org/10.1016/j.colegn.2021.04.005

Evaluation of Physiotherapy and Rehabilitation Undergraduate Students' of Clinical Practice Skills

iD **Yunus Emre Kundakcı**[1], iD **Serpil Kalkan**[1], iD **Rabia Koca**[1], iD **Gülşen Taşkın**[1],

iD **Fatma Eken**[1], iD **Emel Taşvuran Horata**[2]

[1]Department of Physiotherapy and Rehabilitation, Afyonkarahisar Health Sciences University, Afyonkarahisar, Turkey
[2]Department of Physiotherapy and Rehabilitation, Sakarya University of Applied Sciences, Sakarya, Turkey

ABSTRACT

Introduction: Clinical practice courses in physiotherapy are very important for training clinically competent physiotherapists. The quality of students' clinical skills training can be enhanced by rigorously monitoring and assessing their performance in these environments.
Objective: To evaluate the observations and practices in the course forms used in the clinical practice education of physiotherapy students.
Methods: In this descriptive study, the clinical practice education of fourth-year physiotherapy students was evaluated with forms filled out by 170 students in the 2022-2023 academic year.
Results: Students achieved the minimum number of observations and applications specified in the forms for each application. The observations, evaluations and applications made by the students in clinical practice are as follows: It was found that there were exercise applications with 10.37%, electrotherapy applications with 9.49% and some evaluation methods (pain, joint range of motion and muscle strength) with 5.4%. On the other hand, there was limited participation in some neonatal assessments/applications and some specific electrotherapy (biofeedback, iontophoresis and hydrotherapy) approaches. Students mostly participated in exercises for general physiotherapy and neurological rehabilitation units. The students used electrotherapy methods mainly in pediatric and orthopedic therapies.
Conclusion: The clinical practice forms tried for the first time in this study made a limited contribution to monitoring the clinical practice performance of students. Forms have the potential to provide feedback to students and educators in areas such as planning and supervision. Ensuring that students are involved in the development of the forms and getting their views can be useful.

Keywords: Clinical Practice, Quality Processes, Physiotherapy Education, Physiotherapy Students.

INTRODUCTION

Physiotherapy education is critical in preparing a clinically competent physiotherapist by providing the integration of clinical practice and clinical experiences (1). In the physiotherapy curriculum, the final year of undergraduate education is the most practical stage of gaining hands-on experience with patients, and the focus is on developing students' clinical skills. During clinical practice, approaches that can improve students' practical reasoning skills and make them more competent in their professional lives have been studied (2-4). Most of these studies cover the teaching methods of physiotherapy students in clinical practice. However, although the goals are common, the curricula of fourth-year undergraduate students may differ between countries and regions, especially during clinical practice. New national and international reforms are needed to ensure that the role of physiotherapy in the health system is expanded (5). Studies emphasize the importance of a physiotherapy curriculum based on national and country-specific needs (6).

The development and delivery of clinical education, including national competencies, in physiotherapy and rehabilitation (PTR) undergraduate programmes in Turkey is guided by the PTR National Core Education Program (NCEP) published in 2016 (7). In the NCEP 2016, the specific competencies in the

PTR undergraduate program have been developed under three headings; Knowledge and Foresight, Skill and Attitude. Four-year PTR undergraduate programs are designed according to the biopsychosocial model. The topics and contents related to the main components of the profession have been determined under the titles of basic sciences, psychosocial sciences, professionalism, and ethics. Additionally, the topics and contents of professional knowledge training include addressing problems based on impairment, activity, participation level, and disease within the framework of international function classification and resolving them with the clinical decision-making process. The list of skills related to basic PTR applications is defined as *"It includes basic PTR applications and related skills that the physiotherapist who graduates from the PTR undergraduate program must perform and manage at certain levels."* (7).

Clinical practice education aimed at increasing the experience and skills of undergraduate students is a core component of physiotherapy practice and the undergraduate curriculum (8, 9). The professional practice of physiotherapists is constantly evolving and these developments need to be reflected in competencies, program criteria, and standards (6). Thus, lecturers have various responsibilities such as developing effective pedagogical strategies, enhancing students' professional development, and guiding the development of their professional identity (10,11). With this aim, new improvements are proposed for the content, functioning, evaluation, and performance monitoring of the courses in the curriculum to increase the quality and standardization of undergraduate education in physiotherapy (1,5,11-14). Therefore, it is necessary to focus more on clinical practice education, which is related to both the educational curriculum and competence in professional life. Especially in the education of a qualified physiotherapist in the field, the development and implementation of undergraduate education within the framework of a competence-based approach is embraced (15). Competence is linked to measurable, permanent and trainable behaviors that contribute to the performance of activities that indicate whether a person is competent to perform their professional role to a defined standard. Activities are time-limited, trainable, and measurable task groups that draw on knowledge, skills, values, and attitudes (16). The World Physiotherapy Association (WPA) defined competence as *"the proven ability to use knowledge, skills and personal, social and methodological abilities in practice or study situations and in professional and personal development"* in the Physiotherapy Education Guide published in 2021 (12). Additionally, competence is a physical therapist's ability to practice safely and effectively in complex situations (12).

Evaluating and monitoring the practice skills of PTR students and the variety of cases they take in fourth-year clinical practice courses according to the national competencies specified in NCEP may allow PTR educators to obtain an idea about whether fourth-year students have reached professional competence before graduation. Additionally, a critical need to restructure, clarify, and unify clinical performance evaluations has recently been reported by international professional organizations such as the American Physical Therapy Association (APTA) (17).

This study aimed to evaluate the development process of clinical practice course forms of physiotherapy students at a local university and the first results obtained from student report cards. This report card included the number of cases seen by fourth-year physiotherapy students in clinical practice courses, the variety of cases, and the number and variety of PTR-specific applications. We hope that the clinical practice forms presented in this study will shed light on the development of curricula for PTR undergraduate students.

METHOD

Study Design And Ethical Approval

This descriptive study was approved by the Afyonkarahisar Health Science University Clinical Research Ethics Committee (approval number: 2023/165, date: April 7, 2023).The ethical rules of the Declaration of Helsinki (2013) were taken into consideration at all stages of this study.

Study Procedure

In the study, the student report cards of fourth-year students who completed the clinical practice course in the 2022–2023 academic year were used. These report cards covered the number of applications and

observations made by the student under the supervision of the practice education supervisor between July 2022 and July 2023. At the start of the 2022-2023 academic year, the consultant lecturer gave a seminar on the updated clinical practice guidelines to students enrolled in the course. The content of the seminar was about recording the number of applications and observations in clinical practices on student report cards and following the course rotation processes. After the seminar, clinical practice forms were distributed to the students.

Clinical Practice Guideline

To increase the student's professional knowledge, clinical practice courses involve rotating through one or more departments of the relevant institution under the supervision of the practice education supervisor. The courses are conducted in the form of maintaining practical skills on patients for one semester. Students attend full-time and face-to-face courses in groups of 30–40 at the university's Health Application and Research Center, located on the same campus as the university. These courses end with the completion of clinical practice forms, submission of the forms to the practice education supervisor, and two theoretical and practical exams administered by the practice education supervisor.

In clinical practice courses, students continue their education as a result of rotations determined by the clinical practice coordinatorship. The main rotation areas include neurological rehabilitation and orthopedic rehabilitation units, and other rotation areas include pediatric rehabilitation and general PTR units. Students complete at least two rotations in these practice units in one semester and take a total of 35 hours of weekly courses.

Developments About The Creation Of Clinical Practice Guide And Course Forms

PTR department academic staff held meetings in the department to make improvements and development studies on clinical practice courses and to determine various procedures and principles related to the course. The PTR department head, department faculty members, pratic education coordinator, and rotation-responsible physiotherapists who supervise the students in the clinic attended these meetings. During the meetings, which lasted approximately two months, various discussions were held on clinical practice courses, such as teaching the course, identifying students, the participation of students during the course, monitoring student performances, and end-of-course evaluations. The main topics were identified. These were then used to improve the course forms (Figure 1). Finally, the guide for clinical practice courses has been approved by the Faculty Education Commission, effective in the 2022-2023 academic year. The current updated clinical practice guideline includes various terms and descriptions presented in Table 1. Additionally, the new clinical practice guideline includes a workflow to evaluate and monitor students' clinical practice performance: (1) Students fill out the student practice registration form and submit it to the practice education supervisor after each rotation; (2) The practice education supervisor reviews the registration form submitted by the student and after approval, this data is recorded in the student report card; (3) The practice education supervisor fills out the clinical practice assessment form; (4) The practice education supervisor delivers the above-described approved forms, three for each student, to the clinical practice coordinatorship (Figure 2).

Obtaining the opinion of the Quality Unit while preparing course forms to ensure university quality standards.

- During the quality processes for the clinical practice course, Plan-Do-Study-Act cycles were used.

Identify the areas of competence in basic physiotherapy practice that graduates of the PTR programme are expected to have at the end of the programme.

- Recommendations of WPA and NCEP regarding clinical practice education of physiotherapy students were taken into consideration.

Assessment of the capacity of the university and the region for the provision of PTR services to patients.

- The number of applications and observations expected from the students was determined by the consensus of each department and application education officer within the possibilities of the university and the department.
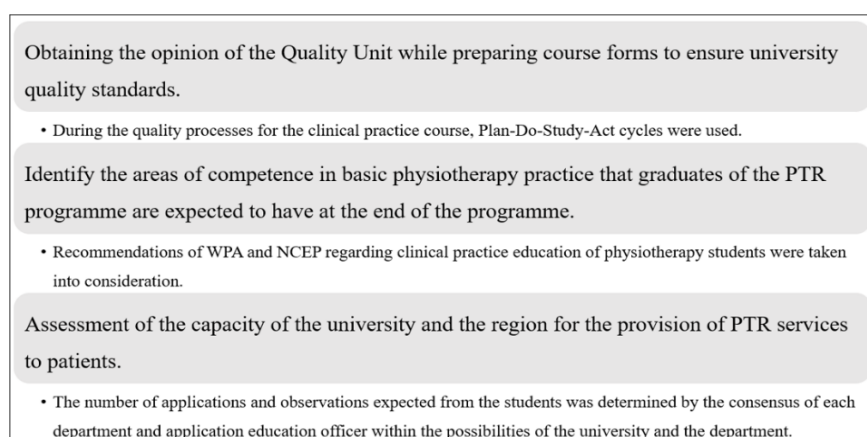
Figure 1. Major Areas for Improvement in Meetings Held for Clinical Practice Guideline.
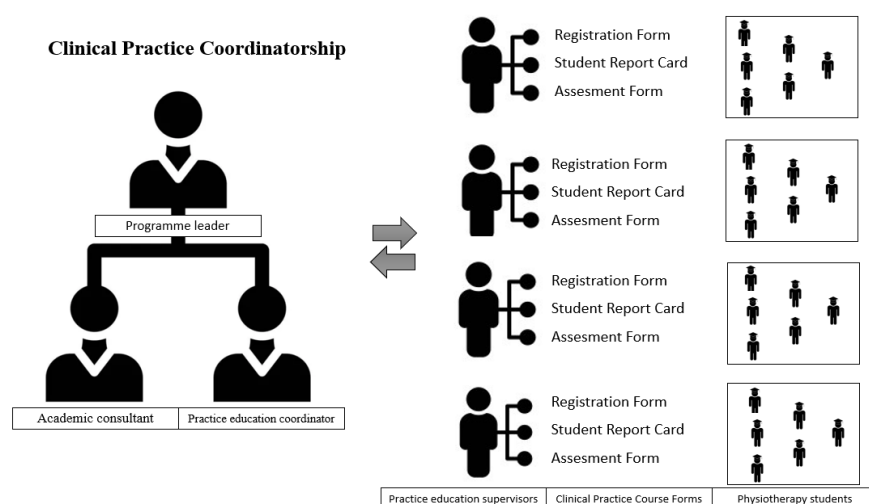
Figure 2. Workflow for Monitoring and Evaluating The Clinical Practice Course.

Data Collection

Before the data analysis, the documents containing the forms filled out by the students for the clinical practice course were received from the coordinatorship. During data processing, no missing data was encountered as these forms were previously approved by the rotation manager and the coordinatorship. The data were entered into the Excel program by three researchers. It was also checked by another researcher. At the end of the data processing process of the study, the documents were delivered to the student affairs office and archived.

Statistical Analysis

The data collected within the scope of the research were evaluated through the Microsoft Excel (Microsoft Excel for Office 365, version 1711; Microsoft Corporation, Redmond,Washington, USA) software program. A descriptive analysis was performed. Maximum and minimum frequencies and percentages were calculated for quantitative variables. Frequencies were calculated for qualitative variables.

RESULTS

The data of the study consisted of professional evaluations, observations and practices carried out by students taking the physiotherapy clinical practice course. The study included student report cards of 170 students. The student's mean aged was 22.93±3.88; 74.7% were female and 25.3% were male.

Table 1. Terms and Their Explanations in The Clinical Practice Guideline.

Terms	Explanations
Clinical practice coordinatorship	The coordinatorship consists of the programme leader, one or more academic consultants and a practical training coordinator
Academic consultant	One of the faculty members assigned by the programme leader to advise the students taking the clinical practice course
Pratice education coordinator	Institutional physiotherapist who ensures the organisation of the students during the clinical practice
Practice education supervisor	The physiotherapist of the institution that provides education to the student physiotherapist and supervises the student in rotations
Student physiotherapist	A 4th grade student who is entitled to take the clinical practice course
Student practice registration form	Clinical practice course application and observation numbers to be filled by student physiotherapist
Clinical practice course student report card	The form to be filled in at the end of the rotation by examining the student registration forms by the supervisor
Clinical practice assessment form	Guidance on the clinical practice course lecture notes to be given by the supervisor at the end of the rotation

Student report cards were prepared in the rotations carried out in four units (general physiotherapy, pediatrics, neurology, and orthopedics) according to the assessment, observation, and practice subtitles

in the reports, and study data were analyzed following these reports. Accordingly, the ten most and least used assessments or practices are listed in Table 2. Among the ten most used practices, exercise practices were the most popular with 10.37%. This was followed by some electrotherapy practices with 9.49% and some assessment methods (pain, joint range of motion, muscle strength) with 5.4%. The least frequently performed assessments or practices included some neonatal assessments/practices and some specific electrotherapy (biofeedback, iontophoresis) and hydrotherapy approaches.

Table 2. The Ten Most and Least Used Clinical Assessment and Applications.

Clinical assessment and applications	Maximum N (%)	Clinical assessment and applications	Minimum N (%)
Therapeutic exercises (P)	31554 (4.13)	Biofeedback applications (P/O)	1403 (0.18)
Applications of electrotherapy (P/O)	20860 (2.73)	Physical examination of the newborn (head circumference measurement, extremities, torticollis) (P/O)	1351 (0.18)
Superficial heat agents (P/O)	18389 (2.41)	Pool and spa applications (P/O)	1232 (0.16)
Deep heat agents (P/O)	16779 (2.20)	Iontophoresis applications (P/O)	1215 (0.16)
Use of electrotherapy modalities in early and late rehabilitation (P/O)	16410 (2.15)	Newborn normal motor development screening tests (P/O)	1181 (0.15)
Use of therapeutic exercises in early and late rehabilitation (P/O)	16295 (2.13)	Reflex control of the newborn (P)	1174 (0.15)
Home exercise program (P)	15750 (2.06)	Physiotherapy and rehabilitation in pediatric cancers (P/O)	714 (0.09)
Pain assessment (P/O)	13767 (1.8)	Physiotherapy and rehabilitation in neonatal intensive care (O)	662 (0.09)
Range of motion assessment (P/O)	13735 (1.8)	Taping in pediatric physiotherapy and rehabilitation (P/O)	282 (0.04)
Muscle strength assessment (P/O)	13571 (1.78)	Animal-assisted therapy approaches in pediatric rehabilitation (P/O)	0 (0.0)

N: Number; %: Prevalence; P: Practice; O: Observation.

The three most and least used approaches by units are listed in Table 3. Accordingly, the most used approach in general physiotherapy was exercise, while the least used approach was iontophoresis applications. While stimulation techniques are mostly used in pediatric rehabilitation, animal-assisted therapy approaches have never been used. While exercises were the most used in neurological patients, cardiovascular assessment methods were the least used. In orthopedic unıt, electrotherapy modalities were used the most, and continuous passive motion application was used the least. The percentages and pie chart of the clinical assessment and applications used in the units are shown in Figure 3.
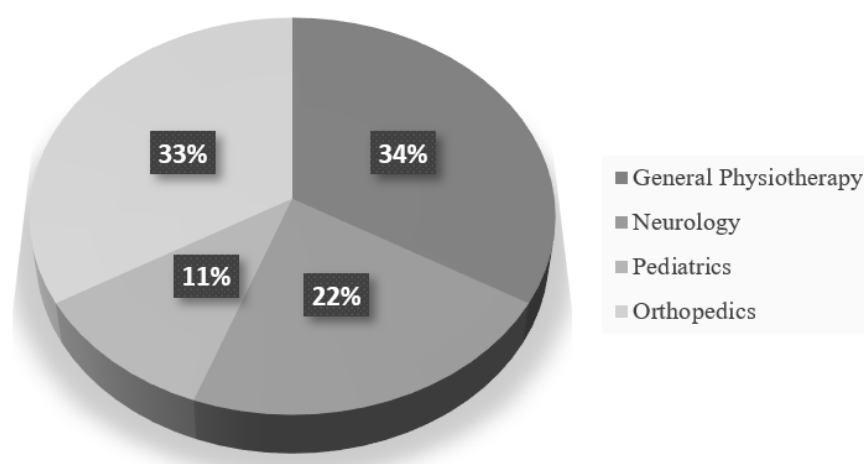

Figure 3. Overall Percentage of Approaches Used by Units.

Table 3. The Three Most and Least Used Clinical Assessment and Applications by Units.

	General Physiotherapy		Pediatrics		Neurology		Orthopedics	
	Clinical assessment and applications	N(%)	Clinical assessment and applications	N(%)	Clinical assessment and applications	N(%)	Clinical assessment and applications	N(%)
Maximum	Therapeutic exercises (P)	31554 (4.13)	Applications of electrical stimulation in pediatric rehabilitation (P/O)	9617 (1.26)	Therapeutic exercises in neurological patients (P/O)	11205 (1.47)	Applicationsof electrotherapy modalities in early and late rehabilitation (P/O)	16410 (2.15)
	Electrotherapy current applications (P/O)	20860 (2.73)	Using adaptive equipment in pediatric rehabilitation (standing table, triangular wedge, etc.) (P/O)	8992 (1.18)	Balance assessment (P/O)	10975 (1.44)	Applications of therapeutic exercises in early and late rehabilitation (P/O)	16295 (2.13)
	Superficial heat agents (P/O)	18389 (2.41)	Assessment of activity and participation in pediatric rehabilitation (P/O)	6300 (0.83)	Coordination assessment (P/O)	10807 (1.42)	Pain assessment (P/O)	13767 (1.8)
Minimum	Biofeedback (P/O)	1403 (0.18)	Physiotherapy and rehabilitation in neonatal intensive care (O)	662 (0.09)	Physiotherapy assessment and application in ALS and other MN diseases (P/O)	2247 (0.29)	Assessment of assistive device use (P/O)	5492 (0.72)
	Pool and spa applications (P/O)	1232 (0.16)	Taping (P/O) in pediatric physiotherapy and rehabilitation	282 (0.04)	Physiotherapy assessment and application in polyneuropathies (P/O)	2234 (0.29)	Discharge training (P/O)	4550 (0.6)
	Iontophoresis applications (P/O)	1215 (0.16)	Animal-assisted therapy in pediatric rehabilitation (P/O)	0 (0.0)	Cardiovascular system assessment of neurological disease (P/O)	2186 (0.29)	CPM applications (P/O)	2942 (0.39)

N: Number, %: Prevelance; P: Practice; O: Observation; ALS: Amyotrophic lateral sclerosis; MN: Motor neuron; CPM: Continuous passive motion.

DISCUSSION

In this study, a clinical practice guide was developed to monitor, measure and evaluate the clinical practice performance of students in clinical practice courses at the PTR department of a local university. The findings from the student report cards in this study not only show the useful aspects of the clinical practice course forms included in this guideline, but also point to several new implications or measures that need to be taken to improve them. The clinical practice guideline can be useful for monitoring how much students practice in which areas in clinical practice courses. It can give an idea about the areas in which students have gained experience. However, although it is seen that the students have reached the expected practical numbers, it still limits commenting on the nature and quality of the education provided. In the discussion section, the forms discussed within the scope of the study are presented together with the literature.

It was observed that fourth-year students at this university had more practice and observation numbers in general physiotherapy and orthopedic rotation areas compared to other rotation areas. Students gained more experience in therapeutic exercise applications, electrotherapy and heat agents, range of motion and muscle strength. These findings are probably due to the frequent use of these methods in physiotherapy practice rather than students' preferences (18). In addition, especially in their rotations in the field of pediatric physiotherapy, students had fewer practices and observations. The relatively low participation of students in this unit may have been influenced by variations depending on the patients

applying and/or the clinical conditions of the university. Generally, it is expected that the number of inpatients in the pediatric unit and the number of outpatients is lower than in other areas. On the other hand, when preparing the pediatric forms, it was not stated whether the specific types of interventions selected (e.g., animal-assisted interventions) might or might not be an opportunity to be carried out by the students. These findings supported a recommendation in the APTA Clinical Performance Instruments (CPI), which was reported at a time almost parallel to our study. APTA stated that CPIs may be graded as 'Not Applicable' for one or more of the performance criteria depending on the clinical setting in which students work (e.g., pediatrics) (19). From this perspective, the number of practices and observations that were underreported in the student report cards in our study should be updated by taking into account the recommendations in APTA CPIs. The researchers decided to update the forms by taking into account the students' opportunity areas in clinical practice in the new forms to be created in the future.

APTA updated the CPIs, which were designed in 1997 and revised in 2006 to evaluate student performance during clinical experiences, in 2023 (19). CPIs are completed by clinical instructors at midterm and at the end of the clinical experience. Students also complete a self-assessment using the same tool. During the student's clinical experience, the clinical instructor provides opportunities that allow the student to practice specific skills and behaviors (20). This new revision was made due to shortcomings in some performance criteria identified in previous CPIs (21,22). In our study, prominent shortcomings in monitoring the performance of PTR students in clinical practice areas were identified. Here, in line with the processes followed by APTA in CPI, three different forms were designed that were filled out by both the students and the clinical instructor, whom we defined as the practice education supervisor.

In the first form of the clinical practice guideline, students filled in the number of weekly applications and observations for each rotation. In this way, we aimed to ensure that students knew what was expected of them when filling out the registration forms. For this reason, the environment provided to students provided them with the opportunity to evaluate themselves, at least partially. In fact, it can be thought of as pre-notification and feedback. This process can be considered as a pre-notification phase in which the expected clinical practices are presented to the students. The pre-notification method, as a very popular research area in the field of education in recent years, covers the processes about task expectations, task-related objectives, criteria, quality and standards before students undertake a task (23). In addition, the fact that the application areas for students in clinical practices are carried out within a clearly defined framework and are followed by student notifications is similar to the tools used in physiotherapy programs in various countries, such as Canada (11).

The second form, which we define as the student report card, consists of the physiotherapist responsible for the rotation checking the student registration forms and reporting the total number of applications and observations at the end of the rotation. This was to check that the students had achieved sufficient clinical practice and observation numbers during the rotation. On the other hand, student report cards provide a similar pre-notification process for the practice education supervisor as for the students. In a previous study, clinical educators in the field of PTR reported that students were willing to be informed in advance, particularly about issues that affect student performance. Additionally, researchers have stated that if students fill out a learning needs form before each clinical practice, physiotherapy programs can identify students' educational needs and provide clinical instructors with proactive strategies to facilitate learning (24).

In the third form, the relevant rotation included *evaluation forms* that collected the students' attendance to the course, awareness of responsibility, attitude, and behavior, and the student's knowledge and productivity under four main headings. This form was graded by the practice education supervisor out of 100 points in total. If this grade is less than 60, the student is considered unsuccessful and loses the right to take the final exam at the end of the semester. The student repeats the failed rotation. Since this form was sufficient for all the students included in the study, it led us to conclude that the expected benefits of the previous two forms were achieved. The researchers agreed that students should be assessed not only for competencies in clinical skills but also for various job responsibilities, patient communications, and workplace discipline. On the other hand, it can be said that it is also suitable for

the use of CPIs previously determined by APTA "to guide the decision of clinical education directors/managers regarding the student's pass/fail status for the final year of clinical experience." (25).

Clinical education provides opportunities for students to integrate knowledge, skills, and attitudes and apply them in a clinical setting, enabling the student to become a competent, and autonomous practitioner (26). Studies continue to update and develop performance criteria in clinical practices in the field of physiotherapy around the world (19). Professional physiotherapy practice is constantly evolving. These developments should be reflected in qualifications, program criteria, and standards (6). More than 100 departments are providing PTR education at the undergraduate level in Turkey, and the occupancy rate of these departments is over 95% (27,28). Organizing the PTR undergraduate program in Turkey according to the core curriculum and implementing national and international accreditation processes in these departments, including the Bologna process, are the strengths of PTR undergraduate education in Turkey (27). Involving undergraduate students, who are among the key stakeholders in quality processes, in the process, monitoring their own professional and individual development, supporting their academic development, and receiving their feedback make very important contributions to the functioning of the process (29). In this respect, the study has the potential to contribute to future development studies on physiotherapist education in Turkey. However, the fact that students' opinions were not taken taken into account while preparing the current forms indicates the necessity of including students as stakeholders in similar studies to be conducted in the coming years. This is an inference that can enable the integration of undergraduate students into quality processes. We plan to have students contribute more to the process in the future. We intend to review the forms developed in our study at certain intervals over the years, taking into account the documentation and terminology of the NCEP, which we anticipate will be updated soon, and consultation with the internal and external stakeholders of the university as recommended by international institutions and organizations such as APTA (19,25,30).

Clinical practice is considered the most stressful module for undergraduate physiotherapy students. Similarly, previous studies have also reported that teaching students can be burdensome and stressful for clinical educators in terms of some factors, such as difficulties in supervising underperforming students and workloads in supervising multiple students at the same time (4,31-33). From this perspective, existing student report cards can support the practice education supervisor's student monitoring and evaluation process. All of the thresholds in the proficiency criteria in the student report cards in the study were achieved by the students. We think that these report cards have the potential to encourage students to practice and observe independently of the clinical instructor. We emphasize that this can be effective in reducing the stress on the practice education supervisor and the student.

The current study has some limitations. The fact that this study was conducted at a local university, with a single group of students and limited educators limits the generalizability of the findings. The aim and scope of the study are to improve clinical practice training in a single center. For this reason, it should be kept in mind that recommendations for clinical practice will be limited. On the other hand, the scarcity of similar studies at the national level makes it difficult to compare the findings with the existing literature. Feedback interviews with students after graduation or the completion of their practicum could have provided more information about the applicability of the forms. Also, feedback from graduated physiotherapists about clinical practice courses can be obtained to further improve quality processes. Although there are limitations in the current study, the fact that researchers have developed clinical practice forms within the framework of quality, and discussing the deficiencies that arise after the use of the forms can be considered an opportunity. In the field of physiotherapy, studies on quality focus more on post-graduate physiotherapists (34,35). In a recently published review focusing on quality education in physiotherapy students, it was reported that there were deficiencies in quality measures that included faculty observation and evaluation of students during clinical training (36). Quality improvement studies are of great importance in terms of improving training in clinical skills in physiotherapy (35). There should be adequate opportunities for students to acquire clinical competencies, demonstrate professional skills and behavior, and meet the expectations set out in this framework. The individual experience of each student, which may differ between students, should be monitored throughout the entire program to ensure that this broad scope is achieved and threshold competencies are met (12). Focusing on the role of the existing forms for clinical practice in helping to

identify deficiencies and areas for improvement in the student's performance and/or skills, providing a check for the student's progress during clinical experiences, facilitating the student's self-evaluation of clinical performance, identifying areas of incompatibility in the evaluation and/or expectations between the practice education supervisor and the student, and guiding the decision of the practice education supervisors regarding the successful or unsuccessful status, we believe that this first study has provided new perspectives for future processes (25).

CONCLUSION

In this study, a clinical practice guideline was developed to track and evaluate the performance of final-year physiotherapy students on clinical practice courses. Students were assessed using the forms included in the guideline. The findings from the student report cards highlight the need to review the number of applications and observations in some rotation areas. However, we believe that more comprehensive new studies should be undertaken to identify deficiencies and areas for improvement.

DESCRIPTIONS

No financial support.

No conflict of interest.

REFERENCES

1. Jensen GM, Nordstrom T, Mostrom E, Hack LM, Gwyer J. National Study of Excellence and Innovation in Physical Therapist Education: Part 1—Design, Method, and Results. Phys Ther. 2017;97(9):857-74.

2. Solvang PK, Fougner M. Learning from clinical placement experience: how do undergraduate physiotherapy students approach person-centered practice? Physiotherapy Theory Pract. 2023;39(12):2609-24.

3. Cruz EB, Caeiro C, Pereira C. A narrative reasoning course to promote patient-centred practice in a physiotherapy undergraduate programme: a qualitative study of final year students. Physiother Theory Pract. 2014;30(4):254-60.

4. Ennion L, Hess D. Recommendations of behavioural facilitators for success in a physiotherapy clinical practice module: Successful students' perspectives. S Afr J Physiother. 2020;76(1):1392.

5. Australian Physiotherapy Association (APA). Future of physiotherapy in Australia: A 10-Year vision policy white paper. Camberwell, VIC: APA, 2022.

6. de Caro JX, Jalovcic D. Assuring quality mechanisms in physiotherapy education–The physiotherapist education framework. Fisioterapia. 2023;45:3-5.

7. Fizyoterapi ve Rehabilitasyon Çekirdek Eğitimi Programı (FTRCEP). Available from: https://www.yok.gov.tr/Documents/Kurumsal/egitim_ogretim_dairesi/Ulusal-cekirdek-egitimi-programlari/fizyotreapi_cekirdek_egitim_programi.pdf.

8. Lekkas P, Larsen T, Kumar S, Grimmer K, Nyland L, Chipchase L, et al. No model of clinical education for physiotherapy students is superior to another: a systematic review. Aust J Physiother. 2007;53(1):19-28.

9. Chesterton P, Chesterton J, Alexanders J. New graduate physiotherapists' perceived preparedness for clinical practice. A cross-sectional survey. Eur J Physiother. 2023;25(1):33-42.

10. Hayward LM, Black LL, Mostrom E, Jensen GM, Ritzline PD, Perkins J. The First Two Years of Practice: A longitudinal perspective on the learning and professional development of promising novice physical therapists. Phys Ther. 2013;93(3):369-83.

11. Wojkowski S, Norman KE, Stratford P, Mori B. Physiotherapy Students' Performance in Clinical Education: An Analysis of 1 Year of Canadian Cross-Sectional Data. Physiother Can. 2021;73(4):358-67.

12. World Physiotherapy (WP). Physiotherapist education framework. London, UK: World Physiotherapy; 2021.

13. de Almeida PMD. Innovation in physiotherapy education-guiding principles. Fisioterapia. 2023;45:7-9.

14. Deorukhkar S, Khatri SM, Kindblom K. Quality assurance system in Indian physiotherapy education: A missing link? Arch Med Health Sci. 2013;1(2):171-7.

15. Timmerberg JF, Chesbro SB, Jensen GM, Dole RL, Jette DU. Competency-based education and practice in physical therapy: it's time to act! Phys Ther. 2022;102(5).

16. Mills J-A, Middleton JW, Schafer A, Fitzpatrick S, Short S, Cieza A. Proposing a re-conceptualisation of competency framework terminology for health: a scoping review. Hum Resour Health. 2020;18(1):15.

17. Crawford BF, Borawski EA, Sinclair AL. Alignment of the Physical Therapist and Physical Therapist Assistant Clinical Performance Instrument Content to Current Practice Standards. Human Resources Research Organization; 2022.

18. Seidel A, Chang L, Greenberg A. Therapeutic modalities; 2021 [updated 2021; cited 2024 Jan 23]. Available from: https://now.aapmr.org/therapeutic-modalities/

19. Crawford BF, Sinclair AL. Physical therapist and physical therapist assistant clinical performance instruments: Validation Study. 2023.

20. American Physical Therapy Association (APTA). Using the APTA physical therapist clinical performance instrument for students: A self-guided training course; 2018.

21. Sinclair AL. Research studies to support reliability and validity of the PT CPI and PTA CPI. Human Resources Research Organization; 2020.

22. Wetherbee E, Dupre A-M, Feinn RS, Roush S. Relationship between narrative comments and ratings for entry-level performance on the clinical performance instrument: A call to rethink the clinical performance instrument. J Phys Ther Edu. 2018;32(4):333-43.

23. Sadler I, Reimann N, Sambell K. Feedforward practices: a systematic review of the literature. Assess Eval High Edu. 2023;48(3):305-20.

24. Lo K, Curtis H, Keating JL, Bearman M. Physiotherapy clinical educators' perceptions of student fitness to practise. BMC Med Edu. 2017;17(1):16.

25. Crawford BF, Sinclair AL. Intended Uses of the Physical Therapist and Physical Therapist Assistant Clinical Performance Instruments. Human Resources Research Organization; 2022.

26. Kennedy E, Bax J, Blanchard P, Drinkwater K, Dysart A, Horan K, et al. Clients and conditions encountered by final year physiotherapy students in private practice. A retrospective analysis. Physiotherapy Theory Practice. 2022;38(13):3027-36.

27. Alcan V. Fizyoterapi ve rehabilitasyon eğitiminde kanıta dayalı uygulama yaklaşımının sistematik olarak gözden geçirilmesi. Sağlık Bilimlerinde Eğitim Dergisi. 2021;3(1):13-23.

28. Candiri B, Burcu T. Fizyoterapi ve rehabilitasyon bölüm profilinin yıllara göre incelenmesi. International Journal of Social Humanities Sciences Research. 2023;10(91):96-101.

29. Korkmaz M, Çoban HO, Alkan H. Yükseköğretim kalite güvencesi sisteminde öğrenci memnuniyetinin değerlendirilmesi: Isparta Uygulamalı Bilimler Üniversitesi Orman Fakültesi Örneği. Bartın Orman Fakültesi Dergisi. 2023;25(3):479-91.

30. Roach KE, Frost JS, Francis NJ, Giles S, Nordrum JT, Delitto A. Validation of the revised physical therapist clinical performance instrument (PT CPI): Version 2006. Phys Ther. 2012;92(3):416-28.

31. Sevenhuysen SL, Haines T. The slave of duty: Why clinical educators across the continuum of care provide clinical education in physiotherapy. Hong Kong Physiother J. 2011;29(2):64-70.

32. Bearman M, Molloy E, Ajjawi R, Keating J. 'Is there a Plan B?': clinical educators supporting underperforming students in practice settings. Teach High Edu. 2013;18(5):531-44.

33. Sevenhuysen SL, Farlie MK, Keating JL, Haines TP, Molloy E. Physiotherapy students and clinical educators perceive several ways in which incorporating peer-assisted learning could improve clinical placements: a qualitative study. J Physiother. 2015;61(2):87-92.

34. Steenbruggen RA, Maas MJM, Hoogeboom TJ, Brand PLP, van der Wees PJ. A framework to improve quality of hospital-based physiotherapy: a design-based research study. BMC Health Serv Res. 2023;23(1):34.

35. Lombard E, Kerr G, Murphy N. The value of quality improvement training for physiotherapy in a large teaching hospital. Physiother. 2016;102(Suppl 1):e194.

36. Struessel TS, Sleddens NM, Jones KJ. Quality Improvement Content in Physical Therapist Education: A Scoping Review. Phys Ther. 2022;102(7):1-10.

Maternal Ambivalence and Related Factors: The Case of Şanlıurfa

(iD) **Fatma Koruk[1]**, (iD) **Zozan Duran Aysel[1]**

[1]Harran University Department of Obstetrics and Gynecology Nursing, Sanliurfa, Türkiye

ABSTRACT

Introduction: Maternal ambivalence refers to both positive and negative emotions associated with mothering. It is an essential factor that may affect maternal and infant health.

Objective: This study aimed to determine maternal ambivalence and related factors among women living in Şanlıurfa province.

Method: The population of this descriptive study consisted of pregnant women over 18 and mothers with children in the 0-2 age group. The sample size was calculated as 172 people according to the values obtained from the pilot study. The data were collected by face-to-face interviews between October and December 2024 using a personal information form, the Maternal Ambivalence Scale (MAS) and the Psychological Distress Scale (PDS). In evaluating the data, percentage, mean, and standard deviation from descriptive statistics, t-test, one way ANOVA test and Pearson Correlation analysis from univariate analysis were used.

Results: In the study, the mean age of the women was 26.3±5.4 years, and 60.4% had primary education or less. 20.9% of the women stated that they did not receive any spousal support during pregnancy, labour and postpartum periods. The mean MAS score was 29.8±0.2, and the mean PDS score was 38.7±0.4. Maternal ambivalence was higher in women without spousal support, and maternal ambivalence decreased as psychological distress increased (p<0.05).

Conclusion: As a result of this study, it was determined that women in Şanlıurfa have a moderate level of maternal ambivalence and that spousal support and psychological distress are factors affecting maternal ambivalence.

Keywords: Pregnant, Mother, Ambivalence, Psychological Distress, Spousal Support.

INTRODUCTION

Becoming a mother is a significant life goal for women (1). Although having a child is generally regarded as a situation that brings happiness and positive emotions, this experience does not always unfold as expected for mothers (1,2). This process, which starts with adding a new member to the family, is a challenging and stressful process that requires reorganisation of family dynamics because it brings new roles and responsibilities for the mother (3). Therefore, the decision to have a child may not always be easy for women of reproductive age (4). In this situation, both positive and negative emotions associated with being a mother coexist and are defined as "maternal ambivalence" (5). In its broader definition, maternal ambivalence is the mother's experience of mixed positive and negative emotions, thoughts and behaviours towards the maternal role or the baby (6). Maternal ambivalence can affect women in many ways. Studies show that when maternal ambivalence is not adequately addressed (ignored, suppressed, etc.), it may cause significant consequences on women's mental health (1,7). In particular, they may experience loss of self-esteem and self-confidence, body imagedissatisfaction, decreased quality of life, difficulties in social relationships, work life and leisure time utilization, and problems such as anhedonia, anger and stress (8,9).

In the literature, it is reported that there are many factors affecting maternal ambivalence. Some of these factors include partner presence and relationship quality (10), family and spouse support (11), influence of social environment (12), socio-economic status (13), mental health problems (14) and depression (1). Another important factor affecting maternal ambivalence is psychological distress (14). Psychological distress is defined as a state of emotional suffering characterized by symptoms of depression and anxiety (15). It is a factor that may negatively affect the mother-infant relationship and the cognitive and emotional development of the infant during pregnancy, delivery and postnatal period (16).

It is essential to identify maternal ambivalence and the factors affecting it early and develop solutions for them to protect and improve maternal-infant health. Şanlıurfa is a province with the highest fertility rate in Turkey (17), where women gain status with their fertility (18) and where individuals with different ethnic origins and cultures live together (19). Taking these factors into account, it is believed that research focusing on identifying the elements that influence mother-baby health, particularly maternal ambivalence and psychological distress, will significantly improve the field. Therefore, this study was conducted to determine women's maternal ambivalence and related factors in Şanlıurfa.

METHOD

Type of Study

The study is of descriptive type.

Place and Date of Conduct of the Study

The study was conducted between October 20 and December 7, 2024, in a training and research hospital in Şanlıurfa city centre.

Population and Sample of the Study

The study population consisted of pregnant women and mothers with at least one child aged 0-2 years who applied to the Obstetrics Outpatient Clinics and Postpartum Services of a training and research hospital in Şanlıurfa city centre for any reason. For the sample size, a pilot study was conducted with 53 women who applied to the hospital. From the data obtained as a result of the pilot study, the sample size was calculated considering the variable of planned pregnancy. Maternal ambivalence was 26.6 (±5.1) in unplanned and 24.55 (±3.67) in planned pregnancies and the typical standard deviation of both measurements was 3.36, and the effect size between the two groups was calculated as 0.61. However, to reduce the probability of error, the effect size was increased by 0.5. Accordingly, the total sample size was calculated as 172 people by taking the effect size 0.5, alpha error 0.05 and power 0.9.

Inclusion criteria;

- 18 years of age or older,

- Being pregnant or having at least one child aged 0-2 years,

- To know Turkish and not to have communication problems.

Data Collection Tools

The study's data were collected using the face-to-face interview technique through the Personal Information Form, which the researchers created (1,5,9,13,18). The form included questions about the participants' socio-demographic and obstetric characteristics, the Maternal Ambivalence Scale, and the Psychological Distress Scale. Each interview lasted approximately 10-15 minutes.

Personal Information Form: Participants' socio-demographic (age, education level, language spoken, employment status, economic status, spouse's education level, spouse's employment status, family type, place of residence, chronic disease status) and obstetric (age at marriage, duration of the marriage, order of pregnancy, gestational week, whether the pregnancy was planned or not, the total number of pregnancies, abortion experience, the reason for abortion, number of living children, gender of children, any disability in living children, health problems during pregnancy, type of termination of previous pregnancy, problems experienced in the last birth, previous birth experience, spousal support during pregnancy, birth and postpartum period) consisted of 27 questions.

Maternal Ambivalence Scale (MAS): The Turkish adaptation of the scale developed by Martín-Sánchez et al. (5) in 2022 was conducted by Ünal and Yağmur (13) in 2024. The scale is Likert-type and consists of 14 items in total. Each item on the scale is scored between 1 and 4 (1= Strongly disagree; 4= Strongly agree). Items 1,4,6,8,11,12, and 13 are reverse coded. The scale has three sub-dimensions: Doubts sub-dimension (2,3,5,7,9,10 items), Denial sub-dimension (1,4,6,8 items) and Suppression sub-dimension

(11,12,13,14 items). Higher scores in the sub-dimensions of the scale indicate more suspicion for the first sub-dimension, more insecurity for the second sub-dimension and more tendency to suppress ambivalence towards others for the third sub-dimension. The minimum score that can be obtained from the scale is 14, and the maximum score is 56. An increase in the total score obtained from the scale indicates a high level of maternal ambivalence. Cronbach's alpha coefficient of the scale was calculated as 0.752. In this study, the Cronbach alpha value of the scale was calculated as 0.618.

Psychological Distress Scale (PDS): The Turkish validity and reliability study of the scale developed by Kessler et al. (20) in 2002 was conducted by Altun et al. (21) in 2019. The lowest score that can be obtained from the five-point Likert scale is 10, the highest score is 50, and the scale consists of a total of 10 items. cut-off point of the scale is >20. Higher scores on the scale indicate more psychological distress. Cronbach's alpha coefficient of the scale was calculated as 0.95. In this study, the Cronbach's alpha value of the scale was calculated as 0.809.

Ethical Dimension of the Research

For the Maternal Ambivalence and Psychological Distress Scale used in the study, permission was obtained from the authors of the scale. Written permissions were obtained from the Harran University Clinical Research Ethics Committee (dated 22.07.2024 and numbered HRÜ/24.10.22) and Şanlıurfa Provincial Health Directorate (dated 01.10.2024 and numbered 375143), and informed consent was obtained from the participants. The Principles of the Declaration of Helsinki conducted each stage of the study.

Definitions

In the survey, the variable "the language spoken most at home" was asked to determine ethnic origin.

Variables of the Study

The dependent variable of the study is the mean scores of the participants on the Maternal Ambivalence Scale. The independent variables of the study were the participants' socio-demographic and obstetric characteristics and the mean scores of the Psychological Distress Scale.

Evaluation of Data

The data were evaluated with the statistical package program (SPSS 25.0). In the evaluation of the data, percentage, mean, and standard deviation from descriptive statistics, a T-test was used to compare the mean of two groups in categorical variables and a One way ANOVA test to compare the mean of three groups from univariate analysis; Pearson correlation analysis was used in continuous variables. The findings were interpreted at a significance level of $p < 0.05$ at 95% confidence interval.

RESULTS

The mean age of the women was 26.3±5.4 years. 54.6% of the women use a language other than Turkish at home (21.5% Kurdish, 33.1% Arabic). 60.4% of the women had primary education or less, and 48.3% lived in the city centre. 87.2% of the women were unemployed, and 42.4 % perceived their income level as low. The difference between the mean MAS scores of women and socio-demographic characteristics was not statistically significant (p>0.05) (Table 1).

80.2% of women had a planned pregnancy. 23.3% of women had a history of abortion (0.6% on demand and 22.7% for medical reasons), 4.7% had a history of having a disabled child, and 1.2% had a history of problems with previous births. 16.3% of mothers had a daughter, and 66.9% found their child's gender to align with their expectations. 16.3% of pregnant women experienced health problems during pregnancy. 20.9% of the women stated that they did not receive any spousal support during pregnancy, delivery and postpartum. While the difference between the groups was statistically significant (p<0.05) in terms of spousal support, it was not significant in terms of other obstetric characteristics (p>0.05). Accordingly, maternal ambivalence increased in women who did not have spousal support (Table 2).

Table 1. Distribution of Mean MAS Scores of Women According to Socio-Demographic Characteristics

Characteristics	n	%*	MAS Score Mean ±SD	Test	P value
Education Level					
Primary education and below	104	60.4	26.0±3.8		
Secondary education	48	27.9	26.7±4.3	1.932 **	0.148
University	20	11.6	27.8±4.4		
Most Spoken Language at Home					
Turkish	78	45.3	26.7±4.1		
Kurdish	37	21.5	25.9±4.2	0.519 **	0.596
Arabic	57	33.1	26.3±4.0		
Employment Status					
Yes	22	12.8	26.7±4.2		
No	150	87.2	26.3±4.0	0.378 ***	0.706
Perceived Economic Status					
High	10	5.8	25.5±4.3		
Medium	89	51.7	26.3±4.4	0.306 **	0.737
Low	73	42.4	26.5±3.5		
Spouse's Education Level					
Primary education and below	84	48.8	25.7±4.0		
Secondary education	59	34.3	26.7±4.0	2.369 **	0.097
University	29	16.8	27.5±4.0		
Spouse's Employment Status					
Yes	157	91.3	26.2±3.9		
No	15	8.7	27.8±5.1	-1.441 ***	0.151
Family Type					
Nuclear family	115	66.9	26.3±4.0		
Extended family	57	33.1	26.6±4.2	-0.401 ***	0.689
Place of Residence					
Provincal center	83	48.3	26.6±4.4		
District	63	36.6	26.3±3.5	0.210 **	0.811
Village	26	15.1	26.0±4.1		
Chronic Disease Status					
Yes	16	9.3	27.0±5.1		
No	156	90.7	26.3±3.9	0.596 ***	0.552
Total	172	100.0			

* Column Percentage, **Oneway ANOVA test, ***Independent samples test, MAS: Maternal Ambivalence Scale, SD:Standard Deviation.

Table 2. Distribution of Mean MAS Scores According to Obstetric Characteristics of Women

Characteristics	n	% *	MAS Score Mean ±SD	Test	P value
Planned/Willing Pregnancy Status					
Yes	138	80.2	26.3±4.0	-0.410 ***	0.682
No	34	19.8	26.6±4.2		
Abortion Experience					
Yes	40	23.3	26.9±4.1	0.983 ***	0.327
No	132	76.7	26.2±4.0		
Gender of Children**					
Girl	55	43.3	26.9±3.0	-0.234 ***	0.793
Boy	72	56.7	27.2±5.4		
Expectation Conformity of Child Gender**					
Yes	115	90.6	26.6±3.8	-0.146 ***	0.884
No	12	9.4	26.8±5.7		
Disabled Child**					
Yes	8	6.3	27.2±4.2	0.415 ***	0.679
No	119	93.7	26.6±4.0		
Health Problems in Pregnancy					
Yes	28	16.3	26.0±2.8	-0.591 ***	0.439
No	144	83.7	26.5±4.2		
Previous Problems in Childbirth**					
Yes	2	1.6	27.0±2.8	0.115 ***	0.908
No	125	98.4	26.6±4.1		
Spousal Support during Pregnancy, Childbirth and Postpartum					
Supporting	136	79.1	26.1±4.1	**-2.033*****	**0.044**
No support	36	20.9	27.6±3.6		
Total	172	100			

* Column Percentage, **This is the answer of those who answered the relevant question, ***Independent samples test, MAS: Maternal Ambivalence Scale, SD: Standard Deviation.

The mean age at marriage was 21.0± 3.9 years, the mean duration of marriage was 5.2±4.3 years, the mean number of pregnancies was 2.9±1.9, the mean number of living children was 1.9±1.6, the mean gestational order was 2.6±1.7 and mean gestational week was 35±3.8 weeks (Table 3).

Table 3. Distribution of Some Descriptive Characteristics of Women

Characteristics	Mean±SD	Median (min-max)
Age	26.3±5.4	25(17-49)
Marriage age	21.0± 3.9	20(15-38)
Duration of marriage	5.2±4.3	4.0(1-20)
Number of pregnancies	2.9±1.9	2.5(1-10)
Number of living children	1.9±1.6	2.0(0-8)
How many pregnancies	2.6±1.7	2.0(1-10)
Gestational week	35±3.8	36(10-41)

SD: Standard Deviation.

The mean MAS score of the women was 29.8±0.2, and it was 9.0±0.1 for the doubt subscale, 12±0.1 for the denial subscale and 8.7±0.1 for the suppression subscale. The mean PDS score was 38.7±0.4 (Table 4).

Table 4. Distribution of Women's Mean Scores on MAS and PDS

Mean Scale Score	Mean±SD	Median (min-max)
MAS	29.8±0.2	30(21-39)
Suspicions Subdimension	9.0±0.1	9(6-18)
Rejection Subdimension	12±0.1	12(7-16)
Suppression Subscale	8.7±0.1	9(6-11)
PDS	38.7±0.4	39(14-50)

SD: Standard Deviation, MAS: Maternal Ambivalence Scale, PDS: Psychological Distress Scale.

While there was a weak negative correlation between women's MAS scores and PDS scores (r:0.025, p<0.05), no significant correlation was found in terms of other socio-demographic and obstetric characteristics (p>0.05). Accordingly, as maternal ambivalence increases, psychological distress decreases (Table 5).

Table 5. Correlation of Women's MAS Scores with PDS Scores and Some Descriptive Characteristics

Variable	r value	p value
PDS Score	**-0.255**	**0.001**
Age	-0.084	0.276
Marriage age	0.043	0.580
Duration of marriage	-0.068	0.376
Pregnancy sequence	-0.047	0.623
Gestational week	-0.025	0.796
Number of pregnancies	-0.057	0.459
Number of living children	-0.022	0.771

PDS: Psychological Distress Scale.

DISCUSSION

This study, which investigated maternal ambivalence and related factors among women living in Şanlıurfa province, determined that women experienced a moderate level of maternal ambivalence (mean MAS score: 29.8±0.2). Similar results were obtained in international and national studies to determine maternal ambivalence in the literature. In these studies, the mean MAS score was reported as 26.48±6.71 in the study by Martín-Sánchez et al. (5), 27.81±5.07 in the study by Ünal et al. (13), and 23.04±6.96 in the study by Erbil et al. (22). Although the socio-demographic and cultural factors of the study population and the populations of these studies in the literature were different, similar results were obtained regarding maternal ambivalence, suggesting that the feeling of motherhood and maternal roles are universal and standard social dynamics are more effective.

The study found that spousal support during pregnancy, birth and postpartum periods was an essential factor in maternal ambivalence, and women who received support from their partners had lower maternal ambivalence. In the literature, it has been shown that women whom their partners support are mentally and physically healthier during pregnancy and the postpartum period (23,24). It has also been reported that women who receive partner support during pregnancy and delivery perceive the pregnancy

process as less stressful (25-27). In the study of Işık et al., it was stated that as perceived spousal support decreased, the level of postnatal trauma stress increased (28). Considering these findings, it is unsurprising that spousal support positively affected maternal ambivalence in our study.

In the study, it was found that socio-demographic and obstetric characteristics were not effective on maternal ambivalence. In Eastern culture, having a child is generally a status indicator for women (18). Therefore, motherhood is seen as an essential duty of women (29). Thus, cultural and social dynamics are more dominant than individual differences in fertility and motherhood. However, unlike our study, Ünal et al. (13) reported that socio-demographic (number of siblings, educational status, income status and spouse's educational status) and obstetric (number of pregnancies, number of children, age at marriage, perception of social support) characteristics of pregnant women were practical factors in maternal ambivalence. This difference may have resulted from the characteristics of the study population.

In the study, it was determined that there was a negative, albeit weak, relationship between women's maternal ambivalence and psychological distress. As mothers' psychological distress increases, their maternal ambivalence decreases. However, psychological distress is expected to increase maternal ambivalence. Although there is no study in the literature examining the relationship between maternal ambivalence and psychological distress, in a study examining the factors associated with pregnancy ambivalence, it was reported that the perceived stress levels and depressive symptoms of women experiencing ambivalence were higher (30). This situation, which was found to be different from the literature in the study findings, may have resulted from the fact that women could not clearly distinguish the symptoms related to maternal ambivalence and psychological distress or that they did not give clear answers to the questions related to maternal ambivalence for different reasons. Indeed, in the Button et al. study (31), it was emphasised that women did not always understand the symptoms of psychological distress or could not express how they felt even if they detected that something was wrong and that women were afraid of being seen as 'bad mothers' by society and stigmatised for not being able to cope with this situation and that this could lead to 'silencing themselves'.

Limitations of the study: Women may not have fully expressed their thoughts about motherhood ambivalence or psychological distress due to fear of being stigmatised as 'bad mothers'. Since there was no measurement tool or question to measure stigmatisation in the study, this may be a limitation of the study.

CONCLUSION

As a result of this study, it was determined that women in Şanlıurfa had a moderate level of maternal ambivalence and that spousal support and psychological distress were the factors affecting maternal ambivalence. In line with these results, it is recommended to increase psychological support and awareness-raising activities for women, to organize communication and parenting training to strengthen the supportive roles of spouses, to enhance psychological support mechanisms in health services and to develop social policies that support the parenting process.

DESCRIPTIONS

REFERENCES

1. Koletzko SH, La Marca-Ghaemmaghami P, Brandstätter V. Mixed expectations: Effects of goal ambivalence during pregnancy on maternal well-being, stress, and coping. Appl Psychol Health Well Being. 2015;7(3):249-274. doi:10.1111/aphw.12047

2. Kızılkaya Beji N, Murat M, Köse S. Perinatal dönem ruh sağlığı sorunları ve hemşirelik yaklaşımı. BSJ Health Sci. 2022;5(1):116-123. doi:10.19127/bshealthscience.897439

3. Kabukçuoğlu K. Kadın Sağlığı Sorunlarının Psikosomatik Yansımaları. 1st ed. İstanbul: Detay Yayıncılık; 2017.

4. Pinquart M, Stotzka C, Silbereisen RK. Personality and ambivalence in decisions about becoming parents. Soc Behav Personal. 2008;36(1):87-96.

5. Martín-Sánchez MB, Martínez-Borba V, Catalá P, et al. Development and psychometric properties of the maternal ambivalence scale in Spanish women. BMC Pregnancy Childbirth. 2022;22(1):625. doi:10.1186/s12884-022-04956-w

6. Papadima M. Barbara Almond, The Monster Within: The Hidden Side of Motherhood. Published 2012.

7. Henderson A, Harmon S, Newman H. The price mothers pay, even when they are not buying it: Mental health consequences of idealized motherhood. Sex Roles. 2016;74:512-526.

8. Rallis S, Skouteris H, McCabe M, Milgrom J. A prospective examination of depression, anxiety and stress throughout pregnancy. Women Birth. 2014;27(4):e36-e42. doi:10.1016/j.wombi.2014.08.002

9. Henderson A, Harmon S, Newman H. The price mothers pay, even when they are not buying it: Mental health consequences of idealised motherhood. Sex Roles. 2016;74:512-526.

10. Lozowchuk A, Carroll JE, Hobel C, et al. Partner relationship quality and IL-6:IL-10 trajectories from pregnancy to a year after birth. Brain Behav Immun. 2023;114:407-413. doi:10.1016/j.bbi.2023.09.007

11. MacLaughlin P, Scarbrough G. "I'm so tired": The labour of care, infant sleep management, and maternal ambivalence. The Maternal Tug: Ambivalence, Identity, and Agency. 2020;12.

12. Smith W, Turan JM, White K, et al. Social norms and stigma regarding unintended pregnancy and pregnancy decisions: A qualitative study of young women in Alabama. Perspect Sex Reprod Health. 2016;48(2):73-81. doi:10.1363/48e9016

13. Ünal E. Annelik Kararsızlığı Ölçeği'nin Türkçe'ye Uyarlaması ve Bazı Demografik-Obstetrik Değişkenler ile Depresyonun Annelik Kararsızlığı Üzerine Etkisi. [Doctoral dissertation]. İnönü Üniversitesi; 2024. Yükseköğretim Kurulu Ulusal Tez Merkezi. Thesis No. 853568.

14. Klann EM, Wong YJ. A pregnancy decision-making model: Psychological, relational, and cultural factors affecting unintended pregnancy. Psychol Women Q. 2020;44(2):170-186.

15. Drapeau A, Marchand A, Beaulieu-Prévost D. Epidemiology of psychological distress. Mental Illnesses-Understanding, Prediction and Control. 2012;69(2):105-106.

16. Barker ED, Kirkham N, Ng J, Jensen SK. Prenatal maternal depression symptoms and nutrition, and child cognitive function. Br J Psychiatry. 2013;203(6):417-421.

17. Türkiye İstatistik Kurumu. Adrese Dayalı Nüfus Kayıt Sistemi Sonuçları, 2024. Available at: https://data.tuik.gov.tr/Bulten/Index?p=Adrese-Dayali-Nufus-Kayit-Sistemi-Sonuclari-2024-53783 (Access date:10.01.2025)

18. Koruk F, Eroğlu K, Koruk İ, Çelik K, Güner P. Married men's perspectives and reproductive behaviors on fertility in the province with the highest fertility rate in Turkey: A mixed-method study. Nobel Medicus. 2022;18(2):89-98.

19. Avcı N, Şirin F. Farklı etnik kimlik tanımlamalarında bulunan grupların toplumsal bütünleşme ve farklılaşma alanları. [Doctoral dissertation]. Cihad ÖZSÖZ; 2020.

20. Kessler RC, Andrews G, Colpe LJ, et al. Short screening scales to monitor population prevalences and trends in non-specific psychological distress. Psychol Med. 2002;32(6):959-976. doi:10.1017/S0033291702006074

21. Altun Y, Ozen M, Kuloglu MM. Turkish adaptation of Kessler psychological distress scale: Validity and reliability study. Anadolu Psikiyatri Dergisi. 2019;20(Supplement 1):23-31. doi:10.5455/APD.12801

22. Erbil N, Boyraz Yanık HG. Validity and reliability of the Turkish version of the maternal ambivalence scale. Int J Nurs Pract. 2025;31(1):E13319. doi:10.1111/ijn.13319

23. Lozowchuk A, Carroll JE, Hobel C, et al. Partner relationship quality and IL-6:IL-10 trajectories from pregnancy to a year after birth. Brain Behav Immun. 2023;114:407-413. doi:10.1016/j.bbi.2023.09.007

24. Bernard O, Gibson RC, McCaw-Binns A, et al. Antenatal depressive symptoms in Jamaica associated with limited perceived partner and other social support: A cross-sectional study. PLoS One. 2018;13(3):e0194338.

25. Sokoya MR, Farotimi AR, Ojewole F. Women's perception of husbands' support during pregnancy, labour, and delivery. IOSR J Nurs Health Sci. 2014;3:45-50.

26. Doğrul E, Alan Dikmen H. Gebelerde eş desteğinin annelik rolü, beden algısı ve distres düzeyi ile ilişkisi: Tanımlayıcı bir çalışma. Selçuk Sağlık Derg. 2023;4(2):163-175.

27. Yanılmaz P, Beydağ KD. Primipar Gebelerin Doğum Öncesi Algıladıkları Stres ve Eş Desteği Arasındaki İlişkinin Belirlenmesi. Sağlık Toplumu. 2023;33(2):87-94.

28. Işık M, Demirgöz Bal M. Doğum Sonrası Dönemde Eş Desteğinin Travma Sonrası Stres Belirti Düzeyine Etkisi. J Sağlık Bilimleri Müdürü 2022;2(2):27-32.

29. Kılıçgün MY, Kılıçkaya A. Geleneksel annelik ölçeği'nin psikometrik özellikleri: Geçerlik ve güvenilirlik çalışması. İnsan ve Toplum Bilimleri Araştırmaları Dergisi. 2016;5(8):2867-2881.

30. Bahadır Yılmaz E, Şahin E. Gebelerin prenatal sıkıntı düzeyleri ile ilişkili faktörler. Psikiyatri Hemşireliği Dergisi. 2019;10(3):197-203.

31. Button S, Thornton A, Lee S, Shakespeare J, Ayers S. Seeking help for perinatal psychological distress: A meta-synthesis of women's experiences. Br J Gen Pract. 2017;67(663):e692-e699. doi:10.3399/bjgp17X692549

Nurses' Caring Behaviour And Identification Of Influencing Factors: The Case Of A Public Hospital

[ID] **Dilek Sakallı[1]**, [ID] **Suzan Havlioğlu[2]**, [ID] **Arife Özen[3]**

[1]Harran University, Faculty of Health Sciences, Department of Nursing Management, Şanlıurfa, Türkiye
[2]Harran University, Faculty of Health Sciences, Department of Public Health Nursing, Şanlıurfa, Türkiye
[3]Şanlıurfa Mehmet Akif İnan Training and Research Hospital, Şanlıurfa, Türkiye

ABSTRACT

Introduction: Caring behavior aims to provide care in accordance with the needs of patients by taking an approach to improve their health status and is a concept directly related to the performance of nurses. The fact that patients' health outcomes are related to nurses' caring behaviors shows that it is imperative to focus on care in nursing practice.

Objective: The study was conducted to determine nurses' perceptions of quality of care and the factors affecting these perceptions.

Method: It is a descriptive study. It was conducted with nurses working in a public hospital between February 10 and February 20, 2025. There were 279 nurses in the sample of the study. Data were collected using the Socio-demographic Information Form and the Caring Behaviors Inventory-24 form. Descriptive statistics, t-test, one-way variance test (ANOVA) and Kruskal Wallis analysis were applied to analyze the data.

Results: The mean total score and sub-dimension total scores of the "Caring Behaviors Inventory-24" of the nurses participating in the study were as follows: Assurance sub-dimension mean score 5.30±0.68, Knowledge-Skill sub-dimension mean score 5.55±0.64, Respectfulness sub-dimension mean score 5.28±0.73, Commitment sub-dimension mean score 5.15±0.81, and scale total mean score 5.32±0.66, respectively. In the study, a statistically significant difference was found between the total score of the nursing behaviors scale and professional experience, liking the nursing profession, average weekly working hours, the time allocated to patient care in the 8-hour shift, finding the nursing care provided in the unit where they worked adequate and satisfaction with the nursing care provided (p<0.05).

Conclusion: It was found that nurses' perceptions of quality of care were higher, nurses with 11 years or more of professional experience, those who love the nursing profession, those with an average weekly working time of 40 hours, those who spent two hours or more on patient care in an eight-hour shift, those who found nursing care adequate in the unit where they worked, and those who were satisfied with the nursing care provided had higher total scores on the care behaviors scale. In line with these results, it is recommended to organize trainings that will strengthen nurses' bonding with the patient, empathy, and support for the patient and to create positive working environments in order to increase the quality of care.

Keywords: Nurse, Care, Care Behavior, Quality of Care.

INTRODUCTION

Watson defines caring as the moral aspect and heart of nursing and considers it to be the foundation of professional nursing (1). According to Watson, nursing is defined as an ethical, scientific and interpersonal process of interaction with the harmony of mind, spirit and body (2,3). Care includes aspects such as informing the patient about the procedures being applied to the patient, individualising, providing support, meeting unmet needs, helping the individual to cope, and these practices constitute the art aspect of nursing (4). The literature recommends that the caring aspects of nursing should be considered alongside the technical aspects of care and that both aspects of care should be provided together (5,6). Caring behaviour aims to provide care that meets the needs of patients by demonstrating an approach to improving their health status and is a concept directly related to nurses' performance (7). Caring behaviours refer to actions that support the person's wellbeing, such as skills, knowledge, effective communication, critical thinking, careful listening and acceptance without judgement (8,9). In the study by Taylor et al (10), the fact that patient health outcomes are related to nurses' caring behaviours demonstrates the need to focus on caring in nursing practice (11).

It has been reported that the patient-nurse caring relationship is influenced by situations such as expectations, knowledge, skills, values, communication and environment (5,6). Many factors such as personal characteristics such as age and experience, job satisfaction, lack of resources and time, workload, communication, shift work and mental health have been reported to influence nurses' caring behaviour (9,12-15). Nursing is a distinct field of the nursing profession and the quality of nursing is the basis for the success of the profession (16). Nurses focus on quality care to maximise the quality of life of patients (17).

As nurses have a high level of interaction with patients and families, their caring behaviours are important in providing treatment and psychological comfort. It is emphasised that nurses' caring behaviours are important indicators of service quality and influence patient satisfaction, quality of care and hospital readmissions (18). Therefore, the aim of this study was to determine nurses' perceptions of quality of care and the factors influencing these perceptions.

METHOD

Type of Research

The study used a descriptive design to determine the extent to which nurses perceived the quality of care.

Study Population and Sample

The study population consisted of 836 nurses working in a public hospital. The minimum number of samples to be achieved was calculated as 264 by calculating the known sample. The study was completed with 279 nurses who volunteered to participate.

Inclusion criteria:

Nurses who had worked in a public hospital for at least six months and who volunteered to participate in the study were included in the study.

Data Collection Tools

The Sociodemographic Information Form and the Care Behaviour Scale-24 were used to collect data.

Socio-demographic Information Form

The form contains a total of 15 questions, including questions on demographic information such as age, gender, education, marital status, family status and length of employment, as well as questions on the nursing profession and working conditions.

Caring Behaviors Inventory-24

The scale was developed by Wolf (19) in 1981 and consisted of 75 items. It was revised in 1994 and reduced to 42 items. The scale can be used bidirectionally by nurses and patients. In 2006, the number of items was reduced to 24 by Wu et al. (20) and reorganised into 4 sub-dimensions as knowledge-skills, assurance, commitment and respectfulness The scale was designed as a 6-point Likert scale to assess the nursing process. The Turkish validity and reliability of the scale was conducted by Kurşun and Kanan (2012). For the scale and its sub-dimensions, the scores of the items are summed and then the obtained score is divided by the number of items to obtain a sub-dimension score between 1 and 6 points. In the Turkish validity and reliability study of the scale, the Cronbach's alpha value was reported to be 0.96 (17). In this study, Cronbach's alpha was found to be 0.96.

Variables of the Study

The dependent variable of the study was the mean score of the caring behaviours scale. The independent variables of the study were age, gender, educational status, marital status, working hours, service, liking the nursing profession, willing to choose the nursing profession, working style, working hours, satisfaction with the care provided, finding the care provided adequate, number of patients cared for and duration of care provided.

Data Collection

Ethics committee and institutional approval was obtained from the institution where the research was to be conducted. The link to the online survey was then sent to the nurses. Before completing the data collection tools, the nurses were informed about the research in the first part of the online survey link and were asked to tick the I agree to participate box if they agreed to participate in the research. Nurses were informed that they could withdraw from the study at any time and that participation was voluntary. The consent and forms received by the researchers were digitally recorded. Nurses who completed the form online were considered to have agreed to participate in the study. Confidentiality of form responses was ensured and only the email account provided to the researchers and Google forms were displayed. The average time taken to complete the questionnaire was between 5-10 minutes. Data were collected between 10 and 20 February 2025.

Analysis of Data

SPSS 25.00 was used to analyse the data. The Shapiro-Wilk test, histogram, skewness and kurtosis coefficients were used to assess the adherence to normal distribution. Descriptive statistics (number, percentage, mean), independent samples t-test and one-way analysis of variance (ANOVA) were used for those conforming to normal distribution and Kruskal-Wallis analysis for those not conforming to normal distribution. In statistical decisions, $p < 0.05$ was accepted as an indicator of significant difference.

Ethical Aspects of the Study

Approval was obtained from the Ethics Committee of a university (decision dated 10.02.2025, meeting number 03 and number 01), the Education Planning Committee of the hospital where the study would be conducted, the individuals who would participate in the study and the authors of the scale. The study was conducted in accordance with the tenets of the Declaration of Helsinki.

RESULTS

Of the nurses who participated in the study, 52.3% were between 31 and 50 years old, 56.3% were female, 76.3% were married, 80.3% had a bachelor's degree, 36.9% had worked in nursing for 6-10 years, 51.6% had worked in the same institution for 1-5 years, 33.3% worked in units other than surgical, medical, emergency, intensive care, 41. 2% enjoyed the nursing profession, 71%, 7% chose the nursing profession by choice, 59.4% worked alternate days and nights, 57% worked 41 hours or more per week, 62.7% were satisfied with the care provided, 50.9% found the care provided in the unit where they worked sufficient, and 38.4% spent 2 hours or more caring for patients in an eight-hour working period (Table 1).

The mean total and sub-dimension total scores of the Caring Behaviours Scale-24 of the nurses participating in the study were 5.30±0.68, 5.55±0.64, 5.28±0.73, 5.15±0.81 and 5.32±0.66, respectively (Table 2).

In the study, there was a statistically significant difference between the total score of the nursing behaviours scale and professional experience, liking the nursing profession, average weekly working hours, time spent on patient care in an 8-hour shift, finding the nursing care provided in the unit where they worked sufficient and satisfaction with the nursing care provided ($p < 0.05$). Accordingly, it was found that nurses with 11 or more years of experience, those who like the nursing profession, those who work an average of 40 hours per week, those who spend 2 or more hours on patient care in an 8-hour shift, those who find the nursing care provided in the unit where they work adequate and those who are satisfied with the nursing care provided have higher total scores on the nursing behaviours scale (Table 3).

Table 1. Sociodemographic Characteristics of Nurses

Sociodemographic characteristics		Number	Percent
Age	23-30	133	47.7
	31-50	146	52.3
Gender	Woman	157	56.3
	Male	122	43.7
Marital Status	Married	213	76.3
	Single	66	23.7
Education Status	Pre-Licence	36	12.9
	Licence	224	80.3
	Postgraduate	19	6.8
Work Experience	6-11 months	14	5.0
	1-5 years	78	28.0
	6-10 years	103	36.9
	11-20 years	64	22.9
	Over 21 years	20	7.2
Duration of the employment relationship with the organisation	6-11 months	48	17.2
	1-5 years	144	51.6
	6-10 years	56	20.1
	11-20 years	26	9.3
	Over 21 years	5	1.8
The unit you work in	Internal services	38	13.6
	Surgical wards	50	17.9
	Emergency Services	22	7.9
	Intensive care	76	27.2
	Other	93	33.3
Loving the nursing profession	Yes	115	41.2
	Partially	52	18.6
	No	112	40.1
Nursing career choice voluntarily	Yes	200	71.7
	No	79	28.3
How you work	Constantly at night	113	40.6
	Alternating day and night	165	59.4
Your average weekly working hours	40 hours	120	43.0
	41 hours and over	159	57.0
Satisfaction with the nursing care provided	Yes	175	62.7
	Partially	86	30.8
	No	18	6.5
Finding the nursing care provided in the unit where she/he works adequate	Yes	142	50.9
	Partially	113	40.5
	No	24	8.6
In an 8-hour shift, how much time do you spend on patient care?	15-30 min	59	21.1
	31min-1 hour	46	16.5
	1-2 hours	67	24.0
	2 hours and above	107	38.4

Table 2. Distribution of nurses' scores on the Caring Behaviors Inventory-24 (n=279)

	Min	Maks	Mean	Standard Deviation
Assurance	2.88	6.00	5.30	0.68
Knowledge and skill	1.00	6.00	5.55	0.64
Respectfulness	1.00	6.00	5.28	0.73
Connectedness	1.00	6.00	5.15	0.81
Caring behaviour inventory total score	1.88	6.00	5.32	0.66

Min: Minimum, Max: Maximum, n: Number.

Table 3. Comparison of nurses' socio-demographic characteristics and mean Caring Behaviors Inventory-24

Socio-demographic Characteristics	Assurance	Knowledge and skill	Respectfulness	Connectedness	Caring behaviour inventory total score
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Age					
23-30	5.22±0.75	5.48±0.63	5.23±0.71	5.12±0.78	5.26±0.68
31-50	5.38±0.60	5.65±0.52	5.35±0.66	5.20±0.76	5.39±0.59
p	0.067	**0.015**	0.156	0.428	0.088
Gender					
Woman	5.34±0.66	5.61±0.53	5.36±0.63	5.26±0.70	5.39±0.59
Male	5.26±0.70	5.52±0.64	5.20±0.74	5.04±0.84	5.26±0.68
p	0.354	0.206	0.056	**0.020**	0.094
Marital Status					
Married	5.31±0.70	5.56±0.62	5.30±0.71	5.18±0.78	5.33±0.66
Single	5.29±0.60	5.62±0.43	5.28±0.59	5.12±0.73	5.32±0.52
p	0.842	0.448	0.886	0.623	0.929
Education Status					
Pre-Licence	5.51±0.74	5.71±0.59	5.48±0.73	5.39±0.76	5.52±0.67
Undergraduate and postgraduate	5.28±0.66	5.55±0.58	5.27±0.68	5.13±0.77	5.30±0.62
p	0.058	0.136	0.085	0.064	0.058
Work Experience					
6 months -5 years	5.23±0.69	5.47±0.59	5.23±0.67	5.12±0.78	5.26±0.64
6-10 years	5.25±0.73	5.55±0.64	5.24±0.76	5.09±0.83	5.27±0.70
11 years and over	5.47±0.56	5.71±0.46	5.43±0.57	5.30±0.68	5.48±0.52
p	**0.031** (1-3)(2-3)	**0.027** (1-3)	0.081	0.129	**0.0398** (1-3)(2-3)
Loving the nursing profession					
Yes	5.41±0.64	5.64±0.53	5.40±0.65	5.26±0.73	5.42±0.59
Partially	5.19±0.69	5.47±0.64	5.14±0.72	5.01±0.81	5.40±0.62
No	5.35±0.70	5.64±0.54	5.39±0.65	5.28±0.73	5.20±0.66
p	0.051	0.054	**0.011** (1-2)(2-3)	**0.023** (1-2)(2-3)	**0.018** (1-2)
Nursing career choice voluntarily					
Yes	5.36±0.65	5.57±0.59	5.32±0.68	5.19±0.77	5.36±0.63
No	5.17±0.73	5.57±0.56	5.22±0.69	5.09±0.76	5.25±0.64
p	**0.032**	0.978	0.272	0.301	0.185
How you work					
Constantly at night	5.39±0.66	5.62±0.57	5.39±0.64	5.25±0.72	5.41±0.60
Alternating day and night	5.25±0.69	5.54±0.59	5.23±0.71	5.10±0.80	5.17±0.65
p	0.107	0.221	0.051	0.129	0.085
Your average weekly working hours					
40 hours	5.42±0.63	5.69±0.51	5.47±0.61	5.36±0.68	5.47±0.57
41 hours and over	5.23±0.70	5.48±0.62	5.16±0.71	5.01±0.80	5.22±0.66
p	**0.020**	**0.004**	**0.001**	**0.001**	**0.001**
In an 8-hour shift, how much time do you spend on patient care?					
15-30 min	5.14±0.73	5.50±0.67	5.11±0.81	4.95±0.95	5.16±0.72
31min-1 hour	5.22±0.53	5.51±0.43	5.16±0.50	4.99±0.58	5.22±0.47
1-2 hours	5.29±0.76	5.54±0.63	5.30±0.72	5.16±0.81	5.32±0.69
2 hours and above	5.45±0.63	5.66±0.55	5.45±0.62	5.36±0.66	5.48±0.58
p	**0.023**	0.276	**0.008**	**0.003**	**0.011**
	Median ±SD	Median ±SD	Median ±SD	Median ±SD	Median ±SD
Is the nursing care provided in the unit where you work adequate?					
Yes	5.75±0.62	6.00±0.54	5.66±0.64	5.60±0.68	5.75±0.58
Partially	5.12±0.66	5.60±0.67	5.16±0.67	5.00±0.76	5.20±0.62
No	5.00±0.82	5.60±0.66	5.08±0.80	5.00±0.97	5.08±0.76
p	**0.001** (1-2)(1-3)	**0.001** (1-2)(1-3)	**0.001** (1-2)(1-3)	**0.001** (1-2)(1-3)	**0.001** (1-2)(1-3)
Are you satisfied with the nursing care you receive?					
Yes	5.75±0.62	6.00±0.55	5.66±0.62	5.40±0.67	5.66±0.58
Partially	5.06±0.64	5.60±0.69	5.16±0.69	5.00±0.81	5.12±0.62
No	4.93±0.84	5.60±0.58	5.00±0.85	4.80±0.93	5.06±0.78
p	**0.001** (1-2)(1-3)	**0.001** (1-2)(1-3)	**0.001** (1-2)(1-3)	**0.001** (1-2)(1-3)	**0.001** (1-2)(1-3)

Min: Minimum, Max: Maximum, SD: Standard Deviation.

DISCUSSION

The study was conducted to determine nurses' perceptions of the quality of nursing care and the factors influencing these perceptions. When the calculation of the Care Behaviours Scale-24 used in the study was examined, it was reported that the total scale score ranged from 1 to 6 and as the total scale score increased, the level of nurses' perception of quality of care increased (17). In the study, the total scale score was found to be 5.32. Accordingly, it can be said that the nurses participating in this study have a high perception of quality of care. In the literature, similar to this study, there are studies reporting that nurses' perceptions of caring behaviours are high (12,16,21-33) and moderate (34-37). In addition, the highest score was found in the knowledge-skills sub-dimension and the lowest score was found in the commitment sub-dimension. This finding is similar to the literature (16,21,27).

Nurses' high perceptions of quality of care indicate that nurses are aware of and sensitive to the care that is their primary responsibility. The high score for the knowledge-skills sub-dimension indicates that nurses use their professional knowledge and skills more effectively, particularly in medical procedures and patient care, and that they emphasise the technical aspects of professional care. The low scores for the commitment sub-dimension suggest that nurses find it difficult to get closer to their patients and spend more time with them. This finding may indicate that nurses sometimes experience deficits in the human aspects of care. The inability of nurses to devote sufficient time to these aspects may be due to heavy workloads, stress and institutional barriers. The results of the study show that nurses are strong in the technical aspects of care, but there are areas for improvement in terms of interaction with patients and engagement. The literature emphasises that the caring aspects of nursing should be considered together with the technical aspects of care and that both aspects of care should be provided together (5,6). In order to improve the quality of care provided by nurses, it is suggested that not only their professional skills but also their relationships with patients should be strengthened.

The study found that nurses who had worked for 11 years or more had higher perceptions of quality of care. Similarly, there are studies in the literature reporting that experienced nurses have higher perceptions of quality of care (16,35). In contrast to this finding, there are also studies reporting that there is no relationship between nurses' years of experience and their perceptions of quality of care (22,29). The results of the study showed that work experience had a positive effect on the quality of care, and that nurses became more aware and competent in providing quality care as they gained experience. It is thought that nurses develop more effective communication skills, identify patients' needs more accurately and quickly, and that these processes enhance their perceptions of quality of care.

The study found that nurses who liked their job had higher perceptions of quality of care. It has been reported in the literature that those who willingly choose the nursing profession have good levels of caring behaviour (27), that doing their job willingly increases their perceptions of quality of care (26), that nurses' job commitment and job satisfaction positively influence their caring behaviour (38), and that nurses' job satisfaction influences their perceptions of caring behaviour (30). The results of the study show that nurses' interest in their work has an impact on the quality of care. It also shows that nurses' love and commitment to their profession are important factors that increase their perception of quality of care and the quality of care they provide. It was suggested that increased professional satisfaction of nurses improved their interactions with patients, empathy, perceptions of quality of care and care behaviours.

The study found that nurses' perceptions of quality of care decreased as average weekly working hours increased. Similarly, there are studies in the literature (33,39) reporting that nurses' caring behaviours deteriorate with increases in daily working hours. It is thought that long working hours can cause nurses to experience negative conditions such as stress, fatigue and burnout, limiting their energy, attention and interactions with patients and negatively affecting their care processes. This finding from the study shows that a balance between nursing workload and working hours is important for nurses to provide effective, high quality care.

The study found that nurses who spent two hours or more on patient care in their eight-hour shift had higher perceptions of quality of care. It was suggested that the increase in time spent on patient care allowed nurses to better understand the needs of their patients. When nurses spend more time caring for

patients, it is easier for them to establish a strong patient-nurse interaction and provide careful care, and it improves the quality of care by allowing nurses to focus more on the processes of care.

It was found that nurses who perceived the care provided in the unit where they worked to be adequate and who were satisfied with the care provided in their unit had higher perceptions of quality of care. Similarly, scores on the commitment sub-dimension (40) and caring behaviours were higher in nurses who were satisfied with the care provided in the studies (41,42). This finding shows that nurses' perceptions of quality of care are influenced not only by their knowledge, skills and experience, but also by the conditions of their working environment and the quality of the service provided. It is suggested that improving not only the individual dimension but also the working environment can increase nurses' satisfaction with care and their perceptions of care quality.

The study found that nurses' age, gender, marital status, educational status, choice of nursing profession and work style did not affect the total score on the caring behaviours scale. Similarly, there are studies in the literature (12,16,22,29,43) that report that gender, age and educational level do not influence nurses' caring behaviours. In addition to these findings, the literature also reported that nurses with an associate's degree had higher perceptions of quality of care than those with a bachelor's degree (27), that higher levels of education were associated with caring behaviours (14,30), that caring behaviour scores increased with age (31,35), and that nurses who worked full-time during the day had higher caring behaviour scores (31). These different findings suggest that the factors influencing perceptions of quality of care and care behaviours are multidimensional and that it would not be sufficient to assess the effect of quality of care using only one variable. Studies showing that demographic factors do not influence care behaviours suggest that situations such as working conditions, institutional factors and personal motivations may also be at play.

Limitations of the Study

This study was limited to nurses working in a public hospital. The results of the research cannot be generalised to society, the results are valid for the defined sample.

CONCLUSIONS

This study shows that nurses have high perceptions of quality of care and that there are several factors that influence these perceptions. It was found that the nurses' professional experience, the fact that they love the nursing profession, the time they devote to patient care, the working hours and the quality of the service provided are the factors that influence the level of perception of quality of care. Nurses were found to be strong in technical aspects of care such as knowledge and skills, but there were areas for improvement in areas such as patient engagement and interaction. It was noted that long working hours and excessive workload can negatively affect nurses' perceptions of quality of care. The results of the study showed that in order to improve the quality of care provided by nurses, not only their professional skills but also their relationships with patients should be strengthened. It was concluded that demographic factors alone were not sufficient to explain quality of care. In line with these findings, it is recommended that training is organised to enhance nurses' ability to relate to, empathise with and support patients and to create a positive working environment to improve the quality of care. In addition, it will be important to improve work organisation, work schedules and workload balance to reduce the negative effects of long working hours and high workload.

DESCRIPTIONS

No financial support.

No conflict of interest.

REFERENCES

1. Watson J, Brewer B. Caring science research: criteria, evidence, and measurement. JONA: The Journal of Nursing Administration. 2015;45(5):235-236. doi:10.1097/NNA.0000000000000190

2. Watson J. Unitary caring science: The philosophy and praxis of nursing. Louisville, CO: University Press of Colorado; 2018.

3. Kol E, Boz İ. A literature review on caregiving behaviors in intensive care nursing. Intensive Care Nursing Journal. 2020;24(1):32-38.

4. Birol L. Nursing process (8th ed.). İzmir: Etki Matbaacılık Yayıncılık Ltd. Şti; 2007.

5. Wiechula R, Conroy T, Kitson AL, Marshall RJ, Whitaker N, Rasmussen P. Umbrella review of the evidence: What factors influence the caring relationship between a nurse and patient? Journal of Advanced Nursing. 2016;72(4):723-734. doi:10.1111/jan.12862.

6. Mutlu BF. The investigation of the relationship between workload perception and caregiving behaviors in intensive care nurses [master's thesis]. Izmir Kadir Çelebi University Institute of Health Sciences; 2023.

7. Aupia A, Lee TT, Liu CY, Wu SFV, Mills ME. Caring behavior perceived by nurses, patients and nursing students in Indonesia. Journal of Professional Nursing. 2018;34(4):314-319. doi:10.1016/j.profnurs.2017.11.013.

8. Papastavrou E, Efstathiou G, Charalambous A. Nurses' and patients' perceptions of caring behaviours: Quantitative systematic review of comparative studies. Journal of Advanced Nursing. 2011;67(6):1191-1205. doi:10.1111/j.1365-2648.2010.05580.x.

9. Salimi S, Azimpour A. Determinants of Nurses' Caring Behaviors (DNCB): Preliminary validation of a scale. Journal of Caring Sciences. 2013;2(4):269-278. doi:10.5681/jcs.2013.032.

10. Taylor R, Thomas-Gregory A, Hofmeyer A. Teaching empathy and resilience to undergraduate nursing students: A call to action in the context of Covid-19. Nurse Educ Today. 2020;94:104524.

11. Mårtensson S, Knutsson S, Hodges EA, Sherwood G, Broström A, Björk M. Development of caring behaviour in undergraduate nursing students participating in a caring behaviour course. Scandinavian Journal of Caring Sciences. 2024;38(1):47-56.

12. Erol F, Turk G. Assessing the caring behaviours and occupational professional attitudes of nurses. The Journal of the Pakistan Medical Association. 2019;69(6):783-787.

13. Oluma A, Abadiga M. Caring behavior and associated factors among nurses working in Jimma University specialized hospital, Oromia, Southwest Ethiopia, 2019. BMC Nurs. 2020;19:19. doi:10.1186/s12912-020-0407-2.

14. Taylan S, Özkan O, Şahin G. Caring behaviors, moral sensitivity, and emotional intelligence in intensive care nurses: A descriptive study. Perspect Psychiatr Care. 2021;57:734-746. doi:10.1111/ppc.12608.

15. Kibret H, Tadesse B, Debella A, Degefa M, Regassa LD. Level and predictors of nurse caring behaviors among nurses serving in inpatient departments in public hospitals in Harari region, eastern Ethiopia. BMC Nurs. 2022;21:76. doi:10.1186/s12912-022-00856-8.

16. Çolak Okumuş D, Uğur E. The effect of nurses' emotional intelligence levels on caregiving behaviors. Acıbadem University Journal of Health Sciences. 2017;8(2):104-109.

17. Kurşun Ş, Kanan N. Validity and reliability study of the Turkish version of the Caregiving Behaviors Scale-24. Anadolu Journal of Nursing and Health Sciences. 2012;15(4):229-235.

18. Hajinezhad ME, Haghani H, Rafii F. Nurse caring in Iran and its relationship with patient satisfaction. Aust J Adv Nurs. 2008;26:75-84. doi:10.37464/2009.262.1781.

19. Wolf ZR, Giardino ER, Osborne PA, Ambrose MS. Dimensions of nurse caring. Image J Nurs Sch. 1994;26(2):107-111.

20. Wu Y, Larrabee JH, Putman HP. Caring behaviors inventory: A reduction of the 42-item instrument. Nursing Research. 2006;55(1):18-25.

21. Yürün Y, Yıldırım A. Determining the patient caregiving behaviors of nurses working in hospitals. [master's thesis]. Near East University Institute of Health Sciences, TRNC; 2015.

22. Erenoğlu R, Can R, Tambağ H. Nursing caregiving behaviors and factors related to caregiving behaviors: A maternity hospital example. Health and Society. 2019;29(1):79-88.

23. Gürkan A, Dikmen Aydın Y, Aldemir K. Surgical patients' perceptions of nursing care quality and their satisfaction with nursing care. Turkish Clinics Journal of Nursing Sciences. 2020;12(3):329-336.

24. Mert Boğa S, Aydin Sayilan A, Kersu Ö, Baydem C. Perception of care quality and ethical sensitivity in surgical nurses. Nursing Ethics. 2020;27(3):673-685. doi:10.1177/0969733020901830.

25. Bulut S, Kızılırmak H. Examining the relationship between professional values and caregiving behaviors of nurses working in the COVID-19 intensive care unit. İnönü University Journal of Health Services Vocational School. 2022;10(1):241-254.

26. Dığın F, Özkan ZK, Şahin AD. Determining the relationship between compassion fatigue and caregiving behaviors of surgical nurses. Online Turkish Journal of Health Sciences. 2022;7(2):272-277.

27. Efil S, Turen S, Ayvaz MY, Bulbul E, Yeni T. Burnout levels and care behaviors in intensive care nurses: A cross-sectional, multicenter study. Intensive and Critical Care Nursing. 2022;71:103246.

28. Gülfidan H. The effect of moral distress levels of surgical nurses on nursing caregiving behaviors and related factors. [master's thesis]. Aydın Adnan Menderes University Institute of Health Sciences; 2022.

29. Demirağ H, Coşar DA. The relationship between moral injury symptoms and nursing caregiving behaviors in internal medicine nurses. Gümüşhane University Journal of Health Sciences. 2023;12(3):1182-1192.

30. Kurtgöz A, Edis EK. The relationship between nurses' personality traits and caregiving behaviors and spiritual care competencies. Gümüşhane University Journal of Health Sciences. 2024;13(3):1286-1294.

31. Sert H, Gulbahar Eren M, Ucgul K. Occupational fatigue, compassion competence, and caring behaviors of intensive care nurses: A structural equation modeling approach. Nursing in Critical Care. 2024.

32. Wang TT, Yang B, Li YR, Zhang LL, Zhi XX, Wu B, et al. The mediating role of professional identity between work environment and caring behavior: A cross-sectional survey among hospice nurses in China. BMC Nursing. 2024;23(1):1-10.

33. Wang X, Xue J, Zhang A, Luo Y, Chen O, Liu C, et al. Job satisfaction and psychological factors influence the caring behavior in nurses in Sierra Leone: A cross-sectional study. Frontiers in Psychology. 2024;15:1418260.

34. Ahmed FR, Saifan AR, Dias JM, Subu MA, Masadeh R, AbuRuz ME. Level and predictors of caring behaviours of critical care nurses. BMC Nursing. 2022;21(1):341.

35. Lee H, Seo K. Mediating effect of compassion competence on the relationship between caring behaviors and quality of nursing services in South Korea. In: Healthcare. 2022 May;10(5):964. MDPI.

36. Qiu P, Yan L, Zhang Q, Guo S, Liu C, Liu H, Chen X. Organizational display rules in nursing: Impacts on caring behaviors and emotional exhaustion through emotional labor. International Nursing Review. 2024;71(3):571-579.

37. Yu M, Wang H, Wu Y, et al. The influence of emotional intelligence on psychiatric nurses' care behavior, and the chain mediating role of compassion fatigue and perception of management. J Psychosoc Nurs Ment Health Serv. 2024;1-9.

38. De Los Santos JAA, Labrague LJ. Job engagement and satisfaction are associated with nurse caring behaviours: A cross-sectional study. Journal of Nursing Management. 2021;29(7):2234-2242.

39. Fikre A, Egata G, Abdisa L, Yadeta E, Eyeberu A, Dheresa M. Perception of caring behaviors and associated factors among nurses working in Harar hospitals, Eastern Ethiopia. SAGE Open Nursing. 2022;8:2095797093. doi:10.1177/23779608221143909.

40. Kılıç M. A comparison of the nursing care perceptions of patients who underwent surgical intervention and the nurses providing care to those same patients. [master's thesis]. Çukurova University Institute of Health Sciences; 2014. Adana.

41. Göğüş F. A comparison of the caregiving behavior assessments of surgical patients and surgical nurses. [master's thesis]. Ankara University Institute of Health Sciences; 2016. Ankara.

42. Tor E. Determining the perceptions of nurses working in a university hospital regarding nursing caregiving behaviors. [master's thesis]. Trabzon: Eurasia University Institute of Health Sciences; 2021.

43. Parvan K, Zamanzadeh V, Hosseini FA. Assessment of professional values among Iranian nursing students graduating in universities with different norms of educational services. Thrita J Med Sci. 2012;2:37-43.

The Role of Gut Microbiota and Probiotics-Prebiotics in the Treatment of Cardiovascular Diseases

iD **Gülşah Çelik Korhan[1]**

[1]Harran University, Perfusion Technology, Sanliurfa, Türkiye

ABSTRACT

Cardiovascular diseases (CVD), a major cause of morbidity and mortality worldwide, are among the most well-known and extensively studied diseases. The onset and progression of CVD are associated with multiple risk factors, among which the gut microbiota has gained significant attention over the past two decades. The microbial community colonizing the gut, referred to as the gut microbiota, plays a crucial role in human health. In particular, gut dysbiosis is directly linked to various acute and chronic dysfunctions of the host's cardiovascular system. Previous studies have demonstrated a strong association between CVD pathogenesis, gut microbiota imbalance, and inflammatory responses. Probiotics and prebiotics, which provide various health benefits to the host, have emerged as promising therapeutic interventions for many diseases. These two types of dietary supplements have the potential to reduce cardiovascular disease risks by improving the levels of cardiovascular markers such as total and low-density lipoprotein (LDL) cholesterol, high-sensitivity C-reactive protein (hs-CRP), and specific cytokines related to the inflammatory response. This review discusses the protective effects of probiotics and prebiotics in balancing structural and functional changes in the gut microbiota and maintaining immune homeostasis.

Keywords: CVD, Probiotics, Prebiotics, Gut Microbiota, Immune Homeostasis.

INTRODUCTION

In recent years, cardiovascular diseases (CVD) have emerged as one of the leading causes of early mortality and morbidity in developing countries, particularly in low- and middle-income populations. In developed countries, more than half of the deaths in the middle-aged population and approximately one-third of deaths in the elderly population are associated with CVD (1). Unhealthy lifestyle factors such as an unbalanced diet, alcohol consumption, smoking, and physical inactivity play a significant role in the etiology of CVD and markedly increase disease risk. The beneficial effects of probiotics and prebiotics on host health have been extensively studied. The term "probiotic" originates from Greek and means "for life." The definition of probiotics, established by the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) in 2014 and endorsed by the International Scientific Association for Probiotics and Prebiotics (ISAPP), describes them as "carefully selected strains of live microorganisms that, when administered in adequate amounts, confer health benefits to the host" (2). The term "prebiotics" was first proposed by Gibson and Roberfroid in 1995 and was updated in 2004 as "non-digestible food components that allow specificity in microbial changes within the intestinal system." These components have been reported to exert beneficial effects on host health (3). Probiotics and prebiotics have beneficial effects on human health and have long been recognized as potential nutritional supplements for preventing the development of various intestinal diseases, such as diarrhea and inflammatory bowel disease (IBD). In addition to their effects on the intestinal system, increasing evidence supports their ability to exert direct functions. Moreover, both probiotics and prebiotics are believed to improve metabolic disorders, including obesity, diabetes, and CVD (4). Thanks to high-throughput techniques developed for sequencing the gut microbiota, the role of the gut microbiota in human health and well-being has been extensively investigated. A growing body of evidence suggests that alterations in the gut microbiota are associated with various diseases, including CVD (5).

A growing body of evidence suggests that alterations in the gut microbiota are associated with various diseases, including CVD. Imbalances in the gut microbiota have been linked to conditions such as heart failure, thrombosis, atherogenesis, and arterial hypertension (6,7). The beneficial effects of probiotics and prebiotics in altering the microbial and metabolic composition of the gut microbiota can be considered a potential therapeutic strategy for CVD. Furthermore, the protective effects of probiotic and prebiotic treatments on CVD can also be explained by the modulation of the host's immune system. The effects of probiotics and prebiotics are associated with changes in dendritic cells, epithelial cells, regulatory T cells, effector lymphocytes, natural killer T cells, and B cells. As in many chronic diseases, low-grade inflammation plays a significant role in CVD. The plasma levels of pro-inflammatory factors, such as IL-1, IL-6, and TNF-α, which are activated by both innate and adaptive immune cells, are often found to be elevated in CVD (8).

Cardiovascular Disease: Risk Factors and Development Mechanisms

CVD encompass conditions affecting the heart and blood vessels, such as coronary artery disease, stroke, hypertensive heart disease, cardiomyopathy, venous thrombosis, arrhythmias, and thromboembolic diseases. CVD has become an increasingly significant global health issue. It has been shown that CVDs can develop due to lesions in the coronary, cerebral, or peripheral arteries. Atherosclerosis, thrombosis, and coagulation are frequently involved in the pathophysiology of these diseases. The onset and progression of atherosclerosis are regulated by various immune responses (9).

Atherosclerosis is characterized by the formation and progressive growth of atherosclerotic plaques (primarily lipid-rich) in the arterial walls. The lipids in these plaques primarily originate from cholesterol derived from circulating LDL particles. Lipoproteins pass through the arterial subendothelial space, activating endothelial cells. Meanwhile, monocytes in the vascular wall take up lipoproteins and differentiate into macrophages, transforming into foam cells, which are a characteristic feature of the atherosclerotic plaque. Therefore, atherosclerosis is a lipid-focused, chronic inflammatory disease and a key predisposing factor for heart disease and stroke. The second most common pathophysiology of CVD involves coagulation, initially produced in an inactive form as a precursor or zymogen, which is then activated by a proteolytic reaction cascade (10). Among the factors that influence the risk of developing cardiovascular diseases are genetics and unhealthy lifestyle choices (lack of physical activity, poor diet, smoking, and alcohol consumption). Hypertension is considered the most common modifiable risk factor for cardiovascular diseases. High blood pressure is often associated with metabolic imbalances, which, similar to the effects of type 2 diabetes, can damage blood vessels and lead to high blood cholesterol levels, promoting the development of atherosclerosis. The reciprocal interaction between hypertension and hypercholesterolemia, and their effects on the development of atherosclerosis, involve the renin-angiotensin-aldosterone system and endothelial dysfunction (11,12).

Gut Microbiota and Cardiovascular Diseases

The gut microbiota refers to a community of microorganisms that inhabit our intestines, including bacteria, archaea, viruses, and unicellular eukaryotes. Among these microbial interactions, bacteria have been the most extensively studied to understand their roles in human health. It is estimated that the number of bacterial cells in the gastrointestinal tract (GIT) is approximately 3.8×10^{13}, which is similar to the total number of human cells in the body. However, the total mass of the gut microbiota in a healthy individual accounts for only about 0.3% of the total body weight (13). Surprisingly, the 9 million unique genes observed in the GIT through metagenomic studies are 450 times greater than the entire human genome (14). Increasing evidence links the gut microbiota to the development of various cardio-metabolic diseases, including diabetes mellitus, obesity, hypertension, and CVD (15). Certain unique bacterial species found in the gastrointestinal system have been reported to play critical roles in human health. Recently, although Akkermansia muciniphila has not been included in the list of traditional probiotics, it has been suggested to have the potential to be a next-generation probiotic. It has been demonstrated that the relative abundance of this bacterium is higher in healthy individuals compared to patients with obesity and diabetes (16). In stool samples from patients with CVD, a significant presence of pathogens such as Shigella, Campylobacter, Yersinia, Streptococcus spp., Enterobacteriaceae, and Candida has been observed. Additionally, it has been determined that the gut microbiota and its metabolites are strongly associated with the progression of CVD (17).

Metagenomic and metabolomic analyses of stool and plasma samples from healthy individuals and chronic heart failure (CHF) patients have revealed significant differences in the composition of the gut microbiota and its metabolites. In this study, the abundance of Faecalibacterium prausnitzii was found to be lower in CHF patients, while Ruminococcus gnavus was higher compared to controls. Additionally, increased levels of butyrate and decreased levels of trimethylamine N-oxide (TMAO) were observed in CHF. TMAO, one of the well-studied metabolites produced by the gut microbiota, shows a positive correlation with early-stage atherosclerosis (18). This metabolite increases the size of atherosclerotic plaques, triggers prothrombotic platelet function, and supports arterial thrombus growth. Another study revealed that high levels of TMAO produced through choline metabolism by the gut microbiota in female C57BL/6J ApoE-/- mice fed a choline diet promoted the development of atherosclerosis. Additionally, lipopolysaccharide (LPS), a cell wall component of Gram-negative bacteria, can negatively affect cardiovascular function and increase the risk of cardiovascular disease. Studies in animal models have shown that low-dose LPS intake leads to vascular inflammation and the development of atherosclerosis (19,20).

The Potential Effects of Probiotics and Prebiotics in Cardiovascular Diseases

Probiotics;

Fermented products such as yogurt, kefir, sauerkraut, tempeh, and kimchi have long been a part of the diet in various cultures as sources of probiotic strains. According to current information, probiotics include both bacterial species (Lactobacillus, Lactococcus, Leuconostoc, Pediococcus, Propionibacterium, Bifidobacterium, Bacillus, some Streptococcus, Enterococcus, Escherichia coli species) and yeast species (Saccharomyces) (21). The efficacy of probiotics is influenced by various factors, including their interactions with the host and microbiota. To exhibit a positive effect, probiotics must inhibit the growth of pathogenic bacteria (e.g., Enterococcus faecalis, Salmonella enterica subsp. enterica serotype Enteritidis, Listeria monocytogenes, Staphylococcus aureus, and Escherichia coli) through chemical or physical means and exert regulatory effects via immune, hormonal, and neuronal mechanisms. Additionally, it is important that they support the proliferation of beneficial microorganisms (22). According to the World Health Organisation, the number of viable cells in probiotic foods for human consumption should not be less than 106 cells per 1ml or 1g of product. In addition, the therapeutic dose should be 108-109 cells per 1ml or 1g of product. An important point is that the microorganisms it contains must be resistant to the effects of gastric juice and 6 of the 15 bile salts. After passing this chemical barrier, probiotics can adhere to the intestinal surface and exert their health-promoting functions (23).

Probiotic products are known to enhance non-specific cellular immune responses by activating natural killer cells and macrophages, and inducing the release of various cytokines. Additionally, they can improve intestinal mucosal immunity by increasing the number of IgA (+) cells. Furthermore, probiotics can aid the digestion process by assisting in the breakdown of lactose, enhancing the absorption of minerals, and stimulating the synthesis of several vitamins, such as thiamine, riboflavin, niacin, pantothenic acid, and vitamin K. They play an important role in the treatment of various conditions, including liver disease, diarrhea, and gastroenteritis. Moreover, they have been shown to exhibit antiproliferative, pro-apoptotic, and antioxidative properties (24).

Prebiotics;

Prebiotics are the most commonly used substances to maintain a normal gut microbiota and restore balance when homeostasis is affected. Prebiotics contain substances that stimulate the growth of microorganisms but do not contain bacteria in their composition. These substances can be derived from various sources such as soybeans and raw oats. However, plant oligosaccharides are the most popular prebiotics. Among the indigestible carbohydrates with prebiotic properties are polysaccharides (resistant starch, pectin, and dextrin), fructo-oligosaccharides, galacto-oligosaccharides, xylooligosaccharides, isomaltooligosaccharides, mannanoligosaccharides, raffinose oligosaccharides, arabinoxylan oligosaccharides, lactulose, and inulin. Prebiotics have the potential to improve human health by regulating the balance of the gut microbiome (25,26).

Prebiotics fermented by gut bacteria produce short-chain fatty acids such as propionate, butyrate, and acetate. The production of short-chain fatty acids has positive effects, including improving gut barrier integrity, enhancing mineral absorption, lowering glycemic levels and body weight, strengthening immunity, and modulating metabolic, cardiovascular, and inflammatory biomarkers. Additionally, the intake of prebiotics promotes the growth of beneficial bacteria, such as Lactobacillus and Bifidobacterium, which inhibit the proliferation of harmful bacteria. Due to the health benefits they provide, prebiotics are increasingly being used as functional ingredients in the food industry. These compounds can be utilized in the production of whole wheat bread, cereal bars, chocolate, dairy products, infant formulas, and meat products. In addition to natural sources, microorganisms and enzymes can also be used for the synthesis of prebiotic compounds (27,28).

The Effect of Probiotics and Prebiotics on the Mechanisms Leading to Cardiovascular Diseases

Oxidative Stress;

Oxidative stress plays a major role in the course of cardiovascular diseases. This important, high levels of intracellular oxygen radicals have detrimental effects on lipids, proteins and DNA. Reactive oxygen species (ROS) include highly active free radicals such as superoxide anion radicals, hydroxyl radicals and hydrogen peroxide. Most organisms use enzymatic defences (superoxide dismutase (SOD), glutathione peroxidase (GPx), glutathione reductase (GR), catalase (CAT) and non-enzymatic antioxidant defences (glutathione (GSH), thioredoxin, vitamin C, vitamin E) to protect against oxidative stress. Furthermore, organisms have repair systems to neutralise these radicals. However, these natural antioxidant systems may often be insufficient to prevent oxidative damage in organisms. Many studies have demonstrated that probiotic bacteria exhibit significant antioxidant capacities in both in vivo and in vitro environments. ROS can be generated from both endogenous and exogenous sources. These highly reactive molecules have the potential to modify other oxygen species, DNA, proteins, or lipids. Excessive ROS production is believed to lead to genomic instability, contributing to the development of chronic diseases such as atherosclerosis and cardiovascular diseases. ROS are produced through various enzymatic reactions and chemical processes, with the NADPH oxidase (NOX) complex recognized as the primary source of ROS production. NOX complex is considered the primary source of ROS production. In humans, there are seven NOX homologs that intentionally produce ROS for host defense and signaling functions. Recently, Gómez-Guzmán and colleagues suggested that the combination of probiotics Lactobacillus fermentum CECT5716, Lactobacillus coryniformis CECT5711 (K8), and Lactobacillus gasseri CECT5714 (LC9) (1:1) could reduce NOX activity and the mRNA expression of NOX-1 and NOX-4 in spontaneously hypertensive rats.

Many studies have focused on the antioxidant properties of probiotics. It has been determined that the culture supernatant, intact cells, and intracellular extracts of Bifidobacterium animalis 01 eliminate hydroxyl radicals and superoxide anions in in vitro environments. Furthermore, oxidative stress in patients with type 2 diabetes has been observed to be reduced by various probiotics. Lactic acid bacteria (LAB) have been extensively studied in both animals and humans, and it has been demonstrated that LAB may exhibit resistance against reactive oxygen species such as peroxide radicals, superoxide anions, and hydroxyl radicals. Rats fed high-fat diets supplemented with Lactobacillus plantarum P-8 exhibited high antioxidant capacity by reducing hepatic lipid accumulation and maintaining healthy liver function. In humans, Lactobacillus rhamnosus has shown strong antioxidant activity under conditions of high physical stress. As a result, recent studies have demonstrated that probiotic bacterial strains may possess antioxidant capacity in various forms (29,30).

Inflammation;

Subclinical inflammation forms the basis of many diseases. This inflammation increases with aging and becomes particularly common in older individuals. It is also an important risk factor for cardiovascular diseases. In these cases, it is often observed that plasma levels of pro-inflammatory mediators such as TNF-α, IL-1, and IL-6 are elevated. Inflammation is commonly associated with increased intestinal permeability. This condition increases the passage of bacterial-derived pro-inflammatory mediators, such as lipopolysaccharide (LPS), from the intestine to the bloodstream. An increase in lipopolysaccharide-binding protein (LBP) levels has previously been reported to be associated with an

increased cumulative incidence of cardiovascular diseases. LPS and other bacterial cell membrane components are recognized by certain receptors on endothelial cells. The binding of LPS to endothelial cells leads to the direct activation of adhesion molecules such as ICAM-1 and P-selectin, which play a crucial role in interactions with leukocytes. These data emphasize the critical role of the gut microbiota in controlling intestinal permeability and endotoxemia, highlighting its significant contribution to the development of chronic low-grade inflammation and the increased risk of cardiovascular diseases. It also increases interest in intervention strategies targeting the microbiota, as reducing low-grade inflammation is seen as a potential way to prevent cardiovascular diseases. Therefore, food components such as probiotics and prebiotics are considered promising tools for the dietary management of cardiovascular disease risk.

Tenorio-Jiménez and colleagues reported that the administration of L. reuteri V3401 for 12 weeks not only reduced the risk of CVD but also decreased the levels of inflammation biomarkers such as TNF-α, IL-6, IL-8, and soluble intercellular adhesion molecule-1 in obese adults aged 18 to 65 with metabolic syndrome. However, although some studies have shown that probiotics can reduce the production of proinflammatory cytokines, the underlying mechanisms of these effects are still not well understood. In recent years, numerous studies have been conducted on the use of dietary fibers and prebiotics, as most of these polysaccharides are metabolized by the gut microbiota, leading to the production of short-chain fatty acids. The fermentation of prebiotics produces these metabolites, which exhibit anti-inflammatory and immunomodulatory properties (33).

Hypercholesterolemia and Hypertension;

It is suggested that probiotics may reduce cholesterol levels through various mechanisms. Most species of Bifidobacterium exhibit higher coliglycine hydrolase activity compared to other microorganisms. This enzyme hydrolyzes the amide bonds conjugated with taurine or glycine in bile acids, facilitating the release of primary bile acids. These acids easily precipitate at low pH and are excreted from the gastrointestinal system. Since they are not reabsorbed from the intestines, they must be replaced by newly synthesized bile acids, which are derived from blood cholesterol in the liver. Probiotics may have cholesterol-lowering effects through the action of bile salt hydrolase enzyme (a probiotic enzyme that hydrolyzes bile salts into amino acid residues and free bile acids). These beneficial effects have been demonstrated in both animal models and clinical studies. Furthermore, the relationship between the gut microbiota, probiotics, and lipid metabolism disorders has been thoroughly elucidated. In a randomized, single-blind, controlled clinical study, 70 pregnant women in their third trimester were given a daily supplement of 200 g probiotic yogurt for nine weeks. This probiotic yogurt, containing Streptococcus thermophilus, Lactobacillus bulgaricus, Lactobacillus acidophilus LA-5, and Bifidobacterium animalis BB12, resulted in a significant decrease in total cholesterol, low-density lipoprotein (LDL) cholesterol, high-density lipoprotein (HDL) levels, and serum triglyceride concentrations (34). In a study conducted by Hoppu and colleagues, 256 pregnant women were divided into three groups—probiotic diet counseling (with L. rhamnosus GG and B. lactis), placebo diet counseling, and no counseling (control group) and followed from the first trimester of pregnancy to 12 months postpartum. Similar lipid serum levels were observed during pregnancy across the groups.

Other studies have observed the beneficial effects of probiotic supplementation in dyslipidemia through small-scale, double-blind, placebo-controlled trials. It has been stated that probiotic supplementation reduces blood lipid concentrations (35). Lew and colleagues, who identified L. plantarum DR7 with cholesterol-lowering properties through AMPK phosphorylation, reported that another research group suggested probiotic L. plantarum PH40 may also have cholesterol-lowering properties. Probiotics play an important role in the treatment of various diseases, such as liver disease, diarrhea, and gastroenteritis. Additionally, it has been shown that probiotics possess antioxidant, antiplatelet, and anti-inflammatory properties, and they also lower cholesterol levels (Figure 3) (36).
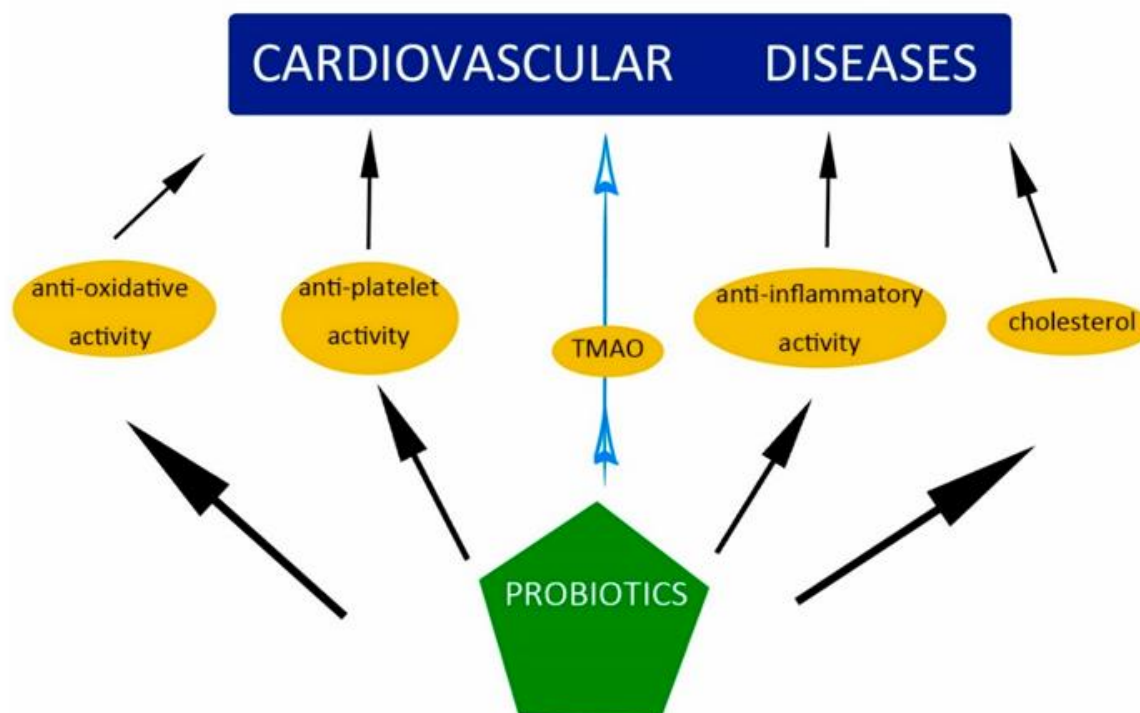
Figure 3. The effect of probiotics on cardiovascular disease (36).

Prebiotics also reduce cholesterol levels. Parnell and Reiner reported that prebiotic intake reduced total serum cholesterol in a hypercholesterolemic rat model. Prebiotics also lower cholesterol levels. Parnell and Reiner reported that prebiotic intake reduced total serum cholesterol in a hypercholesterolemic rat model. In this study, rats were fed three different diets containing 0%, 10%, or 20% prebiotic fiber for 10 weeks. Both doses of prebiotic fiber reduced serum cholesterol levels by approximately 25%. Additionally, this change has been associated with an increase in cecal digesta (a mixture of digested food and fluids from the small intestine directed to the large intestine) and the upregulation of genes related to cholesterol biosynthesis and bile production. In addition, obese rats receiving 10% prebiotic supplementation showed approximately a 40% reduction in hepatic triacylglycerol accumulation. Obesity is commonly associated with the progression of cardiovascular diseases, and both probiotic and prebiotic intake have been reported to exhibit anti-obesogenic effects in various clinical studies (37).

CONCLUSION

CVD, recognized as one of the leading causes of morbidity and mortality worldwide, have recently emerged as a prominent research focus in the context of their relationship with the gut microbiota. Traditionally associated solely with digestive health, the gut microbiota is now recognized as a crucial factor directly influencing cardiovascular health through key mechanisms such as inflammation regulation, lipid metabolism control, immune system modulation, and the maintenance of endothelial function. In this context, probiotics and prebiotics, which have the potential to maintain and improve gut microbiota balance, are gaining increasing importance in the prevention and treatment of CVD. Research highlights the beneficial effects of probiotics, particularly in the management of dyslipidemia, and suggests that certain probiotic strains may reduce the risk of atherosclerosis. For instance, specific bacterial strains such as Lactobacillus plantarum, Lactobacillus rhamnosus, and Bifidobacterium bifidum have been shown to exert beneficial effects on lipid profiles by lowering serum cholesterol levels. These bacteria modify bile salt metabolism, thereby reducing cholesterol absorption and contributing to systemic lipid homeostasis. Clinical studies further support the significant effects of probiotic supplementation in lowering LDL cholesterol levels, increasing HDL cholesterol, and balancing total cholesterol levels.

On the other hand, the gut microbiota plays a key role in regulating inflammatory processes. Chronic inflammation is known to be a central factor in the pathophysiology of CVD and is directly linked to

conditions such as atherosclerosis, hypertension, and myocardial infarction. Disruption of microbial balance can trigger inflammatory responses, negatively impacting vascular functions. Probiotics enhance the anti-inflammatory response by increasing microbial diversity in the gut and reducing levels of inflammatory cytokines (IL-6, TNF-α). The increase of bacteria known for their anti-inflammatory properties, such as Faecalibacterium prausnitzii, in the gut microbiota may contribute to the improvement of endothelial function.

The mechanism known as the gut-brain-heart axis reveals that the gut microbiota is not only limited to the digestive system but also affects the neuroendocrine and cardiovascular systems. Microbial metabolites, particularly short-chain fatty acids (SCFAs) such as butyrate, propionate, and acetate, play a crucial role in regulating vascular tone and blood pressure, while also reducing systemic inflammation by protecting intestinal epithelial cells. Clinical data suggest that probiotic supplementation can lower blood pressure, indicating that probiotics may be considered as a complementary agent in the treatment of hypertension.

Recent advancements in innovative probiotic and prebiotic formulations aim to maximize their positive effects on cardiovascular health. Symbiotics, which capitalize on the synergistic effects of probiotics and prebiotics, along with postbiotics that enhance biological activity, have the potential to make therapeutic approaches more effective. Moreover, advanced biotechnological methods such as genetic engineering and CRISPR enable the design of probiotics with more specific and targeted effects, paving the way for the development of personalized treatment strategies. In particular, the development of Lactobacillus species that can regulate cholesterol metabolism more effectively through specific genetic modifications could play a crucial role in future personalized cardiovascular treatment approaches.

The role of gut microbiota and probiotics is gaining more attention in cardiovascular surgery. Ischemic damage to the intestinal mucosa may occur during cardiopulmonary bypass (CPB), which can increase the risk of bacterial translocation and potentially trigger the development of systemic inflammatory response syndrome (SIRS). Research indicates that probiotics may help reduce bacterial translocation by enhancing intestinal barrier functions, thereby preventing postoperative complications. Furthermore, the antioxidant effects of metabolites derived from the gut microbiota, along with their properties that support endothelial function, have the potential to accelerate the recovery process following cardiovascular surgery. Ultimately, the gut microbiota is emerging as a prominent research focus in the prevention and treatment of CVD. Probiotics and prebiotics can play a crucial role in cardiovascular health by regulating inflammation, improving lipid metabolism, maintaining intestinal barrier integrity, and enhancing microbial diversity through various mechanisms. However, to better understand these effects and integrate them into clinical practice, large-scale randomized controlled trials are required. In the future, the development of personalized probiotic and prebiotic treatment strategies targeting the gut microbiota could represent a groundbreaking step in the prevention and management of CVD. With technological advancements, it is anticipated that microbiota-based therapies will become more widespread in cardiovascular health management.

DESCRIPTIONS

No financial support.

No conflict of interest.

REFERENCES

1. Roger VL, Go AS, Lloyd-Jones DM, et al. Heart disease and stroke statistics—2012 update: A report from the American Heart Association. Circulation. 2010;125(1):188. doi:10.1161/CIR.0b013e31823ac046.

2. Hill C, Guarner F, Reid G, et al. Expert Consensus Document: The International Scientific Association for Probiotics and Prebiotics consensus statement on the scope and appropriate use of the term probiotic. Nat Rev Gastroenterol Hepatol. 2014;11(8):506-516. doi:10.1038/nrgastro.2014.66.

3. Gibson GR, Roberfroid MB. Dietary modulation of the human colonic microbiota: Introducing the concept of prebiotics. J Nutr. 1995;125(6):1401-1412. doi:10.1093/jn/125.6.1401.

4.   Cerdó T, García-Santos JA, Bermúdez MG, Campoy C. The role of probiotics and prebiotics in the prevention and treatment of obesity. Nutrients. 2019;11(3):635. doi:10.3390/nu11030635.

5. Tringe S, von Mering C, Kobayashi A, et al. Comparative metagenomics of microbial communities. Science. 2005;308(5721):554-7. doi:10.1126/science.1107851.

6. Kitai T, Tang WW. Gut microbiota in cardiovascular disease and heart failure. Clin Sci. 2018;132(1):85-91. doi:10.1042/CS20171090.

7. Pevsner-Fischer M, Blacher E, Tatirovsky E, Ben-Dov I, Elinav E. The gut microbiome and hypertension. Curr Opin Nephrol Hypertens. 2017;26(1):1-8. doi:10.1097/MNH.0000000000000293.

8. Frei R, Akdis M, O'Mahony L. Prebiotics, probiotics, synbiotics, and the immune system. Curr Opin Gastroenterol. 2015;31(2):153-158.

9. Kurilenko N, Fatkhullina A, Mazitova A, Koltsova E. Act locally, act globally: microbiota, barriers, and cytokines in atherosclerosis. Cells. 2021; 10:348. doi:10.3390/cells10020348.

10. Paganelli F, Mottola G, Fromonot J, et al. Hyperhomocysteinemia and cardiovascular disease: Is the adenosinergic system the missing link? Int J Mol Sci. 2021;22(4):1690. doi:10.3390/ijms22041690

11. Krasi G, Precone V, Paolacci S, et al. Genetics and pharmacogenetics in the diagnosis and therapy of cardiovascular diseases. Acta Biomed. 2019; 90:7-19. doi:10.23750/abm. v90i10-S.8748

12. Ma W, Zhang B, Yang Y, et al. Correlating the relationship between interarm systolic blood pressure and cardiovascular disease risk factors. J Clin Hypertens. 2017;19(5):466-471. doi:10.1111/jch.12987

13. Sender R, Fuchs S, Milo R. Revised estimates for the number of human and bacteria cells in the body. PLoS Biol. 2016;14(8): e1002533. doi: 10.1371/journal.pbio.1002533.

14. Yang X, Xie L, Li Y, Wei C. More than 9,000,000 unique genes in human gut bacterial community: Estimating gene numbers inside a human body. PLoS ONE. 2009;4(5): e6074.

15. Arora T, Bäckhed F. The gut microbiota and metabolic disease: Current understanding and future perspectives. J Intern Med. 2016; 280:339-349. doi:10.1111/joim.12508

16. Plovier H, Everard A, Druart C, et al. A purified membrane protein from Akkermansia muciniphila or the pasteurized bacterium improves metabolism in obese and diabetic mice. Nat Med. 2017; 23:107-113. doi:10.1038/nm.4236.

17. Jie Z, Xia H, Zhong SL, et al. The gut microbiome is an atherosclerotic cardiovascular disease. Nat Commun. 2017; 8:845. doi:10.1038/s41467-017-00900-1.

18. Randrianarisoa E, Lehn-Stefan A, Wang X, et al. Relationship of serum trimethylamine N-oxide (TMAO) levels with early atherosclerosis in humans. Sci Rep. 2016; 6:26745. doi:10.1038/srep26745.

19. Gregory JC, Buffa JA, Org E, et al. Transmission of atherosclerosis susceptibility with gut microbial transplantation. J Biol Chem. 2015;290(9):5647-5660. DOI: 10.1074/jbc.M114.618249

20. Li J, Lin S, Vanhoutte PM, et al. Akkermansia muciniphila protects against atherosclerosis by preventing metabolic endotoxemia-induced inflammation in ApoE-/- mice. Circulation. 2016;133(24):2434-2446. doi:10.1161/CIRCULATIONAHA.115.019645

21. Kothari D, Patel P, Kim SK. Probiotic supplements might not be universally effective and safe: A review. Biomed Pharmacother. 2019; 111:537-547. doi:10.1016/j.biopha.2018.12.104.

22. Žućko J, Starčević A, Dimić J, Oros D, Mortazavian AM, Putnik P. Probiotic—friend or foe? Curr Opin Food Sci. 2020; 32:45-49. doi:10.1016/j.cofs.2020.01.007.

23. Pandey KR, Naik SR, Vakil BV. Probiotics, prebiotics and synbiotics—A review. J Food Sci Technol. 2010; 52:7577-7587.

24. Nowak A, Paliwoda A, Błasiak J. Anti-proliferative, pro-apoptotic and anti-oxidative activity of Lactobacillus and Bifidobacterium strains: A review of mechanisms and therapeutic perspectives. Crit Rev Food Sci Nutr. 2019;59(21):3456-3467. doi:10.1080/10408398.2018.1494539

25. Quigley EMM. Prebiotics and probiotics in digestive health. Clin Gastroenterol Hepatol. 2019;17(2):333-344. doi: 10.1016/j.cgh.2018.09.028

26. Colantonio AG, Werner SL, Brown M. The effects of prebiotics and substances with prebiotic properties on metabolic and inflammatory biomarkers in individuals with type 2 diabetes mellitus: A systematic review. J Acad Nutr Diet. 2020; 120:587-607.

27. Mohanty D, Misra S, Mohapatra S, Sahu PS. Prebiotics and synbiotics: Recent concepts in nutrition. Food Biosci. 2018; 26:152-160. doi: 10.1016/j.fbio.2018.10.008.

28. Khangwal I, Shukla P. Potential prebiotics and their transmission mechanisms: Recent approaches. J Food Drug Anal. 2019; 27:649-656. doi: 10.1016/j.jfda.2019.02.003.

29. Wang Y, Wu Y, Wang Y, et al. Antioxidant properties of probiotic bacteria. Nutrients. 2017;9(5):521. doi:10.3390/nu9050521.

30. Wang Y, Wu Y, Wang Y, et al. Bacillus amyloliquefaciens SC06 alleviates the oxidative stress of IPEC-1 via modulating Nrf2/Keap1 signaling pathway and decreasing ROS production. Appl Microbiol Biotechnol. 2016;101(1):1-12. doi:10.1007/s00253-016-8032-4.

31. Formes H, Reinhardt C. The gut microbiota—a modulator of endothelial cell function and a contributing environmental factor to arterial thrombosis. Expert Rev Hematol. 2019;12(6):541-549. doi:10.1080/17474086.2019.1627191.

32. Formes H, Reinhardt C. The gut microbiota—a modulator of endothelial cell function and a contributing environmental factor to arterial thrombosis. Expert Rev Hematol. 2019;12(6):541-549. doi:10.1080/17474086.2019.1627191.

33. Farias DP, Araújo FF, Neri-Numa IA, Pastore GM. Prebiotics: Trends in food, health and technological applications. Trends Food Sci Technol. 2019; 93:23-35.

34. Jung S, Lee YJ, Kim M, et al. Supplementation with two probiotic strains, Lactobacillus curvatus HY7601 and Lactobacillus plantarum KY1032, reduced body adiposity and Lp-PLA$_2$ activity in overweight subjects. J Funct Foods. 2015; 19:744–52.

35. Jiang J, Wu C, Zhang C, et al. Effects of probiotic supplementation on cardiovascular risk factors in hypercholesterolemia: A systematic review and meta-analysis of randomized clinical trials. J Funct Foods. 2020; 74:104-177.

36. Lew LC, Choi SB, Khoo BY, Sreenivasan S, Ong KL, Liong MT. Lactobacillus plantarum DR7 reduces cholesterol via phosphorylation of AMPK that down-regulated the mRNA expression of HMG-CoA reductase. Kor J Food Sci Animal Res. 2018; 38:350-361.

37. Kim B, Choi HN, Yim JE. Effect of diet on the gut microbiota associated with obesity. J Obes Metab Syndr. 2019;28(4):216-222. doi:10.7570/jomes.2019.28.4.216.

The Role of Nurses as Guides in Inflammatory Bowel Diseases

ⓘ Seval Akben[1], ⓘ Nuran Tosun[2], ⓘ Hüseyin Yaşar[1]

[1]Kahramanmaraş Sütçü İmam University, Göksun Vocational School, Department of Medical Services and Techniques, Kahramanmaraş, Türkiye
[2]Hasan Kalyoncu University, Faculty of Health Sciences, Department of Nursing, Gaziantep, Türkiye

ABSTRACT

Inflammatory Bowel Diseases are a group of chronic and recurrent inflammatory disorders affecting the gastrointestinal system, with unknown etiology. Crohn's Disease and Ulcerative Colitis are the most common subtypes, associated with physical symptoms and psychosocial issues that negatively impact the quality of life. The management of Inflammatory Bowel Diseases requires a multidisciplinary approach, and the guiding role of nurses is critical for symptom management, treatment adherence, and enhancing patients' quality of life.

Nurses actively participate in symptom management, nutritional counseling, psychosocial support, and patient education, creating individualized care plans tailored to patients' needs. Specifically, nutritional management, psychosocial support, and educational strategies help alleviate symptoms and improve treatment adherence. Additionally, the utilization of health technologies, such as mobile health applications and tele-health services, facilitates patient follow-up and enhances treatment processes.

Psychosocial support services assist patients in managing stress, depression, and anxiety, thereby positively impacting their quality of life. Moreover, support groups and counseling services reduce social isolation and strengthen psychological resilience. Nurses play a crucial role in patient education and raising public awareness, which helps reduce social stigma and improves patients' compliance with treatment.

This review highlights the importance of nursing guidance in the management of Inflammatory Bowel Diseases and provides a guiding perspective for future research. Multidisciplinary teamwork, individualized care plans, and the integration of digital health applications are effective strategies for improving the quality of life of Inflammatory Bowel Diseases patients. In this context, strengthening the educational and counseling roles of nurses is essential for effective Inflammatory Bowel Diseases management.

Keywords: Bowel Diseases, Inflammatory, Crohn's Disease, Ulcerative Colitis, Internal Medicine Nursing, Patient Education.

INTRODUCTION

Inflammatory bowel diseases (IBD) are a group of chronic disorders characterized by persistent and lifelong inflammatory processes affecting the gastrointestinal tract. The exact etiology is unknown, but it is believed to result from complex interactions between genetic, environmental, and immunologic factors (1-3). The most common subtypes of IBD are Crohn's disease (CD) and ulcerative colitis (UC). Although these diseases share some clinical and pathological similarities, they exhibit distinct histopathological differences (4). Ulcerative colitis is characterized by recurrent ulcerative and inflammatory reactions in the mucosal and submucosal layers of the colon and rectum, leading to symptoms such as bloody diarrhea, abdominal pain, and urgency. In contrast, CD can occur anywhere in the gastrointestinal tract but most commonly affects the terminal ileum and colon. CD is characterized by transmural inflammation that can lead to segmental (skipping) lesions, fistulas, and strictures. As a result, CD is sometimes referred to as "Regional Enteritis" due to its localized and patchy distribution (3). The incidence and prevalence of IBD vary significantly depending on regional and socioeconomic factors. In developed countries such as North America and Western Europe, the prevalence and incidence of IBD have stabilized. In contrast, there is an increasing trend in disease rates in developing regions such as Eastern Europe, Asia, Western India, and North Africa. In particular, in East Asia, the average annual prevalence increase of IBD has been estimated as 2.79% (5). Global burden of disease studies show that the number of IBD patients has increased from 3.3 million in 1990 to 4.9 million in 2019. In addition, the global incidence of IBD was reported as 4.98 per 100,000 population in 2019 (5).

Although large-scale population-based studies on IBD in Turkiye are limited, several hospital-based cross-sectional studies provide valuable insights. According to these studies, the incidence of UC in Turkey is 2.6 per 100,000 and the incidence of CD is 1.4 per 100,000 (6-9). Data show that the incidence of IBD in Turkey has increased over time, with a higher prevalence in men than in women (3,9). Furthermore, the distribution of the disease varies by geographic location, with CD being more common in urban areas, while UC is more common in rural areas (9).

These findings suggest that IBD is becoming more prevalent and may pose a significant public health problem in the coming years, requiring enhanced public health surveillance, patient education, and healthcare resource allocation.

Diagnostic Process and Evaluation

IBD is a group of chronic diseases with heterogeneous clinical manifestations that require a comprehensive and multidisciplinary approach for accurate diagnosis. Due to the complex and variable nature of IBD, no single test can confirm the diagnosis and requires the use of multiple diagnostic modalities to reach a definitive diagnosis.

This approach includes a combined evaluation of clinical symptoms, laboratory tests, biomarkers, and imaging techniques (10,11). Clinical evaluation focuses on identifying characteristic symptoms such as chronic diarrhea, abdominal pain, weight loss, and fatigue, which are common in both CD and UC but may differ in presentation and severity.

Laboratory tests and biomarkers are used to assess systemic inflammation and differentiate IBD from other gastrointestinal conditions. Common biomarkers include C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), fecal calprotectin, and fecal lactoferrin, which help assess disease activity and severity. In addition, genetic testing and serologic markers may provide supportive diagnostic information, particularly in distinguishing between CD and UC.

Endoscopic and imaging techniques are required to visualize the mucosal inflammation, ulcerations, strictures, and fistulas characteristic of IBD. Colonoscopy with biopsy remains the gold standard for diagnosing and differentiating between CD and UC. Findings in UC usually include persistent mucosal inflammation starting from the rectum, whereas segmental skip lesions, transmural inflammation, and cobblestone appearance are more common in CD. Advanced imaging modalities such as Magnetic Resonance Enterography (MRE) and Computed Tomography Enterography (CTE) allow detailed assessment of small bowel involvement, particularly in CD.

The primary goal of the diagnostic process is to differentiate IBD from other inflammatory and infectious gastrointestinal diseases, such as infectious colitis, ischemic colitis, and irritable bowel syndrome (IBS), and to determine the level of disease activity (12). Accurate and early diagnosis is crucial to initiate appropriate therapeutic interventions and improve long-term patient outcomes.

Clınical Symptoms And Findings

The most common symptoms of IBD include chronic diarrhea, abdominal pain, weight loss, hematochezia (bloody stools), and fatigue (13). However, the pattern of disease spread and the depth of intestinal wall involvement differ significantly between CD and UC and affect the clinical presentation and diagnostic approach (14). In Crohn's disease, inflammation can occur in any segment of the gastrointestinal tract from the mouth to the anus, but most commonly affects the terminal ileum and colon. CD is characterized by transmural inflammation, meaning that inflammation extends to all layers of the intestinal wall and can lead to fibrosis, stenosis, fistula formation, and abscesses. Clinically, it is characterized by segmental involvement, i.e., skip lesions, where inflamed areas are interspersed with healthy tissue. Deep ulcerations, cobblestone appearance of the mucosa, and stenosis are characteristic endoscopic findings. Patients with CD usually experience right lower quadrant abdominal pain due to terminal ileum involvement. Unlike UC, stools in CD are usually not bloody, but patients may have symptoms of malabsorption such as steatorrhea (oily stools) and vitamin B12 deficiency and anemia. Fistulas and perianal disease, such as perianal abscesses, fissures, and skin tags, are more common than in UC and contribute to significant morbidity (10,11).

In ulcerative colitis, inflammation is limited to the colon and rectum and progresses continuously from the rectum proximally through the colon without bypassing the lesion. Unlike CD, UC affects only the mucosal and submucosal layers, leading to superficial ulcerations and crypt abscesses. Bloody diarrhea with mucus, tenesmus (a constant desire to defecate), and urgency are the hallmark symptoms of UC (15). Abdominal pain is usually felt in the left lower quadrant, consistent with the affected sigmoid colon and rectum. Compared with CD, systemic symptoms such as fever, malaise, and weight loss are less pronounced in UC, except during severe exacerbations. However, extraintestinal manifestations are common in both CD and UC (16).

Extraintestinal manifestations occur in approximately %25–% 40of patients with IBD and may precede, accompany, or follow intestinal symptoms, and are usually related to disease activity. The most common are extraintestinal manifestations;

- Musculoskeletal: Peripheral arthritis, ankylosing spondylitis, and sacroiliitis are more common in CD but can also be seen in UC.
- Dermatologic: Erythema nodosum (tender red nodules on the legs) and pyoderma gangrenosum (painful skin ulcers) are often associated with IBD.
- Ocular: Uveitis, episcleritis, and conjunctivitis may occur, and uveitis is more common in CD.
- Hepatobiliary: Primary sclerosing cholangitis (PSC) is predominantly associated with UC and is a risk factor for cholangiocarcinoma.
- Hematologic and Metabolic: Anemia (due to chronic inflammation and malabsorption), osteoporosis, and vitamin deficiencies are common in both CD and UC. These systemic manifestations are particularly prominent during disease flares and may provide valuable diagnostic clues. Comprehensive management requires a multidisciplinary approach involving rheumatologists, dermatologists, ophthalmologists, and hepatologists (11,12).

Laboratory Tests and Biomarkers

Although there is no definitive laboratory test for the diagnosis of IBD, various biomarkers are used to assess the inflammatory activity and severity of the disease (13). These biomarkers not only help distinguish IBD from other gastrointestinal disorders, but also help monitor disease activity, therapeutic response, and predict relapses.

The primary biomarkers used in clinical practice include Complete Blood Count (CBC), C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), fecal calprotectin, and fecal lactoferrin (14). In addition, serum albumin, iron levels, and thiopurine methyltransferase (TPMT) activity provide valuable information about nutritional status, systemic inflammation, and drug metabolism. These biomarkers and their clinical implications are summarized;

- **C-reactive Protein:** CRP is an acute phase reactant synthesized by the liver in response to systemic inflammation. It is a sensitive marker of active inflammation and is often used to assess disease activity and response to therapy in IBD. In IBD, CRP levels are often elevated during disease flares and correlate with disease severity. Higher CRP levels are more common in CD compared to UC due to the transmural nature of inflammation in CD (12). Normal CRP levels do not necessarily exclude active disease, especially in UC patients, because CRP elevation is less sensitive in mucosal inflammation.

- **Erythrocyte Sedimentation Rate:** ESR is another marker of systemic inflammation that reflects the rate at which erythrocytes settle in anticoagulated blood. It is often used in conjunction with CRP to assess disease activity. ESR is elevated in active IBD but is known to be less sensitive and less precise than CRP for detecting inflammation (11).

- **Fecal Calprotectin and Fecal Lactoferrin:** These biomarkers are highly specific for intestinal inflammation and are used to differentiate IBD from functional gastrointestinal disorders such as Irritable Bowel Syndrome (15). Fecal calprotectin has been associated with mucosal inflammation and is used to monitor disease activity (16).

- **Serum Albumin and Iron Levels:** Serum albumin and iron levels help evaluate nutritional status and systemic inflammation in IBD patients.

- **Thiopurine Methyltransferase Activity:** TPMT activity is used to evaluate drug response in patients who will be starting immunosuppressive therapy (12).

Endoscopic And Radiologic Evaluation

Endoscopic and radiological evaluation is necessary for definitive diagnosis of IBD. Endoscopic imaging is one of the most important methods for evaluating the extent of the disease, the degree of inflammation and mucosal healing (14). Colonoscopy is considered the gold standard for differentiating UC and CD (10). While mucosal edema, fragility, erosions and diffuse ulcerations are observed in UC, segmental involvement, deep ulcers, cobblestone appearance and strictures are prominent in CD (12). Biopsy and histopathological examination have an important role in reaching a definitive diagnosis. Crypt abscess and goblet cell loss are characteristic findings in UC, while non-caseating granulomas and transmural inflammation are characteristic findings in CD (15).

Radiological examinations play an important role in evaluating small bowel involvement, especially in CD. Magnetic Resonance (MR) and Computed Tomography (CT) are preferred to determine bowel wall thickening, edema and strictures. MRI is particularly preferred because it is a radiation-free method and is a safe option for evaluating active inflammation (11,16).

Capsule endoscopy allows detailed examination in patients with small bowel involvement; however, caution should be exercised in patients at risk of intestinal stricture due to the possibility of capsule compression (11,12). The diagnostic process of IBD requires a multidisciplinary approach that includes evaluation of clinical symptoms, laboratory tests, biomarker analyses, endoscopic examinations and radiological imaging due to the heterogeneous nature of the disease. The combined use of these methods facilitates early diagnosis of the disease and makes significant contributions to the determination of treatment strategies.

Role And Responsibilities of Nurses

Inflammatory Bowel Disease is a chronic disease that significantly affects the quality of life of patients and requires a multidisciplinary management process. Nurses should adopt a multidimensional approach in the management of IBD, not only providing symptom control, but also patient education, nutritional support, psychosocial support, and prevention of complications (11,17). The Roles and Responsibilities of Nurses in Inflammatory Bowel Disease are grouped in Table 1.

Table 1. Roles and Responsibilities of the Nurse in Inflammatory Bowel Disease

Role/Responsibility	Description
Comprehensive Nursing Assessment	The patient's disease history, symptom severity, nutritional status, psychosocial needs and quality of life should be assessed, and patient education, pharmacological treatment compliance, symptom management and psychological support should be provided in line with individualized care plans (11).
Care Plans Should Be Dynamic	Care plans should be updated regularly, considering the remission and exacerbation periods of the disease. Nurses should play an active role in monitoring the clinical course of patients by encouraging them to keep symptom diaries (16).
Patient-Centered Approach	Patients with IBD should be encouraged to actively participate in the treatment process and should be supported in self-care skills. Effective education programs are critical for disease management and treatment compliance (15).

Today, the development of individualized nursing care plans, strengthening multidisciplinary teamwork, and integrating evidence-based practices into clinical practice stand out as fundamental strategies for improving patients' quality of life (14,15). The symptom profile, severity of disease, and systemic effects of IBD patients may vary among individuals. Therefore, instead of standard care protocols, individualized care plans should be created that are appropriate for each patient's clinical findings, lifestyle, and psychosocial status (12). Symptoms that directly affect the quality of life of IBD patients

include chronic diarrhea, abdominal pain, weight loss, fatigue, and psychosocial effects, and nursing care approaches for the management of these symptoms are detailed below.

Chronic Diarrhea: May cause nutritional and fluid-electrolyte imbalance disorders. The following nursing approaches are recommended for the management of this symptom:

- Low fiber diet recommendation: Consumption of low fiber foods may help control diarrhea by reducing bowel movements.
- Hydration provision: Patients should be encouraged to consume sufficient fluids to prevent fluid loss. Fluid supplements should be planned considering electrolyte balance.
- Fluid intake monitoring: Patients' daily fluid intake should be monitored to prevent dehydration.

Abdominal Pain: It can negatively affect the daily life activities of IBD patients. The recommended nursing approaches for the management of abdominal pain are as follows:

- Effective use of spasmolytic agents: In order to reduce intestinal spasms, spasmolytic drugs should be used in accordance with the doctor's recommendation.
- Hot applications: Using a hot water bag or hot compress can relieve pain by providing muscle relaxation.
- Relaxation techniques: The aim should be to reduce abdominal pain by reducing the patient's stress level with breathing exercises, meditation and other relaxation techniques.

Fatigue: Fatigue can cause a decrease in general energy levels and sleep disorders in IBD patients. Nursing approaches that can be applied to cope with fatigue are as follows;

- Recommending appropriate exercise programs: Light and regular exercises can reduce the feeling of fatigue by increasing energy.
- Sleep hygiene education: Regular sleep hours, providing a comfortable sleep environment and pre-sleep relaxation techniques should be aimed at improving sleep quality.
- Psychosocial support: Counseling services and social support should be provided to patients to cope with the psychological effects of feeling tired.

These approaches can be used effectively in managing the symptoms of IBD patients and can play an important role in improving their quality of life. It is recommended that nurses personalize their care plans by considering the individual needs of patients (11,15-17). Patient education aims to ensure that the individual is not only informed about his/her disease but also increases compliance with treatment, manages symptoms and improves quality of life (14).

Malnutrition is a common condition in IBD patients and regulation of nutritional habits has a critical place in disease management. Nurses should inform patients by creating individualized nutritional plans and follow nutritional support programs (12). Use of probiotics and prebiotics: Patient education should be provided on the effectiveness of probiotics and prebiotics that can reduce inflammation by maintaining the balance of intestinal microbiota (16). IBD is a disease that can negatively affect the psychological and social lives of patients.

Table 2. Use of Technology in Health Education and Its Benefits

Technology	Description	Benefits
Mobile Health Applications	Mobile applications developed for IBD patients provide support in symptom monitoring, medication management and diet (14).	☐ Facilitate patient follow-up, ☐ Increase treatment compliance, ☐ Support symptom management
Video-Assisted Education Programs	It helps patients to better understand the disease and participate consciously in treatment through educational videos, virtual reality simulations and webinars (15).	☐ Increasing patient education and awareness, ☐ Encouraging conscious participation in the treatment process
Tele-Health Services	It is a digital health approach that facilitates nurses' patient follow-up and offers remote health consultation and symptom management (16).	☐ Ensuring remote patient monitoring, ☐ Facilitating access to healthcare professionals, ☐ Increasing health literacy

Nurses should ensure that patients are educated on stress management, direct them to patient support groups and facilitate access to psychological counseling services (15). In addition to traditional patient education approaches, innovative methods such as mobile health applications, video-supported education programs, and virtual education platforms make patient education more accessible and effective, and the use and benefits of technology in health education for IBD patients are given in Table 2 (11).

CONCLUSION

In conclusion, the guidance role of nurses is a critical factor in improving the quality of life of IBD patients, and individualized care plans, psychosocial support services, and effective use of digital health solutions are important in this process. Future research should evaluate the long-term effects of nursing care plans, examine the effects of psychosocial support services on patients, and focus on educational programs to increase the integration of nurses into digital health systems.

DESCRIPTIONS

REFERENCES

1. Forbes A, Escher J, Hebuterne XH, et al. ESPEN guideline: Clinical nutrition in inflammatory bowel disease. Clin Nutr. 2017;36(2):321–347. doi:10.1016/j.clnu.2016.12.027.

2. Crohn's and Colitis Foundation of America (CCFA). The Facts About Inflammatory Bowel Diseases. Crohn's and Colitis Foundation of America; 2020. Accessed February 28, 2025. https://www.crohnscolitisfoundation.org/.

3. Akdemir N, Tosun N. Barsak hastalıkları ve hemşirelik bakımı. In: Akdemir N, Birol L, eds. İç Hastalıkları ve Hemşirelik Bakımı. 5th ed. Akademisyen Kitabevi; 2020:834–838.

4. Schmelzer M. Nursing management: Lower gastrointestinal problems. In: Williams LS, Hopper PD, eds. Understanding Medical-Surgical Nursing. F.A. Davis Company; 2015:981–982.

5. Dharni K, Singh A, Sharma S, et al. Trends of inflammatory bowel disease from the Global Burden of Disease Study (1990–2019). Indian J Gastroenterol. 2024; 43:188–198. doi:10.1007/s12664-023-01430-z.

6. Dağlı Ü. İnflamatuvar bağırsak hastalıklarının epidemiyolojisi ve risk faktörleri. In: Dağlı Ü, ed. Bağırsak Hastalıkları. Türk Gastroenteroloji Vakfı; 2008:15–20.

7. Tozun N, Atug O, Imeryuz N, et al. Clinical characteristics of inflammatory bowel disease in Turkey: A multicenter epidemiologic survey. J Clin Gastroenterol. 2009;43(1):51–57. doi:10.1097/MCG.0b013e3181574636.

8. Buran T. İnflamatuar barsak hastalığında epidemiyoloji, prevalans ve insidans. Turkiye Klinikleri Gastroenterohepatoloji - Özel Konular. 2017;10(1):15–17.

9. Akyüz F, Agargün BF, Atug O, et al. Epidemiological characteristics of inflammatory bowel diseases in the last decade: Multi-center Türkiye data. J Crohns Colitis. 2024;18(Supplement_1):i2025–i2027. doi:10.1093/ecco-jcc/jjad212.1261.

10. Torres J, Mehandru S, Colombel JF, Peyrin-Biroulet L. Crohn's disease. Lancet. 2017;389(10080):1741–1755. doi:10.1016/S0140-6736(16)31711-1.

11. Wu T, Cheng H, Zhuang J, Liu X, Ouyang Z, Qian R. Risk factors for inflammatory bowel disease: An umbrella review. Front Cell Infect Microbiol. 2025;14:1410506. doi:10.3389/fcimb.2024.1410506.

12. Kaplan GG. The global burden of IBD: From 2015 to 2025. Nat Rev Gastroenterol Hepatol. 2015;12(12):720–727. doi:10.1038/nrgastro.2015.150.

13. Jostins L, Ripke S, Weersma RK, et al. Host-microbe interactions have shaped the genetic architecture of inflammatory bowel disease. Nature. 2012;491(7422):119–124. doi:10.1038/nature11582.

14. Ng SC, Shi HY, Hamidi N, et al. Worldwide incidence and prevalence of inflammatory bowel disease in the 21st century: A systematic review of population-based studies. Lancet. 2017;390(10114):2769–2778. doi:10.1016/S0140-6736(17)32448-0.

15. Sudhakar P, Wellens J, Verstockt B, Ferrante M, Sabino J, Vermeire S. Holistic healthcare in inflammatory bowel disease: Time for patient-centric approaches? Gut. 2023;72(1):192–204. doi:10.1136/gutjnl-2022-328221.

16. Yan J, Wang L, Gu Y, Hou H, Liu T, Ding Y, Cao H. Dietary patterns and gut microbiota changes in inflammatory bowel disease: Current insights and future challenges. Nutrients. 2022;14(19):4003. doi:10.3390/nu14194003.

17. Özgürsoy Uran B. Güncel Kılavuz Önerileriyle İnflamatuar Barsak Hastalıklarında Semptom Yönetimi. Uludag Med J. 2020;46(1):101–111. doi:10.32708/uutfd.657842.

Pyelolithotomy In Pelvic Ectopic Kidney: Case Report

[iD] **Tayfun Çifteci[1]**

[1]Özel Davraz Yaşam Hospital, Urology Clinic, Isparta, Turkey

ABSTRACT

Introduction: Urinary system stone diseases are among the most common diseases in urology practice. Treatment methods are decided according to the size, location and number of the stone, but in rare diseases such as ectopic pelvic kidney, the decision must be made according to the kidney structure, vessels and stone. In this case report, the pyelolithotomy performed on the 29 mm stone of the patient with pelvic etopic kidney was tried to be explained in the light of the literature.

Case: A thirty-two-year-old male patient was diagnosed with a 29 mm stone in the right pelvic kidney and renal pelvis as a result of the examinations performed at the hospital where he complained of abdominal pain. With the subsequent examinations and preparations, the patient underwent a pyelolithotomy operation modified with appropriate steps for the pelvic kidney.

Discussion and Conclusion: ESWL, PNL, RIRS, laparoscopic surgery techniques can be applied in pelvic ectopic kidney. Studies have reported the success of ESWL as 54-81%, the success of PNL as 80%, and the success of laparoscopic and robotic surgeries as 80-100%. Although the success of minimally invasive methods is high, the stone burden is below two centimeters in most of these studies. Although open surgery seems to be the last choice, in this anomaly where the surgical technique is not fully determined and the approach is case-specific, open surgery should be considered and the technical approach and dissection steps should be determined.

Keywords: Pelvic Kidney, Ectopic Kidney, Pyelolithotomy, Kidney Stone.

INTRODUCTION

Urinary system stone diseases are common in our country and around the world (1). Its incidence in our country is around 15% (2). Medical expulsion therapies (MET), extracorporeal shock wave therapy (ESWL), ureterorenoscopy (URS), percutaneous nephrolithotomy (PNL),Retrograde intrarenal surgery (RIRS), open and laparoscopic surgeries are stone treatment methods used in daily practice (3).

Renal anomalies can be seen as agenesis, dysgenesis, ectopy and calyceal disorders (4). Renal ectopia is one of the relatively common anomalies. It is seen approximately once in three thousand births (5). It is more common on the right side, in the pelvic region, and in male patients (5). In asymptomatic cases, renal ectopia is not intervened, but stones in this kidney, ureteropelvic junction stenosis and vesiculoureteral reflux are more common (6). The treatment approach for pelvic ectopic kidney is decided according to the kidney position, the condition of the artery and vein and aberrant artery-vein structures, and the proximity of the intra-abdominal organs.

Our aim in this case report is to present the pyelolithotomy technique in the rare pelvic ectopic kidney in the light of the literature.

CASE

A thirty-two-year-old male patient applied to an external center with a complaint of abdominal pain. In the ultrasonography and tomography examinations, it was determined that the right kidney was not in the lumbar region, but was in the pelvic region, and that there was a 29 mm stone filling the renal pelvis of the right kidney. (Picture 1.)

Subsequently, the patient underwent contrast-enhanced tomography and it was determined that the pelvic ectopic kidney received branches from the right iliac artery and vein. It was observed that these branches crossed the surface of the kidney and entered the renal pelvis, and also the ureteropelvic junction had a high entrance. (Picture 2.)

Picture 1. View of the Right Pelvic Ectopic Kidney and Stone
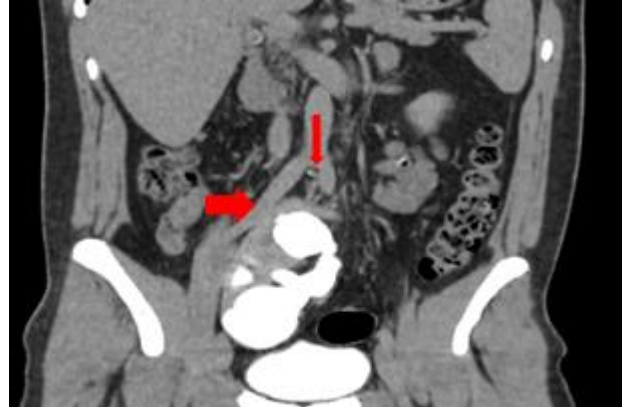
Picture 2. Right Pelvic Ectopic Kidney And İliac Artery-Vein Neighborhood

After the necessary preparations were made, an incision of approximately 10 cm was made 1 cm below the umbilicus, with the patient in the supine position, and the skin and its layers were passed and the abdomen was descended. Due to hydronephrosis, the kidney was manually palpated in the abdomen and the posterior leaf of the peritoneum was dissected over the kidney and dropped into the retroperitoneal space. The renal hilus was palpated, and then the renal pelvis was visualized by fine dissection. Then, a 2 cm incision was made on the renal pelvis and the stone was extracted. Afterwards, the renal pelvis was sutured with 4/0 Vicryl. After bleeding control, a drain was placed and the procedure was terminated. During surgery, the position of the kidney, its vein-artery formation, its proximity to the anterior abdominal wall limits the surgery, and the pelvic kidney pushes the intestines and is far from the Tellt line; It was experienced that this situation facilitated dissection. The patient was discharged stone-free by removing a soft drain on the second postoperative day. (Picture 3.)

Picture 3. Stone-free Urinary System Radiograph on the 2nd Postoperative Day

DISCUSSION

Pelvic ectopic kidney is more common among anomalies. ESWL, RIRS, PNL, laparoscopic and open surgeries can be performed in this anomaly, which is usually unilateral. Studies have reported the success rate of ESWL in pelvic ectopic kidney as 54-81%. Stones broken with this technique are stones 1.4 cm and below (7).

With the widespread use of flexible URS, it has become easier to perform surgical procedures in different anatomical structures. In their series of 17 cases, Binbay et al. reported the success rate of RIRS as 70.8% (8). In another study conducted in our country, the success rate of RIRS was reported as 84%. The inability to reach the stone and the inability to pass fragmented stones due to their high UP placement stand out as the limiting factors of this series (9).

PNL can be difficult in a pelvic-located kidney due to the position of the intestine and main arteries and kidney rotation, but there are series performed with ultrasound and laparoscopy guidance. In a study of

16 patients conducted by Desai et al., it was reported that ileus, hematoma and intestinal injuries were common (10).

Laparoscopic pyelolithotomy or robot-assisted pyelolithotomy are also among the widely used methods recently. Stone-free rates in these methods are reported to be between 80-100% (11).

Ectopic kidneys are cases with malrotation, short ureters, and their vascularity and proximity to surrounding tissues need to be examined. Although endoscopic and laparoscopic procedures provide advantages in terms of comfort in this type of surgery, the surgeon should keep in mind that any complications during the bleeding control and dissection stages cannot be handled as comfortably as the ease of access in open surgery.

CONCLUSION

In pelvic ectopic kidneys, for stones less than two cm in size, the approach is ESWL and RIRS, while for stones larger than two cm, laparoscopy and PNL are preferred. Although open surgery seems to be the last choice, in this anomaly where the surgical technique is not fully determined and the approach is case-specific, open surgery should be considered and the technical approach and dissection steps should be determined.

DESCRIPTIONS

No financial support.

No conflict of interest.

Note: The summary of this case report was presented as an oral presentation at the 3rd International Health Services Congress of Süleyman Demirel University.

REFERENCES

1. Stamatelou KK, Francis ME, Jones CA, Nyberg LM, Curhan GC. Time trends in reported prevalence of kidney stones in the United States:1976-1994. KidneyInt. 2003; 63: 1817-1823.

2. Akinci M, Esen T, Tellaloğlu S. Urinary stone disease in Turkey: an update depidemiological study. EurUrol. 1991; 20: 200-203.

3. Matlaga BR, Kim SC, Watkins SL, et al: Percutaneous nephrolithotomy for ectopic kidneys: Over, around, or through. Urology. 2006; 67: 513-517.

4. Gross AJ, Fisher M: Management of stones in patients with anomalously sited kidneys. Curr Opin Urol. 2006; 16: 100-105.

5. Goel R, Yadav R, Gupta NP, Aron M: Laparoscopic assisted percutaneous nephrolithotomy (PCNL) in ectopic kidneys: Two different techniques. Int Urol Nephrol. 2006; 38:75-78

6. Collura G, De Dominicis M, Patricolo M, et al. Hydronephrosis due tomalrotation in a pelvic ectopic kidney with vascular anomalies. Urol Int. 2004;72:349-351.

7. Tunc L, Tokgoz H, Tan MO, et al: Stones in anomalous kidneys: Results of treatment by shock wave lithotripsy in 150 patients. Int J Urol. 2004; 11: 831-836.

8. Binbay M, Skolarikos A, Unsal A, et al. Outcomes of retrograde intrarenal lithotripsy in pelvic kidneys. J Endourology. 2012; 20(Suppl):A154.

9. Bozkurt OF, Tepeler A, Sninsky B, et al. Flexible ureterorenoscopy for the treatment of kidney stone within pelvic ectopic kidney. Urology. 2014 84:1285-1289.

10. Desai MR, Jasani A: Percutaneous nephrolithotripsy in ectopic kidneys. J Endourol. 2002; 16: 655-657.

11. Ramakumar S, Lancini V, Chan DY, Parsons JK, Kavoussi LR, Jarrett TW. Laparoscopic pyeloplasty with concomitant pyelolithotomy. J Urol. 2002; 167:1378-1380.

A Rare Complication: Removing the Guide Wire Pieces Remaining in the Calyx After Nephrostomy by Retrograde Ureterorenoscopy

iD Tayfun Çifteci[1]

[1]Özel Davraz Yaşam Hospital, Urology Clinic, Isparta, Turkey

ABSTRACT

Introduction: Ureterorenoscopy is a frequently applied technique in stone surgery, and its complications are rare with the development of endoscopic materials. In cases where progress cannot be made through the ureter, antegrade interventions or a catheter must be inserted. In this case, we tried to explain the management and removal of the guidewire pieces that could not be performed with URS and remained in the calyx during the insertion of the nephrostomy catheter.

Case: In a 64-year-old patient who applied to the external center with the complaint of left flank pain, a left ureteral stone was detected, then URS was performed and the stone could not be reached due to proximal ureteral cyst. Subsequently, a nephrostomy catheter was inserted. The patient then underwent flexible URS and guidewire fragments were seen. An annual DJ catheter was applied and then the patient was passed through the dilated ureter with a rigid URS and the existing guyite pieces were removed.

Discussion and Conclusion: Ureteric strictures are rare complications with a rate of 9% and improvements. It usually does not require additional intervention, but rare and challenging situations may occur, as in our case. Complications such as failure to enter the collecting system, bleeding, and infection may also occur during percutaneous nephrostomy. In this type of URS cases, the limits of endoscopic interventions should be taken into consideration and contrast-enhanced images revealing the anatomy should be taken.

Keywords: Nephrostomy, Ureterorenoscopy, Flexible URS.

INTRODUCTION

Rigid and flexible ureterorenoscopy (URS) is a frequently applied surgical technique in urological stone surgery, and with the development of endoscopic materials, especially flexible URS has become more widely used. Although URS is frequently used today, different surgical procedures or open surgeries come to the fore in cases such as ureteral stenosis, large stones, and impaired kidney function. Although rare, complications such as ureteral avulsion, stricture, lack of access, infection, bleeding, and ureteral obstruction are also observed in the URS method. Difficult access ureteric stenosis, which is one of the intraoperative complications, occurs in cases such as external pressure on the ureter, anatomical structure of the ureter, impacted calculus and edema. In cases where passage or progression to the ureter cannot be achieved, passive dilation of the ureter with double j (DJ) and provision of renal drainage are frequently preferred complication management. In cases where the DJ catheter cannot be placed and there is advanced hydronephrosis, nephrostomy placement and urinary drainage are considered(1).

In our case, we aimed to explain the extraction of guide pieces in the renal pelvis and complication management in our case, where URS was planned due to ureteric stone, but could not be performed due to proximal ureteral stenosis, nephrostomy was placed, and the subsequent extraction of guide pieces in the renal pelvis

CASE

A 64-year-old female patient was did for URS at an external center due to left flank pain and a 12 mm stone in the left proximal ureter a year ago. Since there was a king in the ureter and it could not be passed, a left nephrostomy catheter was inserted into the patient and antegrade pyelography was taken (Picture 1.)

Picture 1. nephrostomy and antergade pyelograhy

Subsequently, a second operation was planned and a DJ catheter was placed in the patient, but since the stone could not be extracted, open ureterolithotomy and pyeloplasty were recommended. Three months ago, the patient did not accept the recommended treatment and after that applied to us. The operation was planned after obtaining the necessary consent and permissions from the patient. The patient's DJ catheter was removed and diagnostic URS was performed. The existing stenosis line was passed with a flexible URS and the inside of the kidney was seen. All calyces were examined, but no stones were found. In the upper and middle calyx group, 3 separate pieces of guide wires compatible with the guyt outer sheath were seen, and bleeding with pus was also observed (Picture 2.)
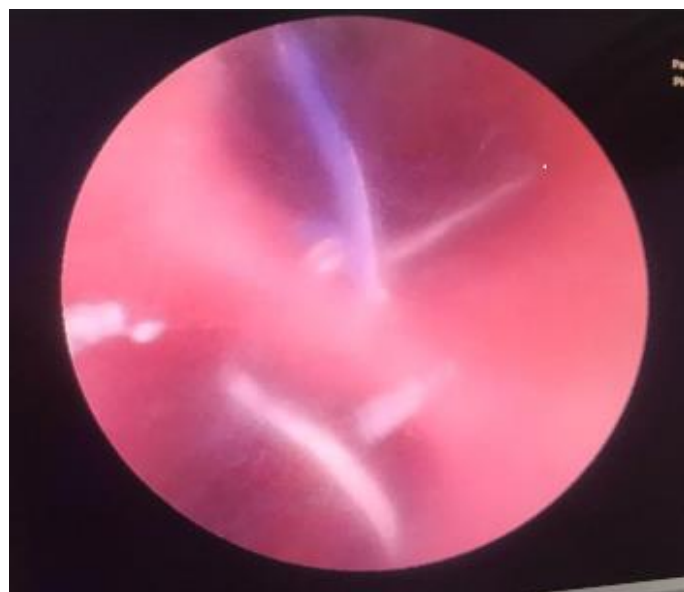
Picture 2. image of guide wire inside the kidney

A piece of guide was removed with the help of a flexible basket, but it was observed that 2 pieces were stuck in the mucosa and therefore the strength of the basket was not sufficient. An annual DJ catheter was placed in the patient and antibiotic treatment was started in accordance with the results of the pus culture.   The patient was re-operated on the 6th postoperative month. DJ was removed and it was observed that the existing proximal ureteric stricture was dilated. With the help of rigid URS, the renal pelvis was ascended and the guide wire in the upper calyx group was extracted with foreign body forceps.

DISCUSSION

URS is perhaps one of the most commonly used surgical procedures in urology practice. Its frequency is increasing day by day with the development of thin ureteroscopes and lasers.

Although there is no standard classification, URS complications can be divided into major and minor depending on whether they require additional surgical intervention or not (2). Ureteral avulsion and intussusception are major intraoperative complications (3). Wrong passage, abrasions, ureter perforations, extravasation and equipment malfunctions constitute minor intraoperative complications (4). Apart from this, bleeding, infection, lack of access, Steinstrasse, vesiculoureteral reflux and ureteral obstructions constitute postoperative complications (5). Bleeding, failure to enter the renal collecting system, extravasation and infection are among the possible complications of percutaneous nephrostomy placement.

Undoubtedly, ureteral avulsion is the most serious and feared complication of URS. With the development of more advanced equipment and increasing experience, it is almost not seen (4). It often occurs in the proximal ureter, during the extraction of the stone from the ureter, or when the ureterorenoscope is forced to pass through narrow ureters (6).

Ureter perforation is the most common complication with an incidence rate of approximately 15% (7). With the thinning of renoscopes and the emergence of flexible URSs, this complication has gradually decreased. Perforation can usually be easily resolved by placing a double stent and waiting for a while longer.

Ureteric strictures and ureteral obstructions occur at a rate of approximately 9% and are often caused by impacted stones, mucosal edema, urethral king, or external pressure (8). Although ureteral stenosis and kings can be easily overcome with the development of flexible URS, difficulties in instrument passage may occur in rare cases, as in our case. In such cases, nephrostomy placement is important to ensure renal drainage.

CONCLUSION

In URS surgery, which is frequently used in daily practice, complications are at minimum levels with increasing experience and technological developments. In rare cases, difficult cases or patients requiring additional intervention are encountered. At this point, it is important to evaluate the cases in the preoperative period, to have contrast images that will reveal the anatomical structure, and to consider URS limits and complications.

DESCRIPTIONS

No financial support.

No conflict of interest.

REFERENCES

1. Guidelines Uo. European Association of Urology. 2020

2. D'Addessi A, Bassi P. Ureterorenoscopy: Avoiding and Managing the Complications. UrolInt. 2011;87:251–259

3. Grasso M: Complications of ureteropyeloscopy; in Taneja SS, Smith RB, Ehrlich RM (eds): Complications of Urologic Surgery,ed3.Philadelphia, Saunders. 2001,pp:268–276.

4. Huiman JL: Ureteroscopic injuries to the upper urinary tract. Urol Clin North Am. 1989;16:249–254.

5. Stoller ML, Wolf JS: Endoscopic ureteral injuries; in Mc-Aninch JW (ed): Traumatic and Reconstructive Urology. Philadelphia, Saunders. 1996;pp;199–211.

6. Orkin LA: Treatment of cystoscopic injuries; in Orkin LA (ed): Trauma to the Ureter: Pathogenesis and Management. Philadelphia, Davis. 1964,chap21.

7. Harmon WJ, Sershon PD, Blute ML, Patterson DE, Segura JW: Ureteroscopy: current practice and longterm complications. J Urol. 1997;157:28–32.

8. Abdel-Razzak OM, Bagley DH: Clinical experience with flexible ureteropyeloscopy. J Urol. 1992; 148: 1788– 1792.

Urge Urinary Incontinence: Case Report

Zehra Özdemir[1], Cemile Alaca[1]

[1]Ankara University, Ankara, Turkey

ABSTRACT

Urge incontinence is one of the most common types of incontinence in women. Urge incontinence is described as a sudden feeling of urge to urinate and a strong urge to urinate. It usually occurs due to overactivity of the detrusor muscle. The associated risk factors such as age, frequent urination, obesity and mode of delivery were found to be compatible with the literature. The aim of this case report is to present the current status, risk factors and causes of urge incontinence in an explanatory manner.

Keywords: Case Report, Nursing, Urinary Incontinence.

INTRODUCTION

In 1979, the International Continence Society (ICS) defined urinary incontinence (UI) as "involuntary expulsion of urine or inability to retain urine and an objectively provable social and hygienic problem" (1). In 2002, ICS defined UI as "involuntary urinary incontinence" and in its last report, it was redefined as "any complaint of urinary incontinence" (2,3). More than 500 million individuals in the world have incontinence problems and the majority of them are women (4,5). UI is a widespread public health problem affecting the quality of life in women, especially in physical, sexual, social and psychological aspects (6). The prevalence of UI in women varies from society to society. The prevalence of UI in women in our country varies between 21.3% and 80%. The most common types of UI in women are stress, mixed and urge incontinence (4,7). UI risk factors include age, gender, race, smoking, factors related to childbirth, chronic constipation, menopause, obesity, spinal cord injuries, neurological diseases, hysterectomy, pelvic organ prolapse (POP), caffeine consumption, medications, diabetes mellitus (DM), radiotherapy, urinary tract infection and genetic factors (8). Behavioural and nonpharmacological treatments, pharmacological treatments and surgical treatment methods are used in the treatment of UI. Nonpharmacological and behavioural treatment methods include lifestyle changes, bladder education and pelvic floor muscles exercises Lifestyle changes include recommendations for obese individuals to löse weight, change diet, decrease caffeine and excess fluid consumption if available (9). In order for women with incontinence to maintain a healthier and more comfortable life, it is among the obligations of nurses to diagnose and evaluate incontinence, prevent its progression and take an active role in the treatment process of patients. Nurses are required to evaluate all women in the community in terms of risk factors that may cause incontinence, to provide the necessary training to women and to raise awareness of women in incontinence risk factors, findings and protection from incontinence. In addition, nurses' use of their roles as educator, researcher, manager and collaborator enables them to make the care process more effective (10-14). In the case diagnosed with urge incontinence; the patient's current condition, risk factors and causes were presented in an explanatory manner in accordance with research and publication ethics.

CASE

Ethics committee permission was not obtained for the study and the data collection phase started after verbal and written consent (informed consent form) was obtained from the individual in question.

FS, 66 years old, widowed, primary school graduate, SSK health insurance, low income, longest lived in Central Anatolia. Age at marriage was 17, age at first pregnancy was 18, gravida was 7 and parity

was 7. All of the deliveries were vaginal deliveries with episiotomy, birth weight of the babies is unknown. FS's BMI was 36.51 and she was level II obese. The patient entered menopause naturally, has been in menopause for thirty years and has hypertension as an additional disease. She stated that she was not sexually active because she lost her husband. She uses Coversly 10 mg and Ecopirin 100 mg oral tablets. She does not use alcohol, does not smoke, has no drug and food allergies, no previous surgical operation. The patient has applied to the gynaecology outpatient clinic for a year because of a sudden feeling of tightness and strong urge to urinate and urine loss that occurs before reaching the toilet. She stated that this condition bothered her more and more every day and that she constantly changed her underwear and used pads. FS stated that she went to the toilet 8/9 times during the day and 2/3 times at night and slept for 9/10 hours on average. Since FS is a housewife, she spends her day at home, and when she goes out, she returns home in a short time with the thought that if she cannot hold her urine and cannot find a toilet outside. She stated that she often wanted to eat and drink something when she was at home and that she drank approximately 2 litres of water, 4 cups of tea and 1 cup of coffee during the day. The patient stated that his brother had childhood enuresis in his family history. In the lower urinary system questioning, he stated that he had dysuria, nocturia, urgency, susprapubic pain-sensitivity and that he was relieved with urination. She stated that she had difficulty when she started to urinate, she needed to strain for urination, she could urinate with a change in position, she had a feeling of inability to empty the bladder, and she had drip-like urine after urination. When the symptoms of prolapse were questioned, it was found that there was a palpable mass/sagging sensation in the vagina, pelvic pressure sensation and low back pain. Among the urinary incontinence symptoms, she stated that she had urge incontinence 1/2 times a day in small amounts, enuresis 1 time a day in small amounts, and nocturnal enuresis 1 time a day in small amounts. The patient was waited to urinate for urogenital system examination, the patient drank 500 ml of water, the last urination was 3 hours before the examination. The patient was taken to the examination table when he was fully congested, there was no urinary incontinence since the last urination, cough test was negative, uroflow volume was 360 ml, Qmax was 39 ml/sec, voiding time was 20 s, voiding type was bell, stress test with empty bladder was negative, urine residual amount with catheter was 10 ml, Qtip test >300, chyloral reflex is present, anal reflex is present, stage III anterior on speculum examination, suspicion of fistula stage II posterior, muscle strength 3/5 with digital palpation. Urine tests; Density 102. LES was negative, nitrite was negative, and there was no growth in urine culture. The patient underwent urodynamics in the urodynamics room of the urogynaecology service, the procedure lasted 1 hour 49 minutes, the number of urgency was 5, the number of incontinence was 11, the weight before the pad test was 20 g, the weight after the test was 37 g, the number of DAA was not monitored, the uroflow volume was 375, and the residue after uroflow was 25 ml. The patient stated that she thought that urinary incontinence was shameful and that it was a normal condition with age and that she could not share this situation with her relatives and that she had not consulted a doctor for a year. She said that this situation caused her to be introverted and stressed. As a result of anamnesis, laboratory findings and physical examination, urge incontinence was diagnosed. The patient was told to come to the examination again after two weeks. During this two-week period, she was asked to keep a bladder diary and practice pelvic floor exercises (information about bladder diary and pelvic floor exercises was given).

DISCUSSION

Incontinence risk factors such as age, birth-related factors, BMI, menopause and hypertension were present in the case. When the symptoms of the case were analysed, urge incontinence was diagnosed because the patient could not reach the toilet with sudden feeling of urge and strong urge to urinate. The amount of urine missed by women with urge incontinence is higher than in women with other urinary incontinence diagnoses. In the literature, it has been reported that urge incontinence is more common in elderly individuals (15). The age of the patient supports this information. Urinary incontinence may be observed due to reasons such as urinating 8 times a day or more, urinating at night, and inability to prevent urination (16-19). The patient stated that she urinated 10/12 times a day. Obesity, which causes an increase in intraabdominal and intravesical pressure, is an important risk factor for urinary incontinence, especially for stress and urge urinary incontinence (20-23). It was found that the BMI of the patient was high and level II. In previous studies, urge incontinence is observed more in obese women and this supports the result of this case (24-25). Urge incontinence is more common in women

who have vaginal delivery, especially in women who have episiotomy (19). Vaginal delivery and episiotomy application in the case supports this information. In studies, it has been reported that the majority of women with urinary incontinence do not apply to health institutions or apply late because of embarrassment and considering it as a normal condition due to age. Similarly, in our case she presented late because she thought urinary incontinence was shameful and normal with age.

CONCLUSION

In conclusion, the urge incontinence risk factors determined in the case were found to be compatible with the literature. The fact that the patient thought that urinary incontinence was shameful shows that urinary incontinence is an important health problem. It is among the obligations of nurses to take an active role in the diagnosis, evaluation, prevention and treatment of incontinence in order for women with incontinence to lead a healthier and more comfortable life. Nurses are required to evaluate women in terms of risk factors that may cause incontinence, give necessary trainings to women about incontinence risk factors, findings and protection from incontinence and raise awareness of women.

DESCRIPTIONS

No financial support.

No conflict of interest.

REFERENCES

1. Abrams P, Blavias JG, Stanton S, Andersen JT. ICS Standardization of Terminology of Lower Urinary Tract Function. Neurourol Urodyn. 1998; 114: 5-19.

2. Abrams P, Cardozo L, Fall M, Griffiths D. ICS Standardisation of Terminology of Lower Urinary Tract Function. Neurourology and Urodynamics. 2002; 21: 167-178.

3. Ateş A, Özengin N, Bakar Y. Pelvic Floor According to Urinary Incontinence Type Comparison of Muscle Strength and Quality of Life: Retrospective Study. Turkey Journal of Health Sciences. 2019; 4(2): 147-154.

4. Milson I, Gyhagen M. The Prevalence of Urinary Incontinence. a Department of Obstetrics & Gynaecology, Sahlgrenska Academy at Gothenburg University, Gothenburg, Sweden, 2019.

5. Norton P, Brubaker L. Urinary Incontinence in Women. Lancet. 2006; 367: 57-67.

6. Sahin NH. Structural Problems of Reproductive Organs. Beji NK (ed.). Book of Women's Health and Diseases for Nurses. 2017; (133-140. pp.) Istanbul, Nobel Medical Bookstore.

7. Zeren Öztürk, G., Toprak, D., Basa, E. Urinary tract in women over 35 years of age Incontinence frequency and evaluation of the factors affecting it. Sisli Etfal Hospital Medicine Bulletin. 2012; 46(4), 170-176.

8. Markland AD, Vaughan CP, Johson TM, Burgio KL, Goode PS. Incontinence. Rewiew Med Clin North. 2011; 95(3): 539-554.

9. Oztas S. Urinary Incontinence. In: Cakmak BD, editor. Practical Information in Gynaecology. Lyon: Livre de Lyon. 2020; p. 221-238.

10. Ertem G. Ways of Coping with the Disease of Patients with Urinary Incontinence An Investigation. International Journal of Human Sciences. 2009; 6: 176-87.

11. Kök G, Şenel N, Akyüz A. GATA Gynaecology Outpatient Clinic Patients Aged 20 Years Awareness Status of Older Women in Terms of Urinary Incontinence Evaluation. Gülhane Medical Journal. 2006; 48: 132-136.

12. Şen E. Urinary Incontinence Prevention and Treatment in Women Non-Surgical Methods. Journal of Continuing Medical Education. 2011; 20: 7-13.

13. Wells M. The Role of the Nurse in Urinary Incontinence. Baillieres Best Pract Res Cli Obstet Gynaecol. 2000; 14(2): 335-353.

14. Yücel U, Hadımlı A, Koçak YÇ, Ekşioğlu AB, Sarı D, Saydam BK. Prevalence of Urinary Incontinence in Women Aged 20 Years and Older Living in Bornova Risk Factors. Journal of Health Sciences and Professions. 2018; 5(3): 414-423.

15. Abrams, P., Cardozo, L., Khoury, S., & Wein, A. Third international consultation on incontinence. International Continence Society. Monte Carlo: Monaco. 2005; 26-29.

16. Tanagho AE, McAninch WJ. Smith's General Urology. Fourteenth Ed. America: Simon&Schuster Company. 1995; 536-550.

17. Demir Ü, Saruhan A. Hormone replacement therapy on menopausal complaints effects of women's studies on women. IV. National Women's Studies Meeting. Women's Issues Methods, Strategies and Policies Towards its Solution; September 1998; Ege University, Izmir; 265-269.

18. Alpay H, Bıyıklı KN. Voiding disorders. Türk Nefr Diyal ve Transp Derg. 2003; 12(3): 122- 126.

19. Sivaslıoğlu, A.A. Practical Urogynecology. Izmir, Modern Medicine Bookstore, 2011.

20. Jackson SL, Scholes D, Boyko EJ, Abraham L, Fihn SD. Urinary incontinence and diabetes in postmenopausal women. Diabetes Care. 2005;28(7):1730-8. doi: 10.2337/diacare.28.7.1730.

21. Brown ADG, Tara KC. Gynecological disorders. In: Tallis R, Fillit HM, Brocklehurst JC, ed(s) Brocklehurst's Textbook of Geriatric Medicine and Gerontology. 6 th ed. Philadel- phia, USA: Churchill Livingstone. 2006; 1135-1144.

22. İzci Y, Topsever P, Filiz M, Dede Çınar N, Uludağ C, Janssen TL. The association between diabetes mellitus and urinary incontinence in adult women. Int Urogynecol J. 2009; 20:947-952

23. Aslan, E., Beji, N.K. Erkan, H.A. Yalçın, O. Güngör, F. Urinary Incontinence and Quality of Life of the Elderly Residing in Residential Homes in Turkey'', Arch Gerontol Geriatr. 2009; 49: 304-310.

24. Gök S. The effect of urinary symptoms and incontinence on quality of life in diabetic women (Master's Thesis). Istanbul, Istanbul University, 2016.

25. Özer, N. E. & Dinç, A. Urinary Urinary Disorders in Women in Premenopause and Menopausal Period Investigation of Incontinence Prevalence and Risk Factors. Gumushane University Health Journal of Sciences. 2019; 8 (2): 1-9.

COVID-19-Associated Pneumothorax: Radiological Insights and Inflammatory Markers

Korhan Kollu[1]

[1]Department of Internal Medicine, Division of Intensive Care, University of Health Sciences, Konya City Hospital, Konya, Turkey

Dear Editor,

I read with interest the article by Kılıç et al. (1). "Retrospective Analysis of Spontaneous Pneumothorax Cases Associated with COVID-19" was published in the 3/2024 issue of the journal. Congratulations to the authors for this article.

Recent literature indeed confirms a link between COVID-19 infection and spontaneous pneumothorax, although it remains a rare occurrence. Several studies have reported that spontaneous pneumothorax occurs in roughly 1% of hospitalized COVID-19 patients, rising to about 3% among those with COVID-19 pneumonia, and up to 6% in patients requiring mechanical ventilation (2). These figures underscore that while the complication is infrequent overall, certain high-risk subsets (such as critically ill or ventilated patients) experience it more commonly. Thus, clinicians should be vigilant for spontaneous pneumothorax in COVID-19, especially in those with severe pulmonary involvement.

Kılıç et al. retrospectively analyzed 31 COVID-19 patients who developed spontaneous pneumothorax, providing valuable insight into their clinical outcomes. Consistent with other reports, the authors found a high mortality rate among these patients – 11 out of 31 (35%) in-hospital mortality in their series. This figure is in line with prior cohort studies which have reported mortality ranging from roughly 27% up to over 50% in COVID-19 patients with pneumothorax (2,3). One of the study's strengths is its use of CO-RADS scoring. Notably, 63.6% of fatal cases were classified as CO-RADS-5, whereas only 20% of discharged patients fell into this category. This supports previous studies reporting an association between high CO-RADS scores and increased mortality in COVID-19 (4). However, the study did not provide details on specific radiological findings that may contribute to pneumothorax development, such as bulla formation, cavitation, and air trapping. Conversely, Ershadi et al. identified bulla presence as a significant prognostic factor (2).

Kılıç et al. also report significantly divergent levels of hemoglobin, platelet count, INR, and D-dimer between the discharged patients and those who died (1). This observation is an important contribution, as it suggests that more severe systemic inflammation and coagulopathy may accompany or predispose to poor outcomes in COVID-19 patients with pneumothorax. Nonetheless, gender and the Charlson Comorbidity Index, both identified in previous studies as risk factors for COVID-19-related pneumothorax (5,6), were not analyzed in the study by Kılıç et al. Among inflammatory markers, the Systemic Immune-Inflammation Index (SII) is considered superior to PLR and NLR in assessing disease severity and mortality risk in COVID-19 and other inflammatory disorders (7).

In conclusion, COVID-19-induced widespread lung damage can predispose patients to pneumothorax, a complication associated with high mortality rates. Therefore, in cases of sudden clinical deterioration in COVID-19 patients, the possibility of pneumothorax should be carefully considered, and radiological evaluations and anticoagulation interventions should be promptly initiated. Moreover, the use of more comprehensive anticoagulation and inflammatory indices such as SII may aid in identifying high-risk patient groups and optimizing treatment strategies.

DESCRIPTIONS

No financial support.

No conflict of interest.

REFERENCES

1. Kılıç Ş, Çatal F, Kaner M. Retrospective Analysis of Spontaneous Pneumothorax Cases Associated with COVID-19. Acta Medica Ruha. 2024;2(3):139-145. doi:10.5281/zenodo.13340894

2. Ershadi R, Rafieian S, Salehi M, et al. COVID-19 and spontaneous pneumothorax: a survival analysis. J Cardiothorac Surg. 2023;18(1):211. doi:10.1186/s13019-023-02331-0.

3. Honore PM, Redant S, Preseau T, et al. Spontaneous Pneumothorax (SP) in COVID-19 Is Associated With Worse Outcomes Than SP in Non-COVID-19 Patients, Which Suggests That SP in COVID-19 is a Sign of Disease Severity: Is This Finding a Pure Association or Is There Really a Strong Relationship Between the Two? Chest. 2021;160(1):e88-e89. doi:10.1016/j.chest.2021.02.057.

4. Çoraplı G, Tekin V. Evaluation of Patients Who Developed Pneumothorax Due to COVID-19. Diagnostics (Basel). 2022;12(9):2140. doi: 10.3390/diagnostics12092140.

5. Inanc IH, Bursa N, Gultepe A, et al. Association among CO-RADS score, co-morbid diseases, and short-term prognosis in COVID-19 infection. Eur Rev Med Pharmacol Sci. 2022 Jan;26(2):653-663. doi: 10.26355/eurrev_202201_27892.

6. Song MJ, Kang M, Song KH, et al. Comparison of the risk of pneumothorax in COVID-19 and seasonal influenza. Sci Rep. 2024;14(1):21077. doi:10.1038/s41598-024-69266-x.

7. Zinellu A, Scano V, Masotto E, et al. The systemic inflammation index on admission is independently associated with length of stay in hospitalized COVID-19 patients. Minerva Respir Med. 2021; 60(3):65-72. doi:10.23736/s2784-8477.21.01932-5.