IJHSRP

INTERNATIONAL JOURNAL OF HEALTH SERVICES RESEARCH AND POLICY

2022
Volume 7
Issue 1

e-ISSN: 2602-3482

Publisher of Journal: *Rojan GÜMÜŞ*

Email (for orders and customer services enquiries): zulkufgulsun@gmail.com

Visit our home page on http://dergipark.org.tr/tr/pub/ijhsrp

IJHSRP

International Journal of Health Services Research and Policy

www.dergipark.org.tr/ijhsrp

Volume 7 Issue 1

April, 2022

e-ISSN: 2602-3482

CONTENTS

Research Articles

International Journal of Health Services Research and Policy
www.dergipark.org.tr/ijhsrp

IJHSRP

e-ISSN: 2602-3482

Research Article

EVALUATION OF THE SOCIAL MOBILIZATION COMPONENT OF THE SECOND YEAR OF LIFE (2YL) PROJECT ON IMMUNIZATION COVERAGE IN ADAKLU DISTRICT, GHANA

***Justice Kwesi BAAH*[1] *Justice NONVIGNON*[1] *Moses AIKINS*[1]**
Genevieve C. ARYEETEY*[1]

[1]School of Public Health, College of Health Science, University of Ghana
*Corresponding author: gcaryeetey@ug.edu.gh

Abstract: *Ghana has had relatively high immunization coverage of more than 85% for infant antigens in the first year of life. However, there is a decline in immunization coverage for vaccines provided during the second year of life (2YL) of the child. As part of the 2YL project implemented in Ghana to strengthen the 2YL immunization platform, social mobilization strategies were utilized to help improve coverage for vaccines provided in the 2YL of a child. This study aims to evaluate the impact of social mobilization components of the 2YL project on immunization coverage in Adaklu district, Volta region, Ghana. In a pre-experimental design; a single-group pretest-posttest design was utilized to assess whether there was a significant change in immunization coverage pre-and post-intervention. Data on health facilities' immunization coverage were collected from DHMIS II (District Health Management Information System) before, during, and after the intervention. The Pearson chi-square, fisher's exact, Wilcoxon sign rank test, and paired t-test were used to evaluate the impact of the intervention implemented in 2017 on identified outcomes mainly Penta3, MR1, MR2, and MenA. The results indicated a significant improvement in the dropout rate between the first and second dose of Measles-Rubella vaccines in health facilities within the district. The number of health facilities that recorded a negative rate increased to 70% in 2018 from 25% in 2016. Also, the annual district immunization coverage for the Second dose of Measles (MR2) increased from 73% in 2016 to 84% in 2017 and 82.5% in 2018. In addition, Penta 3 coverage increased from 90.6% in 2016 to 100 plus % in 2017. The implementation of the social mobilization had a positive effect on immunization coverage in the district. The intervention resulted in increased immunization coverage and significantly reduced the measles Rubella dropout rate.*

Keywords: *Immunization coverage, Social mobilization, Second Year of life (2YL), Evaluation*

Received: October 22, 2021 *Accepted: March 30, 2022*

1. Introduction

Children under five years are most vulnerable to Vaccine-Preventable Diseases (VPD) which are major causes of morbidity and mortality in the world. Studies have shown that about 2.5 million annual global child mortality is attributable to vaccine-preventable diseases [1]. According to the European Public Health Alliance, widespread immunization introduced in the 1950s significantly reduced the prevalence and incidence of these diseases. Empirical data indicate that in Europe alone, 28,500 children were paralysed every year between 1951 and 1955 due to polio, however with the introduction of mass immunization, the polio disease was eliminated completely by 2002 [2]. Currently, polio in its wide form is recorded in only three of the world's countries namely; Nigeria, Afghanistan, and Pakistan [3].

Ghana has had relatively high immunization coverage of more than 85% for infant antigens and has been a leader in vaccine introduction in the African Region [4]. Ghana was one of the first countries to introduce the pentavalent vaccine in 2002, pneumococcal Conjugate Vaccine (PCV), rotavirus vaccine, and a second dose of Measles-Rubella (MR2) (first non-infant vaccine) on its immunization schedule in 2012 [4]. Prior studies have demonstrated that Ghana has achieved significant success in immunization, observing an increase from 69% in 1988 to 89.9% in 2014 using the third dose of the Penta valence (Penta3) vaccine as a proxy [5]. However, the biggest challenge is sustaining the gains made, because there is an indication of stagnation of national immunization coverage. There are significant disparities that exist in the national figures of immunization coverage which are associated with differences in urban/rural place of residence, wealth and education status, gender, and remoteness. For instance, according to the Ghana Health Service report, in 2014 about 69% of 216 districts in Ghana achieved 80% and above for the third dose of Penta3 vaccine and the remaining districts fell short of the 80% target [6]. The stagnated immunization coverage in Ghana is also seen in vaccines specifically delivered in the second year of life (2YL) of the child. Irrespective of the efforts that were put in at the introduction of the second dose of the Measles-Rubella (MR2) vaccine in 2012, coverage remains below 70% [4].

Further, caregivers have become accustomed to a single routine dose of the Measles-Rubella (MR1) vaccine. Many caregivers were unaware of the need for a second dose of Measles-Rubella (MR2), did not know the recommended age for the vaccine, or did not see MR2 as equally important as vaccines in the child's first year of life [4]. These reasons have led to a dropout rate greater than 10% in three regions (Northern Region: 32%, Volta Region: 14%, Greater Accra Region: 31%) that were part of the study. This implies that there is a needed shift in messaging to caregivers from public health professionals to cause a behavior change among caregivers [4].

To help address the challenges to improve and sustain high immunization coverage for MR2 and to strengthen the 2YL service delivery, the Centers for Disease Control and Prevention (CDC) supported the implementation of the second year of life (2YL) project. The 2YL was to help identify and address health facility and community level barriers contributing to low MR2 coverage.

The CDC in collaboration with Ghana Health Service partnered with Civil Society Organizations (CSOs) to embark on social mobilization in selected districts in Ghana. Social mobilization and community participation have been identified as key in immunization provision and other health service provisions in communities. Similar studies have assessed an urban slum immunization intervention that had a social mobilization component. The study used the pre-posttest design and found improvement in immunization coverage - 33% drop-out rate at baseline reduced to 1% drop-out after the intervention [7]. Likewise, a study in India on urban immunization outreach intervention which included social mobilization was assessed and found 100% improvement in all primary vaccines of the Universal Immunization Program. The study concluded that with fully planned strategies, it is possible to quickly improve immunization coverage through opportunities beyond the regular health system [8]. Monitoring of routine immunization data indicated that about 64% of children missed routine immunization as a result of insufficient information or understanding of immunization. However, through social mobilization strategies, these missed out children were reached and immunized [9]. Another study on immunization coverage in Nigeria found that immunization coverage in rural communities was higher compared in urban areas. This was attributed to better mobilization and participation in the delivery of immunization services in rural communities [10].

In immunization literature, many of the studies focus on estimating the coverage and factors that influence immunization performance. However, immunization performances are mainly influenced by some form of interventions that have been put in place to ensure performance is improved. However, studies that evaluate the contribution of social mobilization to immunization performance is limited in

the literature. Therefore, this study employs a statistical approach to evaluate the social mobilization components of the 2YL project on immunization coverage in Adaklu district of the Volta Region, Ghana. In the Adaklu district, immunization coverage before 2016 was low. Quarterly Penta 3 coverage in the district was less than 30% before 2016. This was similar to other vaccines including Measles-Rubella. Immunization coverage in the district improved from 2016 such that in the first quarter, Penta 3 coverage was 100% and that of Measles-Rubella was 65% [11]. The objectives of the study were to; evaluate the difference in immunization coverage in the district before, during, and after the social mobilization intervention and assess the difference in dropout rate between MR1 and MR2 before, during, and after social mobilization intervention.

1.1. The social mobilization intervention

The social mobilization intervention was part of a larger second-year life (2YL) intervention implemented in Ghana to strengthen the second-year of life platform. The larger 2YL project had a focus on six components namely; Program Integration, VPD Surveillance, Special innovations to reach the unreached, training and supervision data recording and reporting, and social mobilization. Except for the Social mobilization component that was implemented in targeted districts, the other five components were national in nature.

The social mobilization intervention was implemented in 2017 with activities including 2YL communication messages (which went through the drafting stage, pre-testing, and validation stages), production of 2YL jingles, training of frontline health workers in different topical areas on social mobilization, engagement of stakeholders, and media lunch of the 2YL campaign. The community-based activities namely; community durbars, church/mosque outreaches, market/lorry station outreaches, radio/information center and/or mobile van education, community video shows, door-to-door sensitization, defaulter tracing and referrals, etc. were to raise awareness and demand for 2YL services was implemented between September and December 2017.

Civil Society Organizations (CSOs) were an integral part of the social mobilization component of CDC 2YL immunization project. CSOs were charged to engage communities and local actors through social mobilization strategies to raise community awareness on vaccination services (MR2 and MenA vaccines) provided during a child's 2YL and to promote awareness of other services provided during the 2YL including catch up vaccination, growth monitoring, bed-net distribution, and vitamin A supplementation.

For the purpose of this evaluation, social mobilization as a variable is categorized as before intervention – that is the year 2016 where there was no 2YL social mobilization, during the intervention – that is the year 2017 where social mobilization activities were carried out in the Adaklu district and After intervention – the year 2018. Data on coverage and dropout rate will be compared across the years to identify any statistical differences.

2. Materials and Methods

2.1. Study design

The study used the single group pre and post-test design to evaluate the outcome of social mobilization on immunization coverage. This design allows a single group to be observed before and after an intervention presumed to influence a change. The single-group pretest-posttest is used such that a single group (for this study Health facilities in the district) can be observed at two points in time – before and after an intervention. This design allows for changes in outcome (immunization coverage) to be attributed to the social mobilization intervention.

2.2. Study area

The study was conducted in Adaklu district of the Volta Region of Ghana. Adaklu district is one of the 25 Administrative districts in the Volta Region. The District capital is located at Adaklu Waya. The District Health Directorate (DHD) is located at Tsrefe. Adaklu is bordered on the North and West by Ho Municipal, South by Central Tongu district, and to the East by Agortime-Ziope district. The economic activities in Adaklu District include farming 50% (the main crops grown in the area are yam, tomatoes, and maize), bee rearing 10%, livestock rearing 30%, and others 10%. The rest are formal sector workers and in construction. Based on the 2010 Population and Housing Census, Adaklu district as of 2018 had a total projected population of 43,311 with an estimated growth rate of 2.5% per annum and a national per capita income of USD 2260.8. The district has no district hospital to take care of the major health needs of the citizens in the district. However, the district has 20 health facilities (health centers (4) and Community-Bases Health Planning Services (CHPS) that offer preventive and promotive services (15) and 1 clinic, which is a mission facility. The district was reported as one of the low-performing districts on coverage for the second dose of measles-rubella and one of the districts with a high measles-rubella dropout rate [4].

2.3. Childhood immunization schedule in Ghana

The expanded program on Immunization (EPI) of the Ghana Health Service employs about four strategies namely; static, outreach, campaign, and Supplementary Immunization Activity (SIA) in the delivery of immunization service. The static and outreaches are strategies used in the delivery of routine immunization services throughout the year and follow Ghana's childhood immunization schedule (Table 1) while the campaigns and SIAs are periodic depending on the issues of public health concern in the country or in a particular locality within the country. During the static and outreach delivery of immunization services, data on the number of children immunized are captured into the DHMIS which is used to compute immunization coverage. The data used for the study covers static and outreach immunization service delivery recorded in the DHMIS for the years 2016, 2017, and 2018.

Table 1. Childhood Immunization Schedule in Ghana

Child's age	Vaccines required
At birth	BCG, OPV0, Hepatitis B
6 weeks	OPV1, DPT/HiB/HepB1, Rotavirus1, Pneumococcal 1
10 Weeks	OPV2, DPT/HiB/HepB2, Rotavirus2, Pneumococcal 2
14 weeks	OPV3, DPT/HiB/HepB3, Pneumococcal 3, Inactivated Polio vaccine (IPV)
6 months	Vitamin A
9 months	MR1, Yellow fever
12 months	Vitamin A
18 months	MR2, MenA

Source: Child welfare card, Ghana Health Service

Table 1 shows childhood immunization in Ghana starts at birth (age 0) until the child is 18 months. According to the immunization schedule, a child at the age of 18 months is expected to have been fully immunized with one dose of BCG, Hepatitis B, IPV, Yellow fever, and MenA; two doses of rotavirus and Measles-Rubella (MR); three doses of DPT/HiB/HepB and Pneumococcal; and four doses of Oral Polio Vaccine (OPV). However, children that mix any of the vaccines within the recommended period have the opportunity to take the vaccines until age five.

2.4. Study variables

2.4.1 Dependent variable

The study examined the outcome of social mobilization on two dependent variables namely,

***Immunization coverage*:**

Overall immunization coverage in the country is determined using Penta 3 as a proxy variable, although specific antigen coverages are also calculated. Immunization coverage was calculated per facility for antigens - penta3, MR1, MR2, and MenA. Immunization coverage was obtained as; (number of children immunized with specific antigen/Targeted population of children under-five)*100

***Measles-Rubella (MR) dropout rate*:**

For each health facility, the coverage for MR2 was deducted from the coverage of MR1, and based on WHO recommendation the difference should not be more than 10%, the difference was categorized as; >10 – high dropout rate; 6% - 10% - moderate dropout rate; 1% - 5% - low dropout rate; 0% - no dropout rate; and < 0% - negative dropout rate.

2.4.2 Independent variable

The independent variable for this study was the social mobilization intervention implemented in the Adaklu district.

The study assumed that all other factors that influence immunization coverage and dropout rate be constant before intervention and after the intervention. The only factor that changed was the implementation of 2YL social mobilization strategies in 2017.

2.5. Data source and collection approach

The study obtained data on health facility immunization coverage specifically on 2YL vaccines (MenA and MR2), the first dose of Measles-Rubella, and Penta3. Data on health facility immunization coverage was collected through the mining of existing administrative data in DHIMS into an excel template. Health facilities' recording of immunization coverage reported in the District Health Information Management System II (DHIMS II) before, during, and after the social mobilization intervention were extracted for analysis.

2.6. Data processing and management

Data obtained was cross-checked and edited to ensure consistency and accuracy. After data have been edited, it was coded and entered into the statistical analysis package, STATA IC version 16 for analysis.

2.7. Data analysis

The study employed descriptive and inferential analysis of data. Descriptive statistical analysis included the use of percentages presented in graphs to indicate the distribution and trend in immunization coverage over the period of 2016 to 2018. The inferential analysis essentially examined whether social mobilization influenced immunization coverage. The Pearson correlation was used to assess the outcome of the social mobilization on health facility dropout rate while paired t-test and Wilcoxon sign rank test was used to assess the outcome of the social mobilization on immunization coverage. The fisher's exact test was used for sensitivity analysis. The paired t-test and Wilcoxon sign rank test compared the immunization coverage before the intervention and coverage of the same vaccines during and after the intervention. The use of the paired t-test or the Wilcoxon sign rank test was based on the type of distribution of data on variables which was determined using the Shapiro Wilk W test of normality.

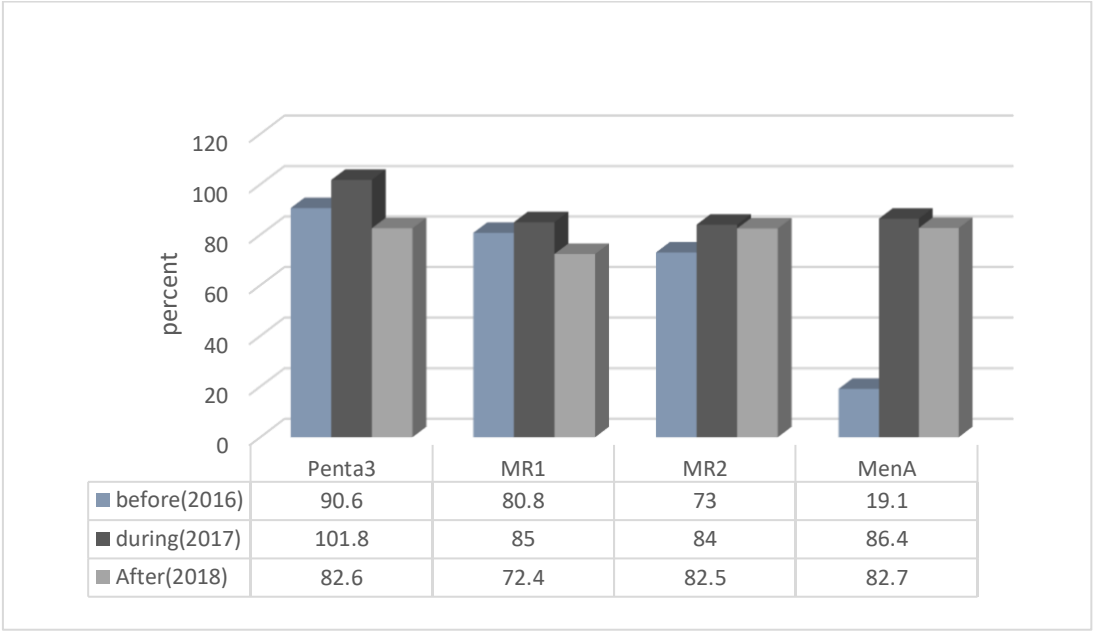
2.8. Ethical considerations

This study was reviewed and approved by the Ethics Review Committee (ERC) of the Ghana Health Service (GHS-ERC) with approval number GHS-ERC 027/06/20. In addition, permission to conduct the study was solicited and obtained from the District Director of Health Service in the Adaklu District and organizations that implemented the project.

3. Results

The district immunization coverage is presented for the three years (before, during, and after social mobilization) and covers the first dose of Measles-Rubella, Penta 3, the second dose of Measles-Rubella, and MenA vaccines.

From Figure 1, annual Penta 3 coverage increased from 90.6% in 2016 to 100 plus % in 2017. However, this reduced to 82.6% in 2018. Similarly, annual coverage for MR1 was higher in 2017 compared to the years before and after the implementation of social mobilization. Thus, MR1 coverage increased from 80% in 2016 to 85% in 2017 and reduced to 72.4% in 2018. There is an observed 5 percentage point and about 12 percentage point difference in MR1 coverage between the year of social mobilization implementation and the years before and after social mobilization respectively.



	Penta3	MR1	MR2	MenA
before(2016)	90.6	80.8	73	19.1
during(2017)	101.8	85	84	86.4
After(2018)	82.6	72.4	82.5	82.7

Figure 1: District Immunization coverage for four antigens for 2016 – 2018

Again, figure 1 indicates that a comparison of annual MR2 coverage shows an increase in coverage from 73% in 2016 to 84% in 2017. In the year (2017) of social mobilization, there was an improved MR2 coverage above the 80% minimum required coverage while coverage, before the intervention was below the minimum, recommended coverage. In 2018 after the social mobilization, coverage for MR2 reduced to 82.5% although it was above the 80% minimum required coverage. Further, there is an observed 67.3 percentage point difference between annual coverages for MenA vaccine wherein 2016 MenA coverage was 19.1% compared to the coverage in 2017 which was 86.4%. The wide difference in MenA coverage before and during social mobilization intervention may be attributed to the intervention due to its mobilization and education of communities and individuals for vaccines. However, the very low coverage in 2016 was because MenA vaccine was introduced into the immunization schedule in Ghana in the fourth quarter of 2016. Therefore, hesitancy on its introduction

may have been high contributing to the very low coverage on its introduction. In 2018 after the intervention, MenA coverage was still above the minimum 80% required coverage although there was about a 3.7 percentage point reduction in coverage.

3.1. Evaluating coverage for 2YL Vaccines in the District before and after Intervention

The descriptive analysis of the coverage for the various antigens of interest indicates an improved immunization coverage in the implementation year (2017) compared to the year before (2016) and the year after (2018). Assessing the statistical significance of the difference in coverage, the Shapiro Wilk W test of normal distribution was used to help determine the appropriate statistical test to use for each outcome variable.

The result of the Shapiro Wilk W test of normal distribution displayed in Table 1, indicates that two of the outcome variables (MR2 coverage and Penta3 coverage) were normally distributed.

Table 2. Shapiro Wilk W test for normally distributed data

Variable	Obs	W	V	z	Prob>z
MR1 coverage	60	0.89703	4.07	2.954	0.00157
MR2 coverage	60	0.96639	1.329	0.598	0.27494[a]
MenA coverage	60	0.89673	4.082	2.96	0.00154
Penta3 coverage	60	0.97552	0.968	-0.069	0.52747[a]

[a]Variable is normally distributed (p value for the W score >= 0.05)

For variables that were normally distributed, the paired t-test was conducted to compare means for each of the years. The result in Table 2 shows that there is an observed difference in the mean which are mostly positive. However, these differences were not statistically significant (i.e., P-values > 0.05). The result implies that social mobilization intervention implemented in the district was not effective in significantly improving coverage for Penta3 and MR2.

Table 3. Paired t-test for normally distributed variable

Antigen	Social Mobilization	Mean	Mean diff	Std. err. Diff	95% Conf. Interval (p-value)
Penta3 coverage	Before (2016)	87.155	-16.28	10.52172	-37.63743- 5.077428 (0.1308)
	During (2017)	103.435			
	During (2017)	103.435	24.01	11.97242	11.97242- 24.01 (0.0521)
	After (2018)	79.425			
	Before (2016)	87.155	7.73	10.56891	-13.72577 - 29.18577 (0.4694)
	After (2018)	79.425			
MR2 coverage	Before (2016)	75.55	-5.34	9.709936	-25.00408 - 14.32408 (0.5856)
	During (2017)	80.89			
	During (2017)	80.89	2.935	9.833148	-16.98204 - 22.85204 (0.7670)
	After (2018)	77.955			
	Before (2016)	75.55	-2.405	10.33182	-23.32103 - 18.51103 (0.8172)
	After (2018)	77.955			

The statistical significance of variables that were not normally distributed was tested using the Wilcoxon sign rank test. The result of the Wilcoxon signed-rank test as presented in Table 3 indicates that the observed difference in the median for MR1 coverage in 2016 and 2017 was not statistically significant. For MenA coverage, the difference in median coverage between 2016 and 2017 was

statistically significant. However, the difference in median coverage for 2017 and 2018 and for 2016 and 2018 was statistically significant. The Wilcoxon sign test revealed Z-socre of 2.02 with a probability value of 0.044 < 0.05 significant level for MR1 coverages for 2017 and 2018 and for 2016 and 2018 coverages, a Z-score of 2.50 with a probability value of 0.011 < 0.05 significant level was obtained. The result implies that social mobilization intervention was effective in improving the coverage for MR1 in 2017 and 2018 compared to 2016.

Table 4. MR1and MenA - Wilcoxon signed-rank test

Total obs = 210		**Obs**	**Total sum rank =210**		**Adjusted forties**	**Unadjusted variance = 717.5**		
Variable	Sign		Sum rank	Expected		Adjusted for zeros	Adjusted variance	Z-score (p-value)
MR1(HF)								
2016 – 2017	Positive	8	106.5	105	-0.13	0	717.38	0.06 (0.964)
	Negative	12	103.5	105				
	Zero	0	0	0				
2017-2018	Positive	14	159	105	0	0	717.5	2.02 (0.044)*
	Negative	6	51	105				
	Zero	0	0	0				
2016-2018	Positive	15	172	105	0	0	717.5	2.50 (0.011)*
	Negative	5	38	105				
	Zero	0	0	0				
MenA (HF)								
2016-2017	Positive	1	19	105	0	0	717.5	-3.211 (0.0006)**
	Negative	29	191	105				
	Zero	0	0	0				
2016 -2018	Positive	1	18	105	0	0	717.5	-3.248 (0.0005)**
	Negative	19	192	105				
	Zero	0	0	0				
2017 -2018	Positive	11	127	105	0	0	717-5	0.821 (0.4304)
	Negative	9	83	105				
	Zero	0	0	0				

*p<0.05; **p<0.01

Again, Table 3 indicates that the observed difference in median coverage for MenA in 2016 and 2017 and 2016 and 2018 were statistically significant. Thus, the difference in coverage before the social mobilization intervention and during the social mobilization intervention is statistically significant with a probability value of 0.0006 < 0.05 significance level. Similarly, the difference before and after the intervention was also statistically significant with a probability value of 0.0005 < 0.05 significance level. The result implies that social mobilization intervention was effective in improving the coverage for MenA before and after the implementation of the social mobilization and even during implementation, the effect of social mobilization was seen on MenA coverage.

3.2. Dropout rate between MR1 and MR2

Health facility dropout rates were compared on annual basis (2016 vs. 2017; 2016 vs. 2018; and 2017 vs. 2018) using a chi square test. Descriptive analysis as presented in table 5 reveals that about 25% and 10% of health facilities in the district in 2016 recorded negative dropouts and no dropouts respectively. However, in the year (2017) of the social mobilization intervention, about 65% (60% recording negative dropout and 5% recording no dropout) of health facilities in the district recorded

either negative dropout or no dropout. The negative dropout rate recorded by health facilities further increased to 70% after the implementation of the intervention in 2018. The annual difference in health facilities' dropout rate before (2016) and after (2018) the intervention is statistically significant at 0.05 alpha level based on Pearson chi-square value of 13.3844 and probability value of 0.010< 0.05 alpha level. The use of Fisher's exact test also revealed statistical significance with a p-value of 0.004< 0.05 alpha level. This implies that the activities of the social mobilization implemented in the year 2017 had made some contribution to reducing the annual dropout rate in the district and improved uptake of the second year of life immunization at the various health facilities.

Table 5. Dropout rate between the first dose of MR and second dose of MR

Year	Negative dropout %(N)	No dropout %(N)	Low dropout %(N)	Moderate dropout %(N)	High dropout %(N)	Pearson chi (P- value)
2016	25% (5)	10% (2)	10% (2)	10% (2)	45% (9)	6.3585 (0.174)$^{!+}$(0.164)
2017	60% (12)	5% (1)	0	10% (2)	25% (5)	
2016	25% (5)	10% (2)	10% (2)	10% (2)	45% (9)	13.3844(0.010)$^{!}$ *$^{+}$(0.004) *
2018	70% (14)	0	20% (4)	0	10% (2)	
2017	60% (12)	5% (1)	0	10% (2)	25% (5)	8.4396(0.077)$^{!+}$ (0.051)
2018	70% (14)	0	20% (4)	0	10% (2)	

$^{+}$Fisher's exact test; $^{!}$Pearson Chi Square test;*p<0.05

4. Discussion

The study revealed that social mobilization contributed to improved coverage for Penta 3, MR1, MR2, and MenA. However, in terms of the statistical effect of social mobilization on immunization coverage, the study revealed that social mobilization was only statistically significant in contributing to improving the coverage for MR1 and MenA vaccines. Further, the study found that the implementation of social mobilization contributed to improving the dropout rate at the facility level. Thus, as a result of social mobilization, the measles-rubella dropout rate at the facility level significantly reduced with the majority of the health facilities in the district recording either no dropout rate or a negative dropout rate.

In immunization service provision, the target is to reach every child. However, there are situations that lead to missed opportunities. For instance, Hanson et al reported that children with missed opportunities are not given vaccines missed in their first year even though they come in contact with health services in their second year of life [12]. The findings of the current study revealed that in the year of social mobilization and after, immunization coverage recorded was higher for all antigens of interest (Penta 3, MR1, MR2, and MenA) compared to the year before the implementation of social mobilization. This confirms the claim that social mobilization strategies contribute to missed out children being reached with immunization services, improving immunization confidence, and having fully immunized children [9, 13]. In addition, similar findings where higher coverage of immunization in communities in Nigeria was attributed to better social mobilization and community participation in the delivery of immunization services [10, 14]. Similarly, a community engagement project, the "Fifth Child" implemented in Ethiopia is taught to have enhanced immunization performance and increased utilization of immunization and selected perinatal health services [15]. Further, it also contributes to increased immunization knowledge, coverage, uptake, and other health services including antenatal care, and a decrease in maternal, infant, and under-5 mortalities [14]. Social mobilization has contributed to improving immunization coverage in communities where vaccine hesitancy is very high [14, 16].

Communication and social mobilization strategies are considered to be a major component in changing the behavior of communities to accept vaccines and improve immunization coverage. India is deemed to have achieved polio eradication mainly through revising it strategies for communication and social mobilization [17, 16]. The effectiveness of social mobilization in improving immunization coverage and health services in communities can be attributed to the involvement of communities in the implementation of health campaigns, where they take ownership of the process, help contextualise activities of the campaign and relate the program to the needs of their local communities [18].

The descriptive analysis of the coverage for the various antigen of interest indicates that the year during and after the social mobilization activities was undertaken had improved coverage compared to the years before. However, a statistical test of the significance of the difference for Penta3 and MR2 coverages were not statistically significant, although there were observed difference in mean coverage. Implying that the implementation of the social mobilization did not have any statistically significant effect on the coverage for Penta3 and MR2. However, for MR1 and MenA, there was a statistical difference in median coverage before and after the implementation of social mobilization, Implyingthat social mobilization was effective in improving the coverage for MR1 and MenA vaccines. Supporting the effectiveness of social mobilization on MR1 and MenA, Haldane et al concluded in their study that community participation has a positive impact on health service delivery, particularly when substantiated by strong organizational and community processes [19]. Thus, social mobilization as an intervention in the provision of primary health care may not be effective in improving the uptake of all health services. Social mobilization may contribute to improving uptake levels of some primary health services, it is not a panacea for improving all levels of public service delivery, it can, however, be effective in improving aspects of service delivery [20].

The dropout rate is one key challenge of immunization services. Multiple-dose vaccines administered at different ages of the child record high coverage for those provided in the early ages than the dose administered in the later ages. The WHO recommends that if there should be a dropout rate at all for vaccines with multiple doses administered at different ages, the rate should be less than 10%. This implies that at least 90% of all children that receive the first dose should also receive the subsequent doses of the vaccine. In Ghana, a study by Nyaku et al. revealed that the dropout rate for Measles-Rubella 1 and 2 were above the 10% WHO recommendation [4]. For instance, three regions; Northern, Volta, and Greater Accra recorded a dropout rate of 32%, 14%, and 31% respectively. The high dropout rate also necessitated the implementation of the 2YL social mobilization. This is because social mobilization has been identified as contributing to the reduction in the dropout rate. For instance, a UNICEF report indicated a diphtheria-containing vaccine campaign in Bangladesh reach 80% of the targeted population which fell short of the projected 95% coverage [21]. The shortfall was attributed to suboptimal social mobilization [22]. With an improvement in social mobilization in the subsequent campaign, coverage for diphtheria vaccination increased >90% [21]. An assessment of social mobilization for immunization in an urban slum found improvement in immunization coverage - 33% drop-out rate at baseline reduced to 1% drop-out after the intervention [7]. Consistent with the finding of Uddin et al and UNICEF, the result of this study on social mobilization indicates that the majority of the health facilities in the district recorded a negative dropout rate in the year after social mobilization activities were implemented. This implies that in the year after project implementation, the number of children immunized for the MR2 vaccine in health facilities exceeded the number immunized for MR1 vaccine. An indication that there were under-five children within the district that had defaulted on MR2 vaccines in previous years but through the social mobilization activities, these children were either referred for immunization or were taken for missed vaccines by caregivers as a result of some form of education or information caregivers have received. A study by Baguune, Ndago, and Adokiya that found lower dropout rates attributed the success in lower dropouts to the health system decentralization efforts,

establishment of Community-based Health Planning Services (CHPS) that provided static and outreach immunization services, and community involvement through health volunteers and defaulter tracing [23] which are major activities of CSO's social mobilization campaigns in communities. On the contrary, high immunization dropout rates in DRC were attributed to unavailability of seats, non-compliance with the order of arrival during vaccination in health facilities, as well as the lack of a reminder system on days before the scheduled vaccination [24]. This situation can be averted by integrating social mobilization in the immunization service provision at the community level to help lower the immunization dropout rate as established in this current study.

The CSOs social mobilization activities significantly contributed to a reduction in the dropout rate at the health facility level. There is improved uptake of MR2 vaccines at the facility level and sustained mobilization will ensure a minimal dropout rate. This is because, social mobilization is taught as a community engagement approach that empowers communities, work with volunteers, and develops solutions to be overcome barriers to assessing health services at the local community level such as strengthening governance at the community level to increase the availability and quality of health services [13]. CSOs social mobilization contributing significantly to reducing the facility dropout rate and statistically improving coverage for MR1 and MenA is evidence that improving health outcomes including immunization indicators is not linear progress, it rather involves complex processes influenced by an array of social and cultural factors [19].

A few issues are important in the interpretation of the study findings. First, the study area – Adaklu District has 20 health facilities serving the population of the district. This limited the sample size (number of health facilities) used for the study with possible of affecting the external validity of data. Second, the method for the evaluation was designed after the implementation of the intervention placing a limitation on the use of a control or comparison group raising the questions of validity. However, the use of the single group pre and post-test design allows pre-intervention data to be used as baseline and post-intervention data as end line making it possible to compare results. This study design was useful as conditions for experimental design do not exist to determine the merits of intervention. Third, the evaluation assumed that factors that influence immunization coverage and dropout rate were constant before intervention and after the intervention. The only factor that changed was the implementation of 2YL social mobilization strategies in 2017. Therefore, the results of the evaluation can only be interpreted based on this assumption.

5. Conclusion

The implementation of social mobilization contributed to health facilities in the district significantly improving upon Measles-Rubella dropout rate. The statistical evaluation of the outcome of social mobilization on immunization coverage was significant for MR1 and MenA, but was not statistically significant for Pent3 and MR2 in the study area. However, descriptive evidence on immunization coverage (MR1, MenA, MR2, and Penta3) suggests that the year in which social mobilization was implemented had higher coverages than the year where there was no social mobilization activity. The implementation of social mobilization can be a good strategy for improving immunization coverage while helping achieve the global immunization strategy of leaving no child behind. This is because social mobilization can positively have effects of educating and sensitizing individuals and households on the need for immunization and the fact that immunization is a continuous process beyond age one of the child.

Ethical statement:

The study made use of secondary data and for this reason, the study addressed all the ethical issues related to secondary data sources and their use. Ethical clearance was sought from the Ghana Health

Service Ethics Review Committee with approval number GHS-ERC 027/06/20. In addition, permission to conduct the study was solicited and obtained from the District Director of Health Service in the Adaklu District and organizations that implemented the project.

Acknowledgment:

We wish to thank the District Director of Health Services and Disease Control Officer of the Adaklu District in Volta region, Ghana. Our sincere gratitude goes to Second Year of Life (2YL) coordinator - Dr. Joseph Kwadwo Opare for his encouragement and support when the idea of evaluating the 2YL social mobilization in Adaklu was picked up. We are also thankful to Ghana Coalition of NGOs in Health, the Ghana Red Cross Society, and the Health Promotion Division of Ghana Health Service for allowing your work to be evaluated.

Conflict of interest:

The authors have no conflict of interest.

Funding:

The study was funded by the Authors.

Authors' Contributions:

All authors mentioned in the paper made a significant contribution to the research.
J. K.B: Conceptualization and draft of the manuscript (30%)
J. N: Review of the manuscript (20%)
M. A: Review of the manuscript (20%)
G. C.A: Conceptualization and draft of the manuscript (30%).
All authors reviewed and approved the manuscript.

References

[1] Chandra, S. A., Ramachandra, S. S., et al. "National Family Health Survey-3 reported, low full immunization coverage rates in Andhra Pradesh, India: who is to be blamed?" *Journal of Public Health*, 33 (4), 489-495, 2011.

[2] European Public Health Alliance, Access to Childhood Vaccination, Brussels, 2015, https://epha.org/wp-content/uploads/2015/12/Access-to-Childhood-Vaccination.pdf

[3] WHO, "2018 Assessment report of the Global Vaccine Action Plan. Strategic Advisory Group of Expert on Immuization" Geneva, 2018, https://apps.who.int/iris/bitstream/handle/10665/276967/WHO-IVB-18.11-eng.pdf?sequence=1&isAllowed=y

[4] Nyaku, M., Wardle, M., et al. "Immunization delivery in the second year of life in Ghana: the need for a multi-faceted approach" *The Pan African Medical Journal*, 27(Supp 3), 4, 2017.

[5] Yawson, A. E., Bonsu, G., et al. "Regional disparities in immunization services in Ghana through a bottleneck analysis approach: Implications for sustaining national gains in immunization", *Archives of Public Health*, *75*(1), 1–10, 2017.

[6] GHS, Ghana Health Service 2014 Annual Report, GHS, Gana, 2015.

[7] Uddin, M. J., Larson, C. P., et al. "Child immunization coverage in urban slums of Bangladesh: Impact of an intervention package", *Health Policy and Planning*, 25(1), 50–60, 2010.

[8] Pradhan, N., Ryman, T. K., et al. "Expanding and improving urban outreach immunization in Patna, India", *Tropical Medicine and International Health*, 17(3), 292–299, 2012.

[9] Deutsch, N., Singh, P., et al "Legacy of Polio - Use of India's Social Mobilization Network for Strengthening of the Universal Immunization Program in India", *Journal of Infectious Diseases*, *216*(Suppl 1), 260–266, 2017.

[10] Dienye, P., Itimi, K., et al. "Community participation and childhood immunization coverage: A comparative study of rural and urban communities of Bayelsa State, south-south Nigeria", *Nigerian Medical Journal*, *53*(1), 21, 2012.

[11] WHO (2020, Feb. 21). *WHO's Reproductive Maternal and Child Health (RMCH) scorecard platform* [Online]. Available: https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/health-equity-monitor-reproductive-maternal-newborn-and-child-health-interventions-(rmnch)-combined

[12] Hanson, C. M., Mirza, I., et al. "Enhancing immunization during the second year of life by reducing missed opportunities for vaccinations in 46 countries". *Vaccine*, 36(23), 3260–3268, 2018.

[13] Jalloh MF, Sengeh P, Ibrahim N, et al. "Association of community engagement with vaccination confidence and uptake: A cross-sectional survey in Sierra Leone, 2019", *J Glob Health*, 12:04006, 2022. doi: 10.7189/jogh.12.04006

[14] McArthur-Lloyd, A., McKenzie, A., et al. "Community Engagement, Routine Immunization, and the polio Legacy in Northern Nigeria", *Global Health Communication*, 2(1), 1-10, 2016.

[15] Demissie, S. D., Kozuki, N., et al. "Community engagement strategy for increased uptake of routine immunization and select perinatal services in north-west Ethiopia: A descriptive analysis". *PLoS ONE*, 15(10), e0237319, 2020

[16] Choudhary M, Solomon R, Awale J, Dey R, Singh JP, Weiss W. "Significance of a social mobilization intervention for engaging communities in polio vaccination campaigns: Evidence from CORE Group Polio Project, Uttar Pradesh, India", *J Glob Health*,11:07011, 2021

[17] Debaje, S. P. "Communication and mobilization campaigns for immunization (CMCI): need of time for strengthening Immunization services in India", *International Journal of Research in Medical Science*, 2(3), 830-833, 2014.

[18] Chimpololo, A. and Burrowes, V. "Use of Social Mobilization and Community Mobilizers by Non-governmental Health Organizations in Malawi to Support the Eradication of Polio, Improve Routine Immunization Coverage, and Control Measles and Neonatal Tetanus", *Am. J. Trop. Med. Hyg.*, 101(Suppl 4), 85–90, 2019

[19] Haldane, V., Chuah, F. L. et al. "Community participation in health services development, implementation, and evaluation: A systematic review of empowerment, health, community, and process outcomes". *PLoS ONE*, 14 (5), e0216112, 2019.

[20] Giné, X., Khalid, S. et al. "The Impact of Social Mobilization on Health Service Delivery and Health Outcomes Evidence from Rural Pakistan", in: *Towards Gender and Development* (Ed. Siwan Anderson, Lori Beaman, and Jean-Philippe Platteau), Oxford University Press, London, pp. 1 – 25, 2018.

[21] UNICEF "Bangladesh Humanitarian Situation Report No.22", Rohingya Influ, UNICEF, 2018

[22] Jalloh, M. F., Wilhelm, E., et al. "Mobilize to vaccinate: lessons learned from social mobilization for immunization in low and middle-income countries", *Human Vaccines & Immunotherapeutics*, 16(5), 1208-1214, 2020.

[23] Baguune, B., Ndago, J.A. & Adokiya, M.N. "Immunization dropout rate and data quality among children 12–23 months of age in Ghana", *Arch Public Health*, 75(18), 1-8, 2017.

[24] Kayembe-Ntumba, HC., Vangola, F., Ansobi, P. *et al.* "Vaccination dropout rates among children aged 12-23 months in the Democratic Republic of the Congo: a cross-sectional study", *Arch Public Health*, 80(18), 1-10, 2022.

International Journal of Health Services Research and Policy
www.dergipark.org.tr/ijhsrp

IJHSRP

e-ISSN: 2602-3482

Research Article

ANALYSIS OF CANCER PATIENTS' ILLNESS ACCEPTANCE AND HOPE LEVELS AS PER GENDER AND CANCER DIAGNOSIS

***Betül Esra ÇEVİK*[1] *Feride TAŞKIN YILMAZ*[*2] *Kadriye ALDEMİR ATMACA*[1] *Ezgi YILDIZ*[1]**

[1]Sivas Cumhuriyet University, Health High School of Susehri, Sivas, Turkey
[2]Sakarya University of Applied Sciences, Faculty of Health Sciences, Sakarya, Turkey
* Corresponding author; feride_taskin@hotmail.com

Abstract: *The identification and evaluation of the factors associated with cancer are essential to the process of coping with cancer and adapting to it. This research was conducted to find the cancer patients' levels of illness acceptance and hope and analyze their illness acceptance and hope levels as per gender and cancer diagnosis. A total of 135 patients were included in the research that was designed as a descriptive and correlational study. The data were collected by using the patient identification form, the Acceptance of Illness Scale (AIS), and the Herth Hope Index (HHI). Percentage, mean, Pearson correlation analysis, student t-test, and Kruskal-Wallis test were used in the evaluation of the data. It was found that the participant patients obtained medium-level mean scores from the AIS and the HHI. Besides, it was identified that there was a low-level statistically significant positive relationship between the mean scores obtained by participant patients from these two measurement tools. Upon the comparison of participant patients' mean AIS and HHI scores as per gender, it was discerned that there was no statistically significant difference in the mean AIS and HHI scores as per gender. It was found that the participants diagnosed with respiratory cancer had higher levels of illness acceptance. While there was no statistically significant difference in the participant patients' mean HHI scores as per the cancer diagnosis; it was discerned that the participants diagnosed with gynecologic cancer obtained a higher mean score from the interconnectedness sub-scale of the HHI. It is recommended that therapies targeted to the patients with low-level illness acceptance and hope be organized and the patients' illness acceptance and hope levels be evaluated at certain intervals.*

Keywords: *Acceptance, Cancer, Diagnosis, Gender, Hope, Patients*

Received: September 10, 2021 *Accepted: March 18, 2022*

1. Introduction

Cancer is the second leading cause of death in our country and in the world. Globally, one out of every 6 deaths, and one out of every 5 deaths in Turkey is due to cancer [1]. Despite technological advancements in health sciences that enrich and develop treatment methods, cancer is still perceived as an incurable illness. When the incurability and social weight of the illness are combined with the lifestyle changes, the idea that life is restricted comes into view [2,3]. This situation makes it difficult for the patients to successfully accept illness, adapt to it or cope with it [4]. On the other hand, the relevant literature showed that the high-level acceptance of illness prevented the patient from focusing on negative emotions, reduced the severity of symptoms, facilitated the acceptance of restrictions connected with illness, and provided more motivation for the fight with illness [5,6]. Besides, it was indicated that the constructive coping method was a significant quality that provided the patient with the

opportunity to live longer and have a better quality of life [7]. On the other hand, the patient's acceptance of illness is not alone adequate for the fight with illness. For each behavior that will promote adaptation to treatment, coping, and well-being, the patient needs strong positive emotions. The foundation of these positive emotions is the patient's hope of recovering from the illness [8].

Hope is a dynamic force that gives power to individuals for adaptation to the future and enables them to pay attention to the future and their lives and find meaning in life [9,10]. The patients' hopes are often threatened by cancer as it is an illness that affects the individual's emotional state, changes the individual's self-perception and perception about the future and the world, and reduces the individual's control by disrupting expectations about life [11]. The importance of high-level hope for cancer patients to both cope with illness and control symptoms is highlighted by the studies performed on this topic. The study by Taleghani et al. [12], found that hope was a significant coping strategy for women diagnosed with breast cancer, and the study by Lin et al. [13], identified that the cancer patients with high-level hope could better cope with pain and had a better emotional state. The study by Liu et al. [14], states that the cancer patients with low levels of hope more frequently had depression and these patients had a shorter lifespan.

In a cancer patient's treatment, the patient's psychological well-being and adaptation to treatment affect the success of treatment [15]. Therefore, it is important that the patient accept illness and have strong hope. On this topic, big responsibilities fall upon the nurses who form a professional group. As the nurses are next to the patient when illness is first diagnosed and later during illness and treatment, in other words, at all moments of illness, they are responsible for knowing the meanings attributed by the patient to illness and hope and the factors associated with illness, developing effective nursing initiatives with this knowledge, and in the end, using strategies for alleviating the patient's negative emotions [10]. This study was performed to enlarge the scientific data necessary for the fulfillment of these responsibilities and analyze the factors affecting cancer patients' illness acceptance and hope as per the relevant literature.

2. Material and Methods

2.1. Aim and Type of Research

The research was designed as a descriptive and correlational study to identify the cancer patients' levels of illness acceptance and hope and analyze their illness acceptance and hope levels as per gender and cancer diagnosis.

2.2. Population and Sample of the Research

The research population was comprised of individuals who were diagnosed previously at least six months ago with cancer and hospitalized at the Oncology Center, Oncology Surgery Service, Hematology Service, and the General Surgery Service of a university hospital between 22 April – 30 October 2019 or applied to these services on these dates. Using power analysis, with an error rate of α=0.05 and a medium effect size of 0.25, as well as the targeted testing power of 0.80, the minimum required sample size was determined as 124. In this context, the study included 135 cancer patients who were aged 18 years or above, could answer the questions independently, had no illness likely to affect the decision-making competency (dementia, psychological problems, and so on), and agreed to participate in the study were included the research sample.

2.3. Data Collection Tools

The research data were collected by using the Patient Identification Form, the Acceptance of Illness Scale, and the Herth Hope Index.

2.3.1 Patient Identification Form

The form that was prepared by the researchers had a total of 20 questions about participant cancer patients' data (age, marital status, education level, employment status, diagnosis, stage, & duration of illness, treatment method & its duration, and so on).

2.3.2 Acceptance of Illness Scale (AIS)

The scale was developed by Felton and Revenson (1984) to measure the patient's illness acceptance level. With the participation of diabetic individuals, Besen and Esen [16] performed the validity and reliability study for the scale in Turkish. Designed as a five-point Likert-type scale, the AIS has eight items and is scored based on the respondent's agreement or disagreement with each item. The minimum and maximum scores to be obtained from the scale are respectively 8 and 40 points. Agreeing with the statements presented in the scale is rated with a low score (one point) and this refers to the lack of illness acceptance and points to poor adaptation to illness and serious physical illness. Disagreeing with the statements under the scale is rated with a high score (five points) and the high score is the proof that the illness is embraced by the patient and refers to the absence of negative emotions about illness and presence of illness acceptance. High-level acceptance of illness is an indicator of the adaptation to illness and shows that the physical illness is felt just a little. In the validity and reliability study performed in Turkish for the scale, Cronbach's alpha coefficient as the measure of internal consistency was found as 0.79 [16]. In this study, Cronbach's alpha coefficient was calculated as 0.89 for the scale.

2.3.3 Herth Hope Index (HHI)

The index was developed by Herth [17]. Aslan et al. [8] performed the validity and reliability study for the index in Turkish and adapted it to Turkish society. The index has 12 items. Four options ("I strongly disagree", "I disagree", "I agree", and "I strongly agree") are present for each item. The HHI has three sub-scales (temporality and future, positive readiness and expectancy, and interconnectedness). The sub-scale of temporality and future addresses the cognitive-temporal aspect of hope, the sub-scale of positive readiness and expectancy refers to the emotional-behavioral aspect of hope, and the sub-scale of interconnectedness pertains to the aspect of hope relevant to the relationships and conditions that the respondent has. There are four items under each sub-scale. The total score is calculated by summing the scores obtained from each item. The total score to be obtained from the HHI ranges from 12 to 48 points while the score to be obtained from each HHI sub-scale ranges from 4 to 16 points. A high total score indicates that the respondent has high-level hope. In the study by Aslan et al. [8], Cronbach's alpha coefficient was found as 0.88 for the HHI. In this study, Cronbach's alpha coefficient was calculated as 0.83 for the HHI, 0.81 for the sub-dimension of temporality and future, 0.84 for the sub-dimension of readiness and expectancy, and 0.83 for the sub-dimension of interconnectedness.

2.4. Data Collection

The research data were collected in a comfortable setting via face-to-face interviews. Filling in the data collection forms took participants approximately 25-30 minutes.

2.5. Ethical Dimension

Before collecting the research data, the ethical endorsement was obtained from the ethics committee of Sivas Cumhuriyet University (Decision Number and Date: 2019-04/03; 17.04.2019) and written permission was received from the institution where the research was conducted. Besides, each cancer patient was informed about the coverage of the research, was told that participation in the research was voluntary, and was asked to consent verbally to participate in the research.

2.6. Evaluation of Data

The research data were evaluated with the Statistical Package for Social Science 23.0. Whether the data were normally distributed was checked via the Kolmogorov-Smirnov test. The data about the participant patients' socio-demographic and illness-related characteristics were expressed as percentages and arithmetic means, and the Pearson correlation test was utilized to analyze the relationship between participant patients' mean AIS and HHI scores. In the correlation analysis, the r coefficient was evaluated as 0.00-0.25 very weak, 0.26-0.49 weak, 0.50-0.69 moderate, 0.70-0.89 high, and 0.90-1.00 very high correlation [18]. The student t-test and the Kruskal-Wallis H test were used to find whether there were statistically significant differences in participant patients' mean AIS and HHI scores as per gender and cancer diagnosis. In the research, the statistical significance was identified if the p-value was below 0.05 ($p<0.05$).

3. Results

The participant cancer patients had a mean age of 61.05±12.78 years and 67.4% of the participants were male. Of all participant patients, 30.4% were elementary school graduates, 67.4% were married, 6.7% lived alone, 91.1% were not working, 82.2% stated that they had medium-level income, 54.1% had a history of cigarette smoking, and 5.2% still smoked.

The mean duration of having illness and the mean duration of having treatment were successively 7.20±7.14 and 6.58±6.37 years for the participant patients. While 42.2% of the participant patients were diagnosed with hematological cancer, 20.7% of them were diagnosed with gastrointestinal cancer. It was discerned that, of all participant patients, 54.8% were stage 2 cancer patients, 28.9% had a family member with a similar illness, 54.8% had an additional chronic disease, and 92.6% received information about the illness from a doctor or nurse. While 44.7% of the participant patients evaluated that they had a good general state of health, 55.6% of them said that they could meet their daily needs with outside help, and 95.6% of them told that there was an individual who dealt with their care and treatment at home (Table 1).

Table 1. Characteristics of the patients regarding the disease and treatment

Characteristics	**X̄± SD**	
Age (year)	61.05±12.78	
Disease duration (year)	7.20±7.14	
Treatment duration (year)	6.58±6.37	
Diagnosis	**n**	**%**
Hematological cancers	57	42.2
Gastrointestinal system cancers	28	20.7
Gynecological cancers	27	20.0
Respiratory system cancers	23	17.1

Table 1. continued

Cancer stage		
I. stage	23	17.0
II. stage	74	54.8
stage	38	28.1
Type of Treatment		
Only chemotherapy	64	47.4
Only radiotherapy	15	11.1
Only surgical	17	12.6
Chemotherapy and surgery	19	14.1
Chemotherapy and radiotherapy	13	9.6
Radiotherapy and surgery	7	5.2
Presence of an individual with a similar disease in the family (mother, father, sibling, spouse, child)		
Yes	39	28.9
No	96	71.1
Presence of other chronic diseases		
Yes	74	54.8
No	61	45.2
The status of receiving education from a physician or nurse about the disease		
Yes	125	92.6
No	10	7.4
General health assessment		
Good	60	44.4
Middle	59	43.7
Bad	16	11.9
Ability to meet daily needs alone		
She/he can do it alone	60	44.4
She/he can do with the help	75	55.6
Presence of individuals interested in home care and treatment		
Yes	129	95.6
No	6	4.4
Presence of friends or family members to share their distress and feelings with		
Yes	130	96.3
No	5	3.7

Table 2 displayed the breakdown of participant patients' mean AIS and HHI scores. In this respect, it was identified that the participant patients had a medium-level mean AIS score (24.57±7.87 points), and hence, they had medium-level adaptation to cancer and felt physical illness at the medium level. Besides, it was found that the participant patients had a medium-level mean HHI score (32.65±7.44 points). Moreover, it was discerned that there was a low-level statistically significant positive relationship between the participant patients' mean AIS and HHI scores ($r=0.284$, $p=0.001$).

Table 2. The breakdown of participant patients' mean AIS and HHI scores

Scales	The min-max points that can be obtained	Min-max points received	X̄± SD	Acceptance of Illness Scale Test/ p
Acceptance of Illness Scale	8-40	10-40	24.57±7.87	-
Herth Hope Index	12-48	16-48	32.65±7.44	r=0.284/ 0.001*
Temporality and future	4-16	4-16	9.45±3.08	r=0.300/0.000*
Positive readiness and expectancy	4-16	5-16	10.88±2.81	r=0.389/0.000*
Interconnectedness	4-16	6-16	12.11±2.38	r=0.037/ 0.669

*p<0.01

Upon the comparison of participant patients' mean AIS and HHI scores as per gender, it was discerned that there was no statistically significant difference in the female and male patients' illness acceptance and hope levels (p>0.05) (Table 3).

Table 3. The comparison of participant patients' mean AIS and HHI scores as per gender

Scales	Female	Male	Test/ p
Acceptance of Illness Scale	24.16±7.53	24.85±8.12	t=0.494 / 0.622
Herth Hope Index	32.51±7.81	32.74±7.23	t=0.169 / 0.866
Temporality and future	9.55±3.24	9.72±2.99	t=0.318 / 0.751
Positive readiness and expectancy	10.81±2.83	10.92±2.82	t=0.224 / 0.823
Interconnectedness	12.14±2.49	12.08±2.31	t=-0.147 / 0.883

t: Student t-test

Likewise, upon the comparison of participant patients' mean AIS scores as per the cancer diagnosis, it was found that there was a statistically significant difference in the participant patients' illness acceptance levels as per the cancer diagnosis (p<0.05). In this regard, it was identified that the participant patients diagnosed with respiratory cancer had higher levels of illness acceptance. Furthermore, there was no statistically significant difference in the participant patients' mean HHI scores as per the cancer diagnosis (p>0.05) whereas there was a statistically significant difference in the mean HHI Interconnectedness sub-scale scores as per the cancer diagnosis and the participant patients diagnosed with gynecologic cancer obtained a higher mean score from the HHI Interconnectedness sub-scale (p<0.05) (Table 4).

Table 4. The comparison of participant patients' means AIS and HHI scores as per the cancer diagnosis

Scales	Hematological cancers	Gastrointestinal system cancers	Gynecological cancers	Respiratory system cancers	Test/ p
Acceptance of Illness Scale	24.08±7.60	22.35±7.15	24.22±8.13	28.91±7.89	KW=8.586 / 0.035*
Herth Hope Index	30.73±6.89	34.64±7.17	35.11±8.11	32.08±7.31	KW=5.979 / 0.113
Temporality and future	8.92±2.54	10.35±2.87	10.48±3.86	9.65±3.29	KW=6.486 / 0.090
Positive readiness and expectancy	10.28±2.62	11.57±2.97	11.33±3.25	11.00±2.37	KW=3.948 / 0.268
Interconnectedness	11.52±2.49	12.71±2.15	13.29±1.89	11.43±2.27	KW=13.200/0.004**

*p<0.05;** p<0.01; KW: Kruskal-Wallis test

4. Discussion

The socioeconomic variables can affect the levels of illness acceptance, adaptation to illness, and hope. Age, gender, education level, and economic status are among these variables [19]. On the other hand, in this study, it was found that, as per gender, there was no statistically significant difference in the participant cancer patients' levels of illness acceptance and hope. Likewise, in another study, it was identified that there was no statistically significant difference in the levels of hope as per gender [8]. Also, in a systematic study of collected works that analyzed three studies, it was put forward that only one study found that gender was a significant factor affecting hope and, in this sense, women had higher levels of hope than men [20]. On the other hand, certain studies demonstrated that male cancer patients had significantly higher levels of hope than female cancer patients [9,21]. The finding of this study about the effect of the variable of gender may have been obtained since the numbers of female and male participants were not close to each other in this study.

The acceptance of illness enables cancer patients to evaluate their health status objectively and is a significant motivating factor for cancer patients to cope with illness. In this study, it was found that the participant patients had a medium-level acceptance of illness whilst they had medium-level adaptation to cancer and felt the physical illness at the medium level. It was ascertained that the cancer patients' illness acceptance levels varied across the studies in the relevant literature. In certain studies, that used a similar scale, it is identified that the cancer patients had higher levels of illness acceptance than the participant patients in this study. Among these patients with higher levels of illness acceptance, it is discerned that there were patients with breast cancer [22-24], colorectal cancer [24,25], and urinary tract cancer [19,24,26]. In a study that analyzed the lung cancer patients, an illness acceptance level that was close to the one found in this study was obtained [24]. In a study performed with patients diagnosed with leukemia, it was discerned that the illness acceptance level was low [27]. Unlike other studies in the relevant literature, obtaining medium-level illness acceptance in this study may have stemmed from the characteristics and size of the study sample. Additionally, it is considered that medium-level illness acceptance is not enough to ensure that the best adaptation to illness will be attained, and hence, psycho-oncological therapy is needed to raise the level of illness acceptance.

In this study, it was found that the patients diagnosed with respiratory cancer had higher levels of illness acceptance. In contrast to this finding of this study, certain studies in the relevant literature identified that the patients with lung cancer and gastrointestinal cancer had lower levels of illness acceptance as the lung cancer and gastrointestinal cancers had a bad prognosis and the life expectancy was shorter, on the other hand [24]; the patients diagnosed with breast cancer [22-24], and urinary tract cancers had higher levels of illness acceptance [19,24,26]. Likewise, in the study carried out by Religioni et al. [24], to examine the illness acceptance levels of the patients with lung, prostate, and colorectal cancers, it was found that the illness acceptance levels depended on the cancer type and the patients with prostate cancer had the highest levels of illness acceptance whilst the patients with lung cancer had the lowest levels of illness acceptance. Also, in the study by Ślusarska et al. [28], it was asserted that there was a statistically significant difference in the mean acceptance scores of the women with breast cancer and the women with lymphoma, and the women with breast cancer had higher levels of illness acceptance in this sense. In light of the finding of this study that differs from the relevant literature, it can be considered that the cultural factor affects the process of coping with cancer. The fatalistic approach is common in the case of fatal diseases in Turkish culture [29], and hence, it is supposed that this approach would have implications also on the illness acceptance levels.

Hope is acknowledged as a significant component of coping with cancer [8]. However, in this study, it was found that the participant cancer patients had medium-level hope. Contrary to this finding of this study, the studies in the relevant literature found that the cancer patients had higher levels of hope

[10,30-32]. Likewise, in a study performed on patients with breast cancer, it was discerned that the level of hope was higher in the period after treatment than the period before treatment [33]. The cancer patients in this study may have had lower levels of hope than cancer patients addressed in the relevant literature since the cancer patients included in this study were hospitalized in the data collection phase of the research and a large part of them were in the treatment process.

The high-level illness acceptance and hope reduce the intensity of patients' illness-related negative emotions and enable patients to embrace the illness-related restrictions because high-level illness acceptance and hope appertain to positive emotions that lower the psychological burden of the illness and enhance the quality of life. In this study, it was found that there was a positive relationship between illness acceptance and hope levels. In a similar vein, the study performed by Sze et al. [34] on patients with brain tumors identified that, as the patients' hope levels increased, the life expectancy, symptom controls, and illness acceptance went up in patients. The positive sensation starting with the acceptance of illness is reinforced by hope. Finding a positive relationship between illness acceptance and hope just as the one found in this study is an expected result.

The most important limitation of the research is that the research was conducted in a single center and within a certain time period. Another limitation is the collection of data based on hope and illness perception by the self-report method.

5. Conclusion

In this study, it was found that the participant cancer patients had medium-level illness acceptance and hope, and as the level of illness acceptance increased, the level of hope also increased. Additionally, it was discerned that the patients diagnosed with respiratory cancer had higher levels of illness acceptance, and also, as per gender, there was no difference in the participant patients' illness acceptance and hope levels. To be able to cope with illness effectively, it is important that the patients accept illness and have the hope of recovery. Having these positive emotions at the highest level reduces the feeling of dependence, increases self-esteem, and enhances self-efficacy. During the disease process, healthcare professionals, especially nurses can elevate the patient's hopes and reinforce the patient's adaptation to disease by allocating some time to speak to the patient, answering the patient's questions, exhibiting positive and honest behaviors toward the patient, being next to the patient, giving patient information about the disease, and providing the patient with effective care. In this context, it is recommended that therapies targeted to the patients with low-level illness acceptance and hope be organized and the patients' illness acceptance and hope levels be evaluated at certain intervals.

Ethical Declaration: This work was approved by the ethics committee of Sivas Cumhuriyet University (Decision Number and Date: 2019-04/03; 17.04.2019).

Conflict of interest: The authors declare that they have no conflict of interest.

Authors' Contributions: The authors declare that their contribution to the work is equal.

The compliance to the Research and Publication Ethics: This study was carried out in accordance with the rules of research and publication ethics.

References

[1] T.C. Sağlık Bakanlığı Halk Sağlığı Genel Müdürlüğü. (2017). *Türkiye Kanser İstatistikleri 2017* [Online]. Available: https://hsgm.saglik.gov.tr/tr/kanser-istatistikleri/yillar/2017-turkiye-kanser-i-statistikleri.html

[2] Farinhas, G.V., Wendling, M.I., Dellazzana-Zanon, L.L., "Psychological impact of a cancer diagnosis on the family: a case study on the perception of the caregiver", *Pensando Fam, 17, 111-129,* 2013.

[3] Guerrero, G.P., Zago, M.M.F., Sawada, N.O., Pinto, M.H., "Relationship between spirituality and cancer: patient's perspective", *Rev Bras Enferm,* 64(1), 53-59, 2011.

[4] Chao, H.L, Tsai, T.Y, Livneh, H, Lee, H.C, Hsieh, P.C., "Patients with colorectal cancer: the relationship between demographic and disease characteristics and acceptance of disability", *Journal of Advanced Nursing,* 66 (10), 2278–2286, 2010.

[5] Dijkstra, A., Buunk, A., T´oth, G., Jager, N., "Psychological adjustment to chronic illness: The role of prototype evaluation in acceptance of illness", *Journal of Applied Biobehavioral Research,* 12(3-4), 119–140, 2008.

[6] Telford, K, Kralik, D., Koch, T., "Acceptance and denial: Implications for people adapting to chronic illness: a literature review", *Journal of Advanced Nursing,* 55(4), 457–464, 2006.

[7] Bussell and, V.A., Naus, M.J., "A longitudinal investigation of coping and post-traumatic growth in breast cancer survivors", *Journal of Psychosocial Oncology,* 28 (1), 61–78, 2010.

[8] Aslan, Ö., Sekmen, K., Kömürcü, Ş., Özet, A., "Kanserli hastalarda umut", *C.Ü. Hemşirelik Yüksekokulu Dergisi*, 11 (2), 18-27, 2007.

[9] Duggleby, W., Ghosh, S., Cooper, D., Dwernychuk, L., "Hope in newly diagnosed cancer patients", *Journal of Pain and Symptom Management,* 46(5), 661-670, 2013

[10] Sanatani, M., Schreier, G., Stitt, L., "Level and direction of hope in cancer patients: an exploratory longitudinal study", *Support Care Cancer,* 16 (5), 493–499, 2008.

[11] Dedeli, Ö., Fadıloğlu, Ç., Uslu, R., "Kanserli bireylerin fonksiyonel durumları ve algıladıkları sosyal desteğin incelenmesi", *Türk Onkoloji Dergisi,* 23 (3), 132-139, 2008.

[12] Taleghani, F., Yekta, Z.B., Nasrabadi, A.N., "Coping with breast cancer in newly diagnosed Iranian women", *Journal of Advanced Nursing,* 54 (3), 265-272, 2006.

[13] Lin, C.C., Lai, Y.L., Ward, S.E., "Effect of cancer pain on performance status, mood states, and level of hope among Taiwan secancer", *J Pain Symptom Manage*, 25 (1), 29-37, 2003.

[14] Liu, L., Fiorentino, L., Natarajan, L., Parker, B.A., Mills, P.J., Sadler, G.R., Dimsdale, J.E., Rissling, M., He, F., Ancoli-Israel, S., "Pre-treatment symptom cluster in breast cancer patients is associated with worse sleep, fatigue and depression during chemotherapy", *Psychooncology,* 18(2), 187-194, 2009.

[15] Onat, H., Mandel, M.N., *Kanser Hastasına Yaklaşım, Tanı, Tedavi ve Takipte Sorunlar*, Nobel Tıp Kitabevleri, İzmir, 2002.

[16] Besen, D.B, Esen, A., "Hastalığı Kabul Ölçeği'nin Türk Toplumundaki diyabetik bireylere uyarlanması", *TAF Prev Med Bull,*10(2), 155-164, 2011.

[17] Herth, K., "Abreviated instrument to measure hope: development and psychometric evaluation", *J Adv Nurs,* 17(10), 1251-1259, 1992.

[18] Coşansu, G. Verilerin analizi ve yorumlanması. In. *Hemşirelikte Araştırma: Süreç, Uygulama ve Kritik* (Eds. S. Erdoğan, NN Nahcivan, M.N. Esin), Nobel Tıp Kitabevleri, İstanbul, pp.235-280. 2017.

[19] Czerw, A.I., Religioni, U., Deptała, A., Fronczak, A., "Pain, acceptance of illness, adjust mentto life with cancer and coping strategies in prostate cancer patients", *Arch Med Sci,* 13(6), 1459–1466, 2017.

[20] Mahendran, R., Chua, S.M., Lim, H.A., Yee, I.J., Tan, J.Y.S., Kua, E.H., Griva, K., "Biopsychosocial correlates of hope in Asian patients with cancer: a systematic review", *BMJ Open,* 6(10), e012087, 2016.

[21] Rustoen, T., Wiklund, I., "Hope in newly diagnosed patients with cancer", *Cancer Nurs,* 23(3), 214-219, 2000.

[22] Cipora, E., Konieczny, M., Sobieszczański, J., "Acceptance of illness by women with breast cancer", *Annals of Agricultural and Environmental Medicine,* 25(1), 167–171, 2018.

[23] Lewandowska–Abucewicz, T., Kęcka, K., Brodowski, J., "Acceptance of cancer by women after mastectomy in Western Pomerania region– preliminary studies", *Fam Med Prim Care Rev,* 18(2), 143–148, 2016.

[24] Religioni, U., Czerw, A., Deptała, A., "Acceptance of cancer in patients diagnosed with lung, breast, colorectal and prostate carcinoma", *Iran J Public Health,* 44(8), 1135–1142, 2015.

[25] Czerw, A.I, Religioni, U., Deptała, A., Walewska-Zielecka, B., "Assessment of pain, acceptance of illness, adjustment to life with cancer, and coping strategies in colorectal cancer patients", *Gastroenterology Review,* 11(2), 96-103, 2016.

[26] Krajewski, W., Mazur, M., Poterek, A., Pastuszak, A., Halska, U., Tukiendorf, A., Rymaszewska, J., Zdrojowy, R., "Assessment of pain management, acceptance of illness, and adjustment to life with cancer in patients with nonmuscle invasive bladder cancer", *BioMed Research International,* 1-10, 2018

[27] Wiraszka, G., Lelonek, B., "The functioning of a patient with leukemia and the acceptance of neoplastic disease" *Studia Medyczne,* 10, 21–26, 2008.

[28] Ślusarska, B., Nowicki, G.J., Serwata, M., Zboina, B., Łuczyk, M., Szadowska-Szlachetka, Z., "Level of disease acceptance and quality of life in people with lymphoma", *Medycyna Paliatywna/Palliative Medicine,* 8(2), 88–95, 2016.

[29] Kızılarslan, V. Turkish Validity and Reliability Study of the Fatalism Scale. Master thesis, Atatürk University, Erzurum, 2020.

[30] Nekolaichuk, C.L., Bruera, E., "Assessing hope at the end of life: validation of an experience of hope scale in advanced cancer patients", *Palliative Supportive Care* 2(3), 243–253, 2004.

[31] Benzein, E.G., Berg, A.C., "The level of and relation between hope, hopelessness, and fatigue in patients and family members in palliative care", Palliat Med, 19(3), 234–240, 2005.

[32] Zhang, J., Gao, W., Wang, P., Wu, Z.H., "Relationships among hope, coping style and social support for breast cancer patients", *Chin Med J,* 123(17), 2331-2335, 2010.

[33] Balsanelli, A.C.S., Grossi, S.A.A., "Predictors of hope among women with breast cancer during chemotherapy", *Rev Esc Enferm USP*, · 50(6), 898-904, 2016.

[34] Sze, J., Marisette, S., Williams, D., Nyhof-Young, J., Crooks, D., Husain, A., Bezjak, A., Wong, R.K., "Decision making in palliative radiation therapy: reframing hope in caregivers and patients with brain metastases", Support Care Cancer, 14(10), 1055–1063, 2006.

International Journal of Health Services Research and Policy
www.dergipark.org.tr/ijhsrp

IJHSRP

e-ISSN: 2602-3482

Research Article

PATIENTS' SLEEP QUALITY AND AFFECTING FACTORS ON POST-MASTECTOMY

Serap KURTAR* [1] ***Nigar ÜNLÜSOY DİNÇER*** [2]

[1]Dr. Abdurrahman Yurtaslan Oncology Training and Research Hospital, Ankara/Turkey
[2] Ankara Yıldırım Beyazıt University, Faculty of Health Science, Ankara/Turkey
*Corresponding author: serapcam4@gmail.com

Abstract: *This descriptive and cross-sectional study was conducted to determine sleep quality and factors affecting sleep in patients who have been operated on mastectomy surgery. The sample of the study is comprised of those patients (n=110) who visited general surgery outpatient clinic in an education and research hospital in Ankara between January 1 and July 30, 2020, for the check after their mastectomy surgery, agreed to participate in the study and met research criteria. The Patient Information Form and the Pittsburg Sleep Quality Index (PSQI) were used as data collection tools. The numbers and percentages, t-test and Kruskal Vallis Chi-Square, and Fisher's Exact Spearman Correlation analysis were used to evaluate the data. Written permission from the ethics committee and the institution, and written consent from the patients were obtained to conduct the study. After the mastectomy surgery of patients who participated in the study, the average PSQI score of them was 10.19 ± 3.44 (2-18). After the mastectomy surgery of the patients, it was determined that 60,9% of the patients had a decrease in sleep quality, 89,1% had poor sleep quality, and 81,8% had a change in the postoperative sleeping position. There was no statistically significant difference between the findings related to the characteristics of the patients and the PSQI mean scores (p> 0.05). According to the results of the study, patients who have poor sleep quality and changes in their sleep habits after mastectomy surgery should be given the training to improve sleep quality before discharging from the hospital. In the field of nursing, it is recommended to conduct experimental studies to increase the sleep quality of patients.*

Keywords*: Nursing, Mastectomy, Pittsburgh Sleep Quality Index, Sleep, Sleep Quality.*

Received: May 08, 2021 *Accepted: April 13, 2022*

1. Introduction

The most common type of cancer among women in Turkey and the world is breast cancer [1]. 2.088.849 new breast cancer cases were diagnosed in the world in 2018 [2]. In Turkey, in 2017, a breast cancer diagnosis has been put to one in every four women, total in one year 19.211 women was diagnosed with breast cancer [3]. With the advancing technology, many new treatment methods for breast cancer have emerged. These treatment methods have increased the survival rate in breast cancer patients [4].

Being diagnosed with breast cancer is an extremely traumatic and stressful process for women [4]. Women who have undergone mastectomy have difficulty in accepting the deterioration of their bodies after surgery and, as a result, face many problems such as shaking of body image, loss of self-confidence, and decreased sexual attraction [5]. In addition to these psychosocial problems experienced

by women after mastectomy, patients also encounter many physiological problems such as infection, pain, phantom breast, and lymphedema during and after surgical wound healing [6,7,8].

Another problem experienced by women who have undergone a mastectomy after breast cancer is sleep disorders. Low sleep quality, inefficient sleep, and sleep disorders are among the top five health problems experienced by patients who have undergone a mastectomy, the longest and most serious [9]. Just like psychosocial and physiological problems, sleep disorders can turn into a chronic disease in breast cancer patients starting from the moment of diagnosis and covering the whole process [10].

Sleep is one of the most basic human needs, both physically and psychologically, and is a compulsory physiological need [11]. Although problems related to sleep in cancer patients are widely known, patients are generally not considered adequately in terms of sleep [12]. Providing qualified and sufficient sleep increases the patient's quality of life by contributing to the reduction of fatigue, depression, and anxiety disorders in patients with mastectomy [13,14,15]. Therefore, evaluating the prevalence of sleep-related problems and determining sleep quality in women who have undergone mastectomy are guiding in planning care [16,17,18]. This study was conducted to determine sleep quality and the affecting factors of sleep quality in patients after mastectomy surgery.

Research Questions

1. What level / how is the sleep quality of patients who have undergone mastectomy surgery?
2. Do characteristics of patients undergoing mastectomy surgery affect sleep quality?

2. Materials and Methods

2.1. Place of Research and its Properties

The study was performed as a descriptive and cross-sectional study. The study was conducted in the outpatient clinics of a training and research hospital in Ankara/Turkey. Patients come to the outpatient clinic for control one month after the operation in the general surgery clinic.

2.2. Research Population and Sample

The population of the study consisted of patients (n=151) who came to the general surgery outpatient clinic after mastectomy between January 1 and July 30, 2020. The sample consisted of patients who came to the control on the same dates and met the criteria for inclusion in the study and were accepted to participate in the study (n=110).

Inclusion criteria in the research

- Having radical and total mastectomy surgery,
- There is no obstacle to communication,
- Absence of a psychological disorder that causes insomnia,
- who voluntarily agree to participate in the research,
- Patients with ages 18 years and older are included.

The criteria for exclusion from the study

- Those who receive surgical treatment other than mastectomy simple mastectomy skin-sparing mastectomy nipple-sparing mastectomy,
- Those diagnosed with a defined psychiatric illness,
- Patients with perception, hearing, and visual impairments that prevent communication were excluded from the sample.

In the research, which was asked to evaluate sleep quality in general, "Has there been a change in your sleep quality after surgery?" Considering the rates obtained from the cross-table between the

questionnaire question and the scale item "How do you evaluate your sleep quality", the power of this study was found to be 0.99.

2.3. Data Collection Instruments

The Patient Information Form and the Pittsburg Sleep Quality Index (PSQI) were used as data collection tools. The Patient Information Form; was prepared by the researchers using the relevant literature [10,13,20] The form consists of two parts and 25 questions. The first part consists of 16 questions, 13 questions include the descriptive characteristics of the patients, and include age, educational status, marital status, employment status, economic status, place of residence, and people with whom they live. The other three questions include whether the individual has other diseases than breast cancer, the medications they use, and the time elapsed after the mastectomy surgery. The second part consists of nine questions evaluating the sleep habits of the patients.

PSQI; It is a subjective assessment scale developed by Buysse et al in 1989 that provides detailed information about the sleep quality and sleep disturbance of the person in the last month [19]. The validity and reliability study in our country was conducted by Ağargün et al. (1996) and the Cronbach alpha value of the scale was found to be 0.80 [20]. In this study, Cronbach's alpha value was found to be 0.72. The scale includes a total of 24 questions. 19 of these questions consist of the answers received from the person himself, the 19th question is about whether the person has a spouse or roommate. The other five questions on the scale are answered by the person's spouse or roommate and are used only for clinical evaluation. While calculating the scale scoring, the 19th question and the five questions answered by their spouse or roommates are not included in the score [20].

2.4. Implementation of the Research

The research data were collected by face-to-face interview technique with patients who came to the outpatient clinic for control after mastectomy surgery. According to the hospital procedure, patients come to the first control two weeks after the operation, and if there is no problem, they come to the next control one month later. Expert opinion was obtained from Mehmet Yücel Ağargün, the owner of the scale, about when the post-surgical PSQI form should be applied, and in accordance with the expert opinion, patients who came for control after mastectomy surgery at least one month after the operation were evaluated.

The aim of the study was explained to the patients who had passed at least one month after their discharge after mastectomy surgery and their written consent was obtained. Interviews with the patients were conducted in the outpatient clinic rooms. Each interview lasted 20-30 minutes on average.

2.5. Ethical Aspect of the Research

Ethical approval was obtained from Yıldırım Beyazıt University's Ethical Committee (Date:13/11/2019; Number: 23). Written permission was obtained from Dr. Abdurrahman Yurtaslan Ankara Oncology Training and Research Hospital (17/12/2019-84) for the implementation of the study. Before starting the application, the purpose of the study was explained to the patients included in the study, and informed consent was obtained by giving information about the study. Written permission was obtained via e-mail from the person who conducted the Turkish validity and reliability study of the PSQI to use the scale.

2.6. Data Assessment

IBM SPSS Statistics 20 program was used in the evaluations and $p < 0.05$ was accepted as the statistical significance limit. Mean standard deviation, median, minimum, and maximum values are

given in descriptive statistics for continuous data, and number and percentage values are given in discrete data. Shapiro-Wilk test was used to examine the conformity of the data to normal distribution.

3. Results

According to Table 1, the minimum score obtained from the scale by the patients participating in the study was 2, the maximum score was 18, and the mean total score of the scale was 10.19±3.44. When the scale total scores of the patients were evaluated, it was determined that 89.1% of the patients had poor sleep quality (PSQI score of 5 and above) according to the PSQI.

Table 1. Distribution of the mean PSQI scores of the patients (n = 110)

Patients' PSQI Scores	**$\bar{X}$ ± SD (min-max)**	
PSQI points	10.19±3.44 (2-18)	
PSQI score	**Number**	**%**
> 5 poor sleep quality	98	89.1
≤ 5 good sleep quality	12	10.9

In Table 2, 51.8% of the patients participating in the study are between the ages of 45-and 59. It was determined that 61.8% of the patients participating in the study lived with their spouses and children, and 9.1% lived alone. It was found that 79.1% of the patients participating in the study were at the middle-income level. It was determined that 78.2% of the patients participating in the study did not work in any job. It was determined that 62.5% of the working patients were private-sector employees.

In Table 2, the distribution of PSQI means scores according to some of the introductory characteristics of the patients participating in the study was examined. The difference between the age groups, marital status, people living together, income, education, employment, smoking status, and PSQI score averages of the patients participating in the study was not statistically significant ($p > 0.05$).

In Table 3, the distribution of PSQI mean scores according to the health status and sleep habits of the patients was examined. It was found that there was no statistically significant difference between the duration of mastectomy surgery and the mean PSQI scores of patients with and without a disease other than breast cancer, patients using drugs, and the types of drugs used ($p > 0.05$).

The mean PSQI scores of the patients who thought that they had sleep problems were found to be significantly higher than the patients who thought they did not have sleep problems ($p < 0.000$).

There is no difference between the average PSQI scores with the electronic equipment in the room they sleep in, the activities they do before sleeping, the darkness of the room they sleep in, the short-term sleep during the day, and the change in the postoperative sleeping position ($p > 0.05$). The difference between the PSQI mean scores of the patients who stated that their sleep quality increased, decreased, or did not change after surgery was not significant ($p = 0.05$)

Table 2. Distribution of the PSQI mean scores of the patients according to some descriptive characteristics (n = 110)

Descriptive Characteristics	PSQI SCORE					
	n	%	$\bar{X} \pm SD$	(min-max)	Test	p
Age groups						
30-44	30	27.3	9.43±3.39	(4-16)	F=1.209	0.302
45-59	57	51.8	10.63±3.40	(2-18)		
≥ 60	23	20.9	10.09±3.58	(2-16)		
Marital Status						
Married	87	79.1	10.00±3.40	(2-18)	t=-1.133	0.260
Single	23	20.9	10.91±3.59	(2-16)		
People with whom they live						
Alone	10	9.1	11.60±3.89	(2-15)	χ^2 =4.281	0.369
With children	16	14.5	10.69±3.36	(5-16)		
With wife and children	68	61.8	9.77±3.38	(2-18)		
With wife/ children/ family elders	8	7.3	10.12±3.91	(5-16)		
With spouse	8	7.3	11.00±3.21	(6-16)		
Income status						
Low	20	18.2	10.95±3.25	(4-16)	t=1.091	0.277
Middle	87	79.1	10.09±3.49	(2-18)		
High	3	2.7	8.00±2.65	(6-11)		
Education Status						
Literate	13	11.8	9.23±2.87	(5-15)	F=1.155	0.330
Primary School	55	50.0	10.75±3.52	(2-16)		
High School	29	26.4	9.79±3.28	(4-18)		
University	13	11.8	9.00±3.89	(2-16)		
Working status						
Working	24	21.8	9.58±3.89	(2-18)	t=-0.978	0.330
Not working	86	78.2	10.36±3.31	(2-16)		
Profession (n=24)						
Public employee	9	37.5	9.89±3.02	(5-14)	U=58.0	0.599
Private sector	15	62.5	9.40±4.42	(2-18)		
Smoking						
Uses	16	14.5	10.56±2.85	(6-16)	t=0.466	0.642
Not using	94	85.5	10.13±3.54	(2-18)		
Smoking time						
10 years and less	5	31.2	10.20±3.77	(6-16)	U=21.0	0.679
> 10 years	10	68.8	10.80±2.66	(7-14)		

Table 3. Distribution of PSQI mean scores according to the health status and sleeping habits of the patients (n = 110)

Other Disease and Sleep Characteristics	n	%	PSQI SCORE $\bar{X} \pm SD$	(min-max)	Test	p
Disease other than breast cancer						
With	52	47.3	10.44±3.54	(4-18)	t=0.724	0.471
Without	58	52.7	9.96±3.37	(2-16)		
Diseases other than breast cancer						
Diabetesmellutus	11	20.8	10.18±2.60	(6-15)		
Hypertension	22	41.4	10.36±3.33	(4-16)		
Thyroid	10	18.9	9.70±4.76	(2-18)	χ^2=0.559	0.906
Other[a]	10	18.9	10.60±3.63	(5-16)		
Any drug use						
Using	68	61.8	10.37±3.66	(2-18)	t=0.684	0.496
Not using	42	38.2	9.90±3.08	(2-16)		
Medication used (n=68)						
Antihipertansif	21	30.9	9.67±3.18	(4-16)		
Antidiabetic	11	16.2	11.09±3.48	(6-16)		
Antidepressant	10	14.7	11.50±3.98	(5-18)	F=0.731	0.537
Other	26	38.2	10.19±4.00	(2-16)		
Time elapsed since mastectomy surgery						
1-6 months	66	59.9	9.89±3.47	(2-18)		
7-12 months	32	29.2	10.69±3.52	(2-16)	F=0.679	0.510
≥ 13 months	12	10.9	10.58±3.09	(5-16)		
You have trouble sleeping						
Thinking	65	59.1	11.78±2.79	(6-18)	t=7.008	0.000**
Not thinking	45	40.9	7.89±2.97	(2-14)		
Electronic equipment in the sleeping room						
The one	48	43.6	10.81±3.42	(4-18)	t=1.681	0.096
Non	62	56.4	9.71±3.41	(2-16)		
Activity before sleeping (n=91)						
Watching TV/playing with a cell phone	78	85.5	10.38±3.31	(4-18)	t=-0.077	0.939
Other[b]	13	14.3	10.46±3.66	(2-16)		
When you wake up						
Feeling rested/energetic	44	40.0	8.93±3.05	(2-16)	t=-3.269	0.001*
Feeling tired	66	60.0	11.03±3.45	(2-18)		
Room to sleep						
Dark	63	57.3	10.25±3.76	(2-18)	t=0.222	0.825
Not dark	47	42.7	10.11±3.00	(2-16)		
Short-term sleep during the day						
Never	27	24.5	9.85±3.60	(2-16)		
Sometimes	52	47.3	10.13±3.61	(2-18)		
Often	18	16.4	10.94±3.49	(5-16)	F=0.378	0.769
Always	13	11.8	10.08±2.40	(6-15)		
Postoperative change in sleeping position						
The one	90	81.8	10.27±3.48	(2-18)	t=0.488	0.627
Non	20	18.2	9.85±3.31	(4-16)		
Change in sleep quality after surgery						
Sleep quality increasing	10	9.1	8.50±3.44	(2-12)		
Sleep quality declining	67	60.9	10.88±3.30	(5-18)	χ^2 =6.002	0.050
Unchanged	33	30.0	9.30±3.45	(2-16)		

[a]Other diseases; Asthma, heart, anemia.

[b] Other activities; Reading books, drinking milk, and taking a shower.

*p<0.05; **p<0.01

4. Discussion

The need for sleep, which is one of the basic human needs, varies depending on many factors such as the disease state, health status, age, and environmental conditions [21]. The most common side effects of cancer diagnosis and treatment in patients with breast cancer are fatigue, depression, and sleep disorder [22,23].

According to the results obtained from the research; The average PSQI score of the patients participating in the study after mastectomy was found to be 10.88 ± 3.30 (Table 1). In the study, it was determined that 89.1% of the patients had poor sleep quality according to the average score they got from the total PSQI scale (Table 1). Tell et al. exhibited (2014), that the average score obtained from the PSQI scale of breast cancer patients who had breast Conversing Surgery or mastectomy was found to be 8.1 ± 3.6 (117). In the study conducted by Taylor et al. (2012), it was found that 43% of patients with breast cancer experienced insomnia after surgery [24].

No statistically significant difference was found between the marital status, income status, educational status, people living with them, smoking and alcohol use status, and total PSQI scores of the patients participating in the study (Table 2). In other studies conducted on patients with breast cancer and mastectomy (Yılmaz, 2020; Pazarcıkcı, 2017), the difference between the marital status, education level, smoking, alcohol consumption status of the participants, family structure, with whom they live at home and their income status were not statistically significant [12,25].

In the study, the difference between the patients and age groups and the PSQI mean scores were not found to be significant (Table 2). That the time to fall asleep increases with age, and more frequent and rapid awakenings are observed compared to young adults [26,27]. In the study by Arslan and Fadıloğlu (2009), in which the sample group was different from breast cancer, the effect of sleep problems on the quality of life was examined, the difference between the age groups and the PSQI score averages was not statistically significant [28]. In this sense, our results are compatible with the literature.

In the present study, there was no significant difference in the PSQI mean scores of the patients living alone compared to the patients living with their spouses and children. Similarly, in the study conducted by Colagiuri et al. (2011), the difference between the PSQI mean scores between the patients living alone and married was not found to be statistically significant either [29]. Herein, no difference was found between the PSQI mean scores of patients with a different disease other than breast cancer and patients with any drug use. It is known in the literature that diseases and some medications affect sleep duration and sleep quality. For example, narcotic drugs, antidepressants, beta-blockers, and steroids delay the transition to REM sleep and cause a decrease in sleep quality. It has been stated that the disease state is a source of both physiological and psychological stress on individuals and this situation causes sleep disorders by affecting sleep [15,30].

We found no difference between the time elapsed after mastectomy surgeries and the PSQI mean scores. Yılmaz (2020) has demonstrated that there was no statistically significant difference was found between the PSQI score averages of the patients according to the type of breast surgery and the duration after diagnosis [12]. As known sleep disorders are more common in patients who receive cancer treatment for a long time compared to patients with newly diagnosed cancer [31]. In addition, it is thought that the spouse and family support of the patients and their adaptation to breast cancer may have an effect on their sleep quality.

Our results showed, that the difference between the PSQI mean scores of the patients who thought they had sleep problems after mastectomy and the patients who did not was found to be statistically significant (Table 3). Bower et al. (2011) found that 65% of the patients after breast cancer treatment had 5 points above the average PSQI score, that is, their sleep quality was "bad" [22]. Yılmaz (2020) presented it was found that 60% of breast cancer patients had low sleep quality [12]. The frequent

occurrence of sleep disturbances in patients with breast cancer can be thought to be due to symptoms that reduce the patient's quality of life such as depression, stress, anxiety, and fatigue that patients experience in the process of getting used to a new situation after surgery.

This study revealed that the average PSQI score of the patients who felt energetic and listened when they woke up was found to be significantly lower than the PSQI score average of the patients who felt tired when they woke (Table 3). Ekinci's (2016) study found that cancer patients with high levels of fatigue had worse sleep quality than patients with low levels of fatigue [32]. The frequent occurrence of fatigue in patients with breast cancer and its reflection on the quality of sleep suggests that the sleep problems and sleep disturbances experienced in patients after surgery are significant.

In the study, there was no difference between the PDQI mean scores and the state of having electronic equipment in the room where the patients slept, the darkness of the room they slept in, and the change in their sleeping position after surgery. Having a television in the bedroom delays bedtime and causes problems such as difficulty falling asleep and short-term sleep [33]. In the study of Aksu and Erdoğan (2017), it was stated that one of the factors that most affect patients' sleep is that the room is too bright [34]. Environmental factors affect sleep. The fact that the room where the patient sleep is dark enough and without noise facilitates the transition to sleep [15,35].

In our study, there was no statistically significant difference between the mean PSQI scores of patients with decreased postoperative sleep quality and patients who did not change their sleep quality after surgery and stated that sleep quality increased (Table 3). After surgical operations, patients often encounter sleep problems. Patients' postoperative pain, medications, and anxiety are some of the conditions that may cause sleep disturbance in the patient [36]. In patients with breast cancer after mastectomy, sleep disturbances are common due to Vargas et al (2014), it was found that 70.8% of patients with breast cancer experienced depression, stress, and anxiety, which causes a decrease in sleep quality in patients after surgery [10]. The study conducted a decrease in sleep quality and sleep disorders after surgery [37]. Onselen et al. (2013) evaluated sleep disturbances in breast cancer patients before and after surgery for six months and observed a slight decrease after an increase in sleep disturbances in the postoperative patients in the first period, but despite the decrease, sleep disturbance was found to be statistically significantly higher in patients [38]. In the study conducted by Fortner et al. (2002), the sleep quality of patients with breast cancer was evaluated with PSQI and it was found that 61% of the patients had low sleep quality [13].

5. Conclusion and Recommendations

As a result of the study, it was determined that almost all of the patients participating in the study had poor sleep quality. The information provided here about the patients' introductory characteristics, such as age, marital status, and income, put forth that it did not affect the sleep quality. It was determined that the characteristics of the patients' health conditions and sleeping habits affected the sleep quality, but not significantly. This study presented that there were changes in the sleeping habits of the patients after the surgery and these changes had negative effects on sleep quality. In order to evaluate the quality of sleep, experimental studies should be carried out with nursing interventions to increase the sleep quality of the patients, except for the subjective data obtained from the patient.

Limitations of the Research

The limitations of the study are that the study was conducted in the General Surgery Service of Abdurrahman Yurtaslan Oncology Hospital and that it was conducted with the patients that could be reached. The research is limited to the features measured by the measurement tools used and the answers given by the patients to these scales. The study was conducted only with patients who had a total and radical mastectomy.

Ethical statement:

Ethical approval was obtained from Yıldırım Beyazıt University's Ethical Committee (Date:13/11/2019; Number: 23). Written permission was obtained from Dr. Abdurrahman Yurtaslan Ankara Oncology Training and Research Hospital (17/12/2019-84) for the implementation of the study Before starting the application, the purpose of the study was explained to the patients included in the study, and informed consent was obtained by giving information about the study. Written permission was obtained via e-mail from the person who conducted the Turkish validity and reliability study of the Pittsburg Sleep Quality Index to use the scale.

Acknowledgments:

The authors are grateful to the nurses who participated in this study.

Conflicting of Interest:

The authors declared no potential conflicts of interest concerning the research, authorship, and/or publication of this article.

Funding:

The author(s) received no financial support for the research and/or authorship of this study.

Authors' Contributions:

S. K: Conceptualization (%50), Methodology (%50), Analysis (% 50), Resources (%50), Investigation (%100), Writing - Original draft preparation (% 60)

N.Ü.D: Conceptualization (%50), Methodology (%50), Analysis (%50), Resources (%50), Writing - Original draft preparation (% 40)

All authors read and approved the final manuscript

References

[1] World Health Organization (2022). *Cancer 25 March 2022* [Online]. Available: https://www.who.int/cancer/en/.

[2] American Institute for Cancer Research (25 March 2019). *Worldwide Cancer Data, Global Cancer Statistics For The Most Common Cancers* [Online]. Available: https://www.wcrf.org/dietandcancer/cancer-trends/worldwide-cancer-data.

[3] T.C. Ministry of Health (2017). *General Directorate of Public Health, Turkey Cancer Statistics*[Online]. Available: https://hsgm.saglik.gov.tr/depo/birimler/kanser-.

[4] Bener A, Alsulaiman R, Doodson L, Agathangelou T. , "Depression, hopelessness and social support among breast cancer patients: in highly endogamous population", *Asian Pacific Journal of Cancer Prevention*, 18(7), 1889–1896, 2017. Doi: 10.22034/APJCP.

[5] Heidari, M., & Ghodus, "M. The relationship between body esteem and hope and mental health in breast cancer patients after mastectomy", *Indian Journal of Palliative Care* 21(2) ,198–202, 2015. Doi: 10.4103/0973-1075.156500. .

[6] Freysteinson WM, Deutsch AS, Lewis C, Sisk A, Wuest L, Cesario SK., "The experience of viewing oneself in the mirror after a mastectomy", *Oncology Nursing Forum*, 39(4),361-369, 2012. Doi: 10.1188/12.ONF.361-369.

[7] Kurtar, S., & Dinçer, N.Ü. "Nursing care literature review after mastectomy in Turkey", *International Social Sciences Studies Journal*, 60,1462-1470, 2020. Doi:10.26449/sssj.2228.

[8] Yeşilyurt, D.S., & Fındık, Ü.Y. "Informational needs of postmastectomy patients", *Journal Breast Health*, 12(4), 155–157, 2016. Doi: 10.5152/tjbh.2016.3062.

[9] Beverly CM, Naughton MJ, Pennell ML, Foraker RE, Young G, Hale L, Feliciano EMC, Pan K, Crane TE, Danhauer SC, Paskett ED., "Change in longitudinal trends in sleep quality and duration following breast cancer diagnosis: results from the women's health initiative", *NPJ Breast Cancer*, 29(4), 4-15, 2018, Doi: 10.1038/s41523-018-0065-7.

[10] Laura Q Rogers, Kerry S Courneya, Robert A Oster, Philip M Anton, Randall S Robbs, Andres Forero, Edward McAuley, "Physical activity and sleep quality in breast cancer survivors: a randomized trial", *Medicine Science Sports Exercise*, 49(10), 2009–2015, 2017. Doi: 10.1249/MSS.0000000000001327.

[11] Kurt, S., & Enç, N., "Sleep problems and nursing care in intensive care patients", Turkish Society of Cardiology Journal of Cardiovascular Nursing,4(5), 1-8, 2013. Doi: 10.5543/khd.2013.001.

[12] Yılmaz, M., "Evaluation of sleep disorders in nonmetastatic breast cancer patients based on Pittsburgh sleep quality index", *Journal of Cancer Research and Therapeutics*, 16(6), 1274-1278, 2020. Doi: 10.4103/jcrt.JCRT_1036_19.

[13] Fortner, B.V., Stepanski, E.J., Wang, S.C., Kasprowicz, S., & Durrence, H.H., "Sleep and Quality of Life In Breast Cancer Patients", *Journal of Painand Symptom Management*, 24(5), 471-480, 2002. Doi: 10.1016/s0885-3924(02)00500-6.

[14] Velioğlu, P., *Concepts and Theories in Nursing*, Akademi, İstanbul, 2012.

[15] Akdemir, N., & Birol, L., *Internal Medicine and Nursing Care*, Nobel, Ankara, 2011.

[16] McLain JM, Alami WH, Glovak ZT, Cooley CR, Burke SJ, Collier JJ, Baghdoyan HA, Karlstad MD, Lydic R., "Sleep fragmentation delays wound healing in a mouse model of type 2 diabetes, *Sleep Search Society*, 41(11), 155-156, 2018. Doi: 10.1093/sleep/zsy156.

[17] Erdost, Ş.K., & Çetinkale, O. *Wound care and treatment,* Istanbul University Cerrahpasa Faculty of Medicine Continuing Medical Education Activities Symposium Series No:67, İstanbul, 2008, pp. 187-225.

[18] Erdemir, F., *Nursing Diagnostics Handbook*, Nobel, Ankara, 2012.

[19] Buysse DJ, R. C., "The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. *Psychiatry Research*, 28(2), 193-213,1989. Doi: 10.1016/0165-1781(89)90047-4

[20] Mehmet Yücel Ağargün, H.K., "The validity and reliability of the Pittsburgh sleep quality index", *Turkish Journal of Psychiatry*,7(2), 107-111, 1996. Doi: 10.33715/inonusaglik.

[21] Yilmaz D, Tanrikulu F, Dikmen Y., "Research on sleep quality and the factors affecting the sleep quality of the nursing students", *Current Health Science Journal*, 43(1), 20-24, 2017. Doi: 10.12865/CHSJ.43.01.03.

[22] Bower JE, Ganz PA, Irwin MR, Kwan L, Breen EC, Cole SW., "Inflammation and behavioral symptoms after breast cancer treatment: do fatigue, depression, and sleep disturbance share a common underlying mechanism?" *Journal of Clinical Oncology*, 29(26), 3517–3522, 2011. Doi: 10.1200/JCO.2011.36.1154.

[23] Fakih, R., "Prevalence and severity of sleep disturbances among patients with early breast cancer", *Indian Journal of Palliative Care*, 24(1), 35–38, 2018. Doi: 10.4103/IJPC.IJPC_137_17

[24] Taylor, T.R. and friends., "Understanding sleep disturbances in African-American breast cancer survivors: a pilot study", *Psychooncology*, 21(8), 896–902, 2012. Doi: 10.1002/pon.2000.

[25] Pazarcıkcı, F., "Evaluation of sleep quality in cancer patients receiving chemotherapy", *Journal of Mehmet Akif Ersoy University Institute of Health Sciences*, 5(1), 11-21, 2017. Doi:https://doi.org/10.24998/maeusabed.292260.

[26] Berman, A.T., Snyder C., Frandsen G., Synder, S. *Kozier & Erb's, Fundamental of Nursing, Concepts, Process, Practice*. Pearson, London, 2016.

[27] Madrid-Valero JJ, Martínez-Selva JM, Ribeiro do Couto B, Sánchez-Romera JF, Ordoñana JR., "Age and gender effects on the prevalence of poor sleep quality in the adult population", *Gaceta Sanitaria*, 31(1), 18-22, 2017, Doi: 10.1016/j.gaceta.

[28] Arslan, S., & Fadıloğlu, Ç., "The effect of sleep problems on quality of life in cancer", *Journal of Research and Development in Nursing*, 11(2), 16-27, 2009.

[29] Colagiuri, B., & Søren Christensen, M. B., "Prevalence and predictors of sleep difficulty in a national cohort of women with primary breast cancer three to four months postsurgery", *Journal of Pain and Symptom Management*, 42(45), 710-20, 2011, Doi: 10.1016/j.jpainsymman.2011.

[30] Ertuğrul, A., & Rezaki, M., "Neurobiology of sleep and its effects on memory", *Turkish Journal of Psychiatry*,15(4), 300-308, 2004, Doi: 10.1016/j.nlm.2006.03.005.

[31] Lafcı, D., "Breast cancer, sleep and music therapy", *Journal of Uludag University Faculty of Medicine*, 44(1), 61-64, 2018.

[32] Ekinci, Y., Determination of Factors Affecting Fatigue in Cancer Patients, Master Thesis, Hacettepe University Institute of Health Sciences, Ankara, 2016.

[33] Garrison, M.M. and friends, "Media use and child sleep: the impact of content, timing, and environment", *Pediatrics*, 128(1), 29-35, 2011. Doi: 10.1542/peds.2010-3304.

[34] Aksu, N.T., & Erdoğan, A., "Evaluation of sleep quality in patients who underwent lung resection", *Journal of Turkish Sleep Medicine*,4(2), 35-42, 2017. DOI: 10.4274/jtsm.76486

[35] Yılmaz, H., & Tuncel, D. (2014). *Treatment Guide for Sleep Disorders* [Online]. Available: Doi:https://www.noroloji.org.tr/TNDData/Uploads/files/uyku%20bozukluklar%C4%B %202014.

[36] Hillman, D.R., "Postoperative sleep disturbances understanding and emerging therapies", *Elsevier Mosby*, 35(1), 1-24, 2017, Doi: 10.1016/j.aan.2017.07.001.

[37] Vargas S, Antoni MH, Carver CS, Lechner SC, Wohlgemuth W, Llabre M, Blomberg BB, Glück S, DerHagopian RP., "Sleep quality and fatigue after a stress management ınterventıon for women with early-stage breast cancer in southern florida", *International Journal of Behavioral Medicine*, 21(6), 971–981, 2014. Doi: 10.1007/s12529-013-9374-2.

[38] Van Onselen C, Paul SM, Lee K, Dunn L, Aouizerat BE, West C, Dodd M, Cooper B, Miaskowski C., "Trajectories of sleep disturbance and daytime sleepiness in women before and after surgery for breast cancer", *Journal of Pain Symptom Manage*, 45(2), 244–260, 2013. Doi: 10.1016/j.jpainsymman.2012.02.020.

International Journal of Health Services Research and Policy
www.dergipark.org.tr/ijhsrp
IJHSRP
e-ISSN: 2602-3482

Research Article

INVESTIGATION OF SOME MICROBIAL AGENTS IN VAGINAL AND ENDOSERVIX SWAP SAMPLES OF 18 – 50 AGED WOMEN WITH VAGINAL DISCHARGE

***Remziye İÇEN*[1] *Nezahat AKPOLAT*[1] *Nida ÖZCAN*[1*] *Salim YAKUT*[2] *Fatih ÇAKIR*[1] *Elif AĞAÇAYAK*[3] *Cemile SÖNMEZ*[4]**

[1]Dicle University Faculty of Medicine, Dept. of Medical Microbiology, Diyarbakır, Turkey
[2]Bingöl State Hospital, Laboratory of Microbiology, Bingöl, Diyarbakır
[3] Dicle University Faculty of Medicine, Dept. of Gynecology, Diyarbakır, Turkey
[4] Turkish Public Health Institution, Ankara, Turkey
*Corresponding author; nida.ozcan@dicle.edu.tr

Abstract: *Detecting sexually transmitted infectious agents in women by traditional methods is often troublesome. This study aimed to investigate bacterial vaginosis and vaginitis agents by culture, microscopic examination, and molecular methods in women with vaginal discharge complaints. A total of 100 female patients aged 18-50 years, who applied to Dicle University Obstetrics and Gynecology outpatient clinic with the complaint of vaginal discharge, were included in the study. Gram and Giemsa staining, culture, and multiplex polymerase chain reaction (PCR) processes were performed from vaginal and endocervix samples taken with sterile swabs. Gram-stained specimens were evaluated with the Nugent score; the presence of leukocytes with polymorph nuclei, Clue-Cells, and different shaped bacteria. Culture-grown agents were identified at the species level by mass spectrometry. There was at least one microbial agent in 63% of the samples included in the study. According to Nugent scores, 27 specimens were determined positive, and 39 specimens had intermediate values for bacterial vaginosis(BV). Candida species (29%), Streptococcus agalactiae (9%), and Staphylococcus aureus (3%) grew in culture while Mycoplasma hominis (23%), Ureaplasma urealyticum (13%), Trichomonas vaginalis (9%) and Chlamydia trachomatis (3%) were detected by multiplex PCR. In our study, it was determined that vaginal discharge could be caused by bacterial, fungal, and parasitic microorganisms as well as bacterial vaginosis agents. It is very difficult, laborious, and necessary to determine dysbiosis and infection in the vagina which has an important microbiome. Gram staining and culture methods are insufficient for the detection of vaginal infection agents. Therefore, it would be beneficial to use molecular methods in addition.*

Keywords: *Bacterial vaginosis, Vaginitis, Candida species., Multiplex polymerase chain reaction, Mycoplasma*

Received: September 30, 2021 Accepted: April 01, 2022

1. Introduction

The vaginal microbiota consists predominantly of lactobacilli in the period between puberty and menopause. Decreased lactobacilli population and changes in microbiota may cause symptomatic problems. The most common dysbiosis of the vaginal microbiota is an anaerobic polymicrobial dysbiosis which is named bacterial vaginosis (BV). Other conditions related to vaginal inflammation are vaginal candidiasis, trichomoniasis, inflammatory and atrophic vaginitis [1]. The predominance of *Streptococcus*, *Staphylococcus*, or *Enterobacterales* bacteria in the vaginal microbiota are also

considered dysbiotic conditions [2]. Our knowledge about various types of dysbiosis and their association with urogenital disease burden increased in the last decades with non-culture-based techniques [3]. Vaginal dysbiosis is related to increased susceptibility and transmission risk to *Human Immun Deficiency Virus (HIV)* and other sexually transmitted infections such as pelvic inflammatory disease (PID). Particularly in women aged 18-50 years, these infections are associated with preterm delivery and an increased risk of maternal and newborn infections [4- 6]. Molecular epidemiological studies have revealed that the lactobacilli-dominated vaginal flora was closely related to an immune-tolerant balanced microbiota. However, studies indicate that not all *Lactobacillus species* were the same in terms of their effect on the microbiota. The presence of *Lactobacillus crispatus (L. crispatus)* was associated with the absence of mucosal inflammation, while *Lactobacillus iners* (*L. iners*) was reported to accompany anaerobes and pathogens causing dysbiosis[2].

Available epidemiological data for assessing the burden of vaginal dysbiosis and associated clinical conditions are largely based on the Amsel criteria and/or the Nugent score [3]. Molecular studies define bacterial vaginosis as polymicrobial dysbiosis of the vagina[2]. Nugent score and vaginal pH were consistent with molecular studies in demonstrating dysbiosis, whereas Amsel criteria were not. However, it should be noted that Nugent scoring cannot distinguish between *Lactobacillus species*[3]. Additional laboratory methods should be used to detect clinically different dysbiotic conditions. PID was thought to be predominantly caused by *Chlamydia trachomatis (C. trachomatis)* and *Neisseria gonorrhoeae (N. gonorrhoeae)*, and in some cases by BV-associated organisms and *Mycoplasma genitalium (M. genitalium)* [1]. Increasing studies have found that *N. gonorrhoeae, C. trachomatis*, and/or *M. genitalium* were associated with approximately 30% of PID cases. However, BV-associated bacteria or urogenital pathobionts - *Streptococcus agalactiae (S. agalactiae), Staphylococcus aureus (S. aureus),* and *Enterobacterales* - were found in 70% of PID cases [1], [7]. Vaginal dysbiosis and its sequelae are common worldwide. Women with symptoms such as unusual vaginal discharge, unusual odor, and/or vaginal itching receive empirical antibiotic and/or antifungal therapy. However, appropriate diagnostic tests will enable effective treatment to begin sooner [8].

In our study, we aimed to investigate the microorganisms causing dysbiosis, especially BV and vaginitis in women who applied with the complaint of vaginal discharge.

2. Materials And Methods

Approval of this study was obtained from the Dicle University Faculty of Medicine Non-Invasive Ethics Committee with the number 141 on 19.02.2018. Informed consent was provided by all the participants of the study.

A total of 100 patients aged 18-50 years, who applied to the Dicle University Hospital, Obstetrics and Gynecology outpatient clinic between 04 July 2018 and 30 August 2018 with vaginal discharge, were included in the study. Patients who had vaginal bleeding and/or used antibiotics at least 72 hours before were excluded. Vaginal and cervical swab samples taken by the obstetrician were transferred to the microbiology laboratory within one hour. Fresh preparations for direct microscopy and Gram and Giemsa staining preparations were prepared from the vaginal swab sample. Vaginal samples were inoculated on Sabouraud dextrose agar (SDA) and 5% Sheep Blood Agar (SBA). One of the cervical swabs was undergone for PCR studies while the other swab was inoculated on SBA and chocolate agar. The SDA and SBA mediums were incubated aerobically while chocolate agars were kept in a 5-10% CO2 environment. After incubation, all grown isolates were identified by MALDI-TOF MS (Matrix-assisted laser desorption ionization time of flight mass spectrometry) with Maldi Biotyper (Bruker Daltonics, USA).

The Allplex™ STI Essential Assay (Seegene, Korea), a commercial multiplex Real-Time PCR test, was used to detect *C. trachomatis, N. gonorrhoeae, Trichomonas vaginalis (T. vaginalis), M.*

genitalium, M. hominis, U. urealyticum and *U. parvum* in swab samples. Nucleic acid isolation for Multiplex PCR was performed manually using the RibospinTM vRD (GeneAll Biotechnology, Korea) kit according to the classical spin column method.

Fresh preparations were examined at 400 magnification for the presence of *T. vaginalis* trophozoites, leukocytes, yeasts, and pseudohyphae. *T.vaginalis* trophozoites were also investigated in Giemsa-stained smears.

Gram-stained smears were evaluated according to Nugent scoring (Table 1); the presence of clue cell (clue-cell), budding yeast, and pseudohyphae structures and leukocytes were examined. The Nugent scoring method varies between 0 and 10 according to the relative amount of bacterial morphotypes; smears with a total score of ≥7 are considered compatible with bacterial vaginosis, scores between 0 and 3 are considered normal, and scores between 4 and 6 are considered intermediate values [9-10].

Table 1. Evaluation of Gram-stained microscopy of the vaginal swab in the diagnosis of bacterial vaginosis (Nugent scoring) [10]

Morpho type	Number/field	Score
Lactobacillus - like, parallel-sided, Gram-positive rods	>30	0
	5-30	1
	1-4	2
	<1	3
	0	4
Mobilincus-like, curved Gram-negative rods	5	2
	1-4	1
	0	0
Gardnerella/Bacteroides - like tiny, Gram-variable coccobacilli/pleomorphic rods	>30	4
	5-30	3
	1-4	2
	<1	1
	0	0
Evaluation of the Nugent Scoring System		
Total score:0-3	Normal	
Total score:4-6	Intermediate	
Total score:7-10	Bacterial Vaginosis	

Study data were analyzed in the SPSS 16.0 program. Chi-square test was used for the relationship between Nugent score, age, clue cell, polymorphonuclear leukocytes (PMNs), and possible causes of dysbiosis. $p<0.05$ value was considered statistically significant. One-way analysis of variance and a Post-hoc Tukey test was applied for age.

3. Results

Fifteen of the patients were between the ages of 18 and 25, and 85 of them were between the ages of 26 and 49. At least one microorganism was determined by culture and/or PCR method in 63 swab samples of 100 patients examined, and no agent was detected in 37 of them. Two or more agents were detected in 23 of the patients. The total number of agents isolated from all patients was 94. The microorganisms detected by culture and PCR methods and their distribution according to two age groups are given in Table 2.

Table 2. Distribution of Microorganisms Detected by Culture and Multiplex PCR Methods by 18-25 and 26-49 Age Groups

	18-25 age group (15 women) n	**26-49 age group (85 women) n**
C. trachomatis[1]	1	2
T. vaginalis[1]	1	8
M. hominis[1]	2	1
U. urealyticum[1]	1	1
Candida spp[2]	4	1
S. agalactiae[2]	0	1
S. aureus[2]	1	
G. vaginalis[2]	1	

[1] *: Detected by PCR method,* [2]*: Detected by culture method*

According to the Nugent score, 27 of 100 patient samples were evaluated as positive and 39 as intermediate. While 26 of the Nugent score positive patients were between the ages of 26-and 49, one patient was between 18-and 25. Nugent score-age relationship was found to be statistically significant. Nugent score distribution by age is given in Table 3.

Table 3. Distribution of Nugent Score by Age

	Nugent Scoring			
	Negative(n=34) **X̄± SD**	Intermediate(n=39) **X̄± SD**	Positive (n=27) **X̄± SD**	p
Age group	32,4±7,27	34,3±8,52	37,4±6,9	0,046*

* p<0.05

Clue cells were seen in 84 smear samples (Figure 1) while PMNs were detected in Gram-stained smears of 68 patients (Table 4). *T. vaginalis* was detected in direct examination of 1 smear sample.

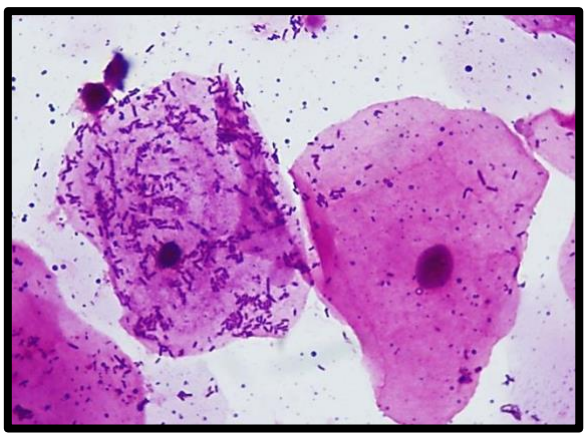


Figure 1. Clue cell in a Gram-stained smear

Table 4. The presence of clue cells, polymorphonuclear leukocytes (PMNs), and Nugent Score by Age Groups

	18-25 age group (n=15) n (%)	26-49 age group (n=85) n (%)	p	Total
Clue cell				
Negative	12 (80,0)	72 (84,7)		84(%84)
Positive	3 (20,0)	13 (15,3)	0,704	16(%16)
PMNs				
Negative	5 (33,3)	27 (31,8)		32(%32)
Positive	10 (66,7)	58 (68,2)	0,899	68(%68)
Nugent Scoring				
Negative	6 (40,0)	28 (32,9)		34(%34)
Intermediate	8 (53,3)	31 (36,5)	0,148	39(%39)
Positive	1 (6,7)	26 (30,6)		27(%27)

One-way analysis of variance and a Post-hoc Tukey test was applied for age.
PMNs: polymorphonuclear leukocytes, $p<0.05$ was considered significant

Statistical analysis between vaginal smear Nugent score and presence of *C. trachomatis, N.gonorrhoeae, T. vaginalis, M. genitalium, M. hominis, U. urealyticum, Candida spp.* and *S. agalactiae* are given in Table 5. Culture grown microorganisms are shown in Table 6. *N. gonorrhoeae* and *M. genitalium* were not detected by PCR analysis of any of the patients. Microorganisms detected by PCR analysis are shown in Table 7.

Table 5. The relationship between Nugent score and the presence of microorganisms, Clue cells and polymorphonuclear leukocytes (PMNs)

	NUGENT SCORING			
	Negative n (%)	**Intermediate n (%)**	**Positive n (%)**	**p**
Chlamydia trachomatis				
Negative	32 (94,1)	39 (100,0)	26 (96,3)	0,329
Positive	2 (5,9)	0 (0,0)	1 (3,7)	
Trichomonas vaginalis				0,554
Negative	32 (94,1)	34 (87,2)	25 (92,6)	
Positive	2 (5,9)	5 (12,8)	2 (7,4)	
Mycoplasma hominis				
Negative	30 (88,2)	31 (79,5)	16 (59,3)	0,025*
Positive	4 (11,8)	8 (20,5)	11 (40,7)	
Ureoplasma urealyticum				
Negative	27 (79,4)	34 (87,2)	26 (96,3)	0,150
Positive	7 (20,6)	5 (12,8)	1 (3,7)	
Clue cell presence				
Negative	32 (94,1)	37 (94,9)	15 (55,6)	0.001**
Positive	2 (5,9)	2 (5,1)	12 (44,4)	
PMNs presence				
Negative	14 (41,2)	12 (30,8)	6 (22,2)	0,282
Positive	20 (58,8)	27 (69,2)	21 (77,8)	
Candida species				
Negative	23 (67,6)	28 (71,8)	19 (70,4)	0,927
Positive	11 (32,4)	11 (28,2)	8 (29,6)	
Streptococcus agalactiae				
Negative	31 (91,2)	34 (87,2)	26 (96,3)	0,445
Positive	3 (8,8)	5 (12,8)	1 (3,7)	

Chi-square test; * $p<0.05$; ** $p<0.01$; PMNs: Polymorphonuclear leukocytes

Table 6. Distribution of culture-grown microorganisms in vaginal swab samples

Microorganisms	Number (%)
Candida albicans	21 (21)
Candida dubliniensis	2 (2)
Candida glabrata	4 (4)
Candida lusitaniae	1 (1)
Candida krusei	1 (1)
Streptococcus agalactiae	9 (9)
Staphylococcus aureus	3 (3)
Streptococcus anginosus	1 (1)
Gardnerella vaginalis	1 (1)
Streptococcus disgalactia	1 (1)
Staphylococcus haemolyticus	1 (1)

Table 7. Microorganisms detected by PCR Method, presence of PMNs, and clue cell

Microorganism	(number)	PMNs presence	Clue cell presence
Mycoplasma hominis	(23)	15	7
Ureaplasma urealyticum	(13)	8	2
Trichomonas vaginalis	(9)	4	0
Chlamydia trachomatis	(3)	2	0

PMNs: Polymorphonuclear leukocytes

4. Discussion

The most common complaint of female patients regarding the genital system is vaginal discharge. Infection is one of the leading causes of pathological vaginal discharge. Female genital tract infections can be classified as vulvovaginitis, pelvic inflammatory disease, or exogenous/endogenous infections according to the site of infection. Exogenous genital tract infections are caused by sexually transmitted agents while endogenous infections are caused by endogenous agents after disruption of the vaginal flora. Approximately 90% of women presenting with vaginal discharge have vaginitis; about 40% of vaginitis are reported as BV, 25% as vulvovaginal candidiasis, and 2% as trichomoniasis [11], [12]. Until recently, the diagnosis of bacterial vaginosis was only based on microscopy-based Nugent scoring or Amsel criteria. The development of non-cultural methods has allowed many studies to be conducted and the methods to be compared. Dols JA et al. [13] used the Nugent scoring method with three molecular-based methods in the evaluation of BV. They stated that *L. iners and L. crispatus* or both bacteria clusters were dominant in the vaginal flora of patients without BV, and they especially emphasized that *L.crispatus* was associated with healthy vaginal flora. However, they also stated that *L.crispatus* was not solely responsible for the protection of the flora. In the same study, researchers defined three separate bacterial clusters in BV-positive patients and reported the bacterial profiles in the cluster as anaerobic bacteria dominance with high species diversity[13]. Gram stain and Nugent scoring maintain their importance in the diagnosis of BV, and its sensitivity was reported to be 93-97% [14], [15]. Studies conducted in Turkey reported the prevalence of BV in women with vaginal discharge as 21.2% - 35.8% [16], [17]. The BV rate in our study was 27%, and it was found to be compatible with the results of the studies conducted with the same method. Risk factors thought to be associated with BV include age, age at menarche, duration of menstruation, and sexual activity. BV is most common in the reproductive age which lasts from menarche to menopause [17], [18]. The mean age of patients with a positive Nugent score was found to be 37.4 ± 6.9 and it was statistically significant compared to the

other age groups (P= 0.046). Although Amsel's criteria were reported as a practical method in the diagnosis of BV, it had limitations in diagnosis and was found to be incompatible with molecular methods. The sensitivity and specificity of Amsel's criteria have been reported as 75.0% and 50.8%, respectively [19]. In a study conducted by Şahin N.N [17], it was pointed out that the criteria other than clue cell positivity of Gram staining were not reliable, since it was difficult to evaluate the pH and odor of vaginal discharge in various situations. In the same study, the sensitivity and the specificity of clue cell positivity were determined as 84.7% and 96.5%, respectively for the diagnosis of BV in patients with positive Nugent scoring. In the current study, clue cell absence was found in 94.1% of the Nugent-negative group (P=0), while 44.4% of the Nugent-positive group showed clue cell positivity. In particular, the absence of clue cells was noted as an even more reliable marker for detecting BV negativity.

In our study, *Candida species* were found to be the most isolated microorganisms in vaginal cultures. Of the 29 isolated *Candida spp* isolates, 21 were *C. albicans*. Eight of the patients with vaginal candidiasis were accompanied by BV. Our study was compatible with previous studies. Albayrak et al [20] reported that Candida species grew in 28% of the vaginal cultures of 300 women aged 18-60 years. Kalkancı et al.[21] isolated *Candida spp.* in 16.4% of a total of 567 vaginal swab samples. In another study, *Candida species* were isolated in 266 (33.2%) of 801 patients, and the most frequently isolated species was *C. albicans* (61.7%)[22]. Vulvovaginal candidiasis has been reported to be the most common dysbiotic condition after BV. It was reported that 75% of women have experienced vulvovaginal candidiasis at least once in their lifetime[7]. Since susceptibility profiles differ according to Candida species, empirical treatment is not recommended unless there is a positive vaginal culture and clinical findings[23].

T. vaginalis is a sexually transmitted protozoan that causes infection in the vagina. The infection may spread through the lymph nodes to the hypogastric area of the pelvis. The increased numbers of PMNs seen on the fresh smear samples of vaginal discharges indicate inflammation[23]. Although the direct microscopic examination is a fast and cheap method with high specificity, its sensitivity varies between 58-and 82%[20]. The sensitivity of the method varies with the time from sampling to examination, the number of parasites, and the experience of the examiner [24]. In the current study, among 9 (9%) samples detected by PCR, only one was detected by direct examination and two by Giemsa staining. The prevalence of trichomoniasis ranges from 3% to 40%. The socio-economic level of the studied groups and the methods used are the main factors affecting the prevalence. In studies conducted in Düzce, Ankara, and Hatay, the prevalence of 13.4%, 4.9%, and 2.18% were reported, respectively [25–27].

Aerobic or facultative anaerobic vaginitis was first defined by Donders in 2002 as a type of vaginal infection caused by aerobic bacteria. Although its pathogenesis remains unclear, colonization of *Escherichia coli, Streptococcus spp., Enterococcus faecalis*, *Staphylococcus spp. (S.aureus,* and Coagulase-Negative Staphylococci such as *S. epidermidis*) have been reported in these patients. Detecting aerobic vaginitis is important to prevent complications (such as rupture of membranes, preterm labor, and chorioamnionitis in pregnant women, pelvic inflammatory disease in non-pregnant women) and to apply the appropriate treatment[28]. Studies investigating the frequency of *S. agalactia* / *Group B Streptococcus* (GBS) in our country varied according to the patient groups included in the study and whether the patients were pregnant or not. Pregnant women were not included in our study, and GBS was grown in the culture of 10% of the vaginal samples. In a study conducted in İstanbul, vaginal cultures of women using and not using an intrauterine device (IUD) were evaluated. GBS grew in 6% (3/30) of the vaginal cultures in the IUD using group and in 4% (2/28) of the vaginal cultures of those who did not use the IUD [29]

Molecular methods contribute to the easy and rapid identification of microorganisms that do not grow easily in culture media or that require special growth media. In our study, we detected *M.hominis* in 23 of 100 samples, *U. urealyticum* in 13, *T. vaginalis* in 9 and *C. trachomatis* in 3 samples by multiplex PCR method. A study in Australia investigated bacterial and viral cervicitis agents by multiple PCR. In 233 cervical specimens from 175 patients, *U. parvum*, *M. hominis*, *U. urealyticum*, *M. genitalium*, and *C. trachomatis* were detected in 57%, 13.7%, 6.1%, 1.3%, and 0.4%, respectively[30]. Large and controlled studies are needed on the role of agents detected by molecular methods in infections. The prevalence of genital mycoplasma infection has been reported as 30-40% in various studies. Co-infection was frequently reported in genital infections[31]. Our study was compatible with previous publications. Among the samples of symptomatic patients in our study, PMNs were observed in 16 of 23 samples with *M. hominis* while PMNs were not detected in 7 samples. In the current study, *U. urealyticum* (in 5 samples), *T. vaginalis* (in 5 samples), *Candida spp*. (in 4 samples), and *C. trachomatis* (in 1 sample) were detected simultaneously with *M. hominis*.

The strength of our study was the investigation of multiple infectious agents using the molecular method in addition to culture and microscopic methods. The limitation of our study was the small number of samples obtained over a two-month period. Another limitation was the inability to culture some agents that required specific culture media, such as *Mycoplasma* and *Ureaplasma species.*

5. Conclusion

This descriptive study revealed that various bacterial, fungal, and parasitic agents may cause vaginal discharge. Multiplex PCR methods will facilitate the detection of agents - especially those that can't be cultured or require specific media- in routine diagnostic laboratories. The regional distribution of the agents and their presence in the urogenital flora may differ. More comprehensive studies are needed on the microbiota distribution of the agents and their ability to cause infections.

Acknowledgments

This study was funded by Dicle University Scientific Research Projects Coordinatory with the Project number Tıp.18.015.

Ethical statement

The current study was carried out in accordance with research and publication ethics rules. Approval of this study was obtained from the Dicle University Faculty of Medicine Non-Invasive Ethics Committee with the number 141 on 19.02.2019.

Conflict of interest

The authors have no conflict of interest.

Authors' Contributions

NA conducted the study, EA provided samples from patients, Rİ and SY carried out conventional processing of samples, CS carried out molecular tests, F.Ç analysed the test reports and NÖ wrote the article.

References

[1] Aral, S. O., Fenton, K. A., Holmes, K. K. "Sexually transmitted diseases in the USA: temporal trends," *Sex. Transm. Infect.*, 83(4), 257, 2007. Doi: 10.1136/STI.2007.026245

[2] van de Wijgert, J.H.H.M., Borgdorff, H., Verhelst, R., Crucitti, T., Francis, S., Verstraelen, H., Jespers, V. "The Vaginal Microbiota: What Have We Learned after a Decade of Molecular Characterization?," *PLoS One*, 9(8),e105998, 2014. Doi: 10.1371/JOURNAL.PONE.0105998

[3] van de Wijgert, J.H.H.M., Jespers, V. "The global health impact of vaginal dysbiosis," *Res. Microbiol.*, 168(9–10), 859–864, 2017. Doi: 10.1016/J.RESMIC.2017.02.003

[4] van de Wijgert, J.H.H.M. "The vaginal microbiome and sexually transmitted infections are interlinked: Consequences for treatment and prevention," *PLoS Med.*, 14(12), 2017. Doi: 10.1371/JOURNAL.PMED.1002478

[5] Low, N., Chersich, M.F., Schmidlin, K., Egger, M., Francis, S.C., van de Wijgert, J.H.H.M., et al. Intravaginal practices, bacterial vaginosis, and HIV infection in women: individual participant data meta-analysis. *PLoS Med*.,8(2),e1000416, 2011. Doi: 10.1371/JOURNAL.PMED.1000416

[6] van de Wijgert, J.H.H.M., Morrison, C.S.,Cornelisse, P.G.,Munjoma, M.,Moncada, J.,Awio, P., et al. "Bacterial vaginosis and vaginal yeast, but not vaginal cleansing, increase HIV-1 acquisition in African women," *J. Acquir. Immune Defic. Syndr.*, 48(2), 203–210, 2008. Doi: 10.1097/QAI.0B013E3181743936

[7] Li, J., McCormick, J., Bocking, A., Reid, G. "Importance of vaginal microbes in reproductive health," *Reprod. Sci.*, 19,(3), 235–242, 2012. Doi: 10.1177/1933719111418379

[8] Amsel, R., Totten, P.A., Spiegel, C.A., Chen, K.C., Eschenbach, D., Holmes, K.K. "Nonspecific vaginitis. Diagnostic criteria and microbial and epidemiologic associations," *Am. J. Med.*, 74(1), 14–22, 1983. Doi: 10.1016/0002-9343(83)91112-9

[9] Nugent, R.P., Krohn, M.A., Hillier, S.L. "Reliability of diagnosing bacterial vaginosis is improved by a standardized method of gram stain interpretation," *J. Clin. Microbiol.*, 29(2) 297–301, 1991. Doi: 10.1128/JCM.29.2.297-301.1991

[10] Klinik Mikrobiyoloji Uzmanlık Derneği, Klinik Örnekten Sonuç Raporuna Uygulama Rehberi-Genital Sistem Örnekler, Ankara, Turkey, 2019.

[11] Usluer, G., Vaginal Enfeksiyonlar, in *İnfeksiyon Hastalıkları ve Mikrobiyolojisi*, (Eds. A. Willke, G. Söyletir, and M. Doğanay), Nobel Tıp Kitabevleri, İstanbul, 2002, pp. 79–84.

[12] Zarakolu, I. P., Tuncer, A., Yıldız, M., Akbayrak, H. "Bakteriyel Vaiinozisin Laboratuvar Tanısında Gram Boyama Yönteminin Geçerliliği," *Mikrobiyol. Bul.*, 32, 195–199, 1998.

[13] Dols, J.A., Molenaar, D., van der Helm, J.J., Caspers, MP., de Kat Angelino-Bart, A., Schuren, F.H., et al. "Molecular assessment of bacterial vaginosis by Lactobacillus abundance and species diversity," *BMC Infect. Dis.*, 16(1), 180, 2016. Doi: 10.1186/S12879-016-1513-3

[14] Sha, B., Chen, H., Wang, Q., Zariffard, M., Cohen, M., Spear,G. "Utility of Amsel criteria, Nugent score, and quantitative PCR for Gardnerella vaginalis, Mycoplasma hominis, and Lactobacillus spp. for diagnosis of bacterial vaginosis in human immunodeficiency virus-infected women," *J. Clin. Microbiol.*, 43(9), 4607–4612, 2005. Doi: 10.1128/JCM.43.9.4607-4612.2005

[15] Anukam, K., Idemoh, C., Olise, N. "Evaluation of bacterial baginosis (BV) using nugent scoring system," *J. Med. Biomed. Res.*, 13(1), 25–32, 2014. Doi: 10.4314/jmbr.v13i1.

[16] Özeren, M., Ulusoy, M., Tosun, İ., Üçüncü, A. Ekmen, Ü., and Aydemir, V. "Trabzon Yöresinde Vajinal Akıntı Yakınması Olan Kadınlarda Bakteriyel Vajinozis Görülme Sıklığı," *Kadın Doğum Derg.*, 12,(2), 95–97, 1996.

[17] Şahin,N.N."Bakteriyel Vajinoz: Yaygınlığı, Tanısı ve İnfeksiyonu Etkileyen Faktörler," *Flora*, 5(1), 67–73, 2000.

[18] Morris, M., Nicoll, A., Simms, I., Wilson, J., Catchpole, M, "Bacterial vaginosis: a public health review," *BJOG*, 108(5), 439–450, 2001. Doi: 10.1111/J.1471-0528.2001.00124.X

[19] Nwankwo, T. O., Aniebue, U.U., Umeh, U. A. "Syndromic Diagnosis in Evaluation of Women with Symptoms of Vaginitis," *Curr. Infect. Dis. Rep.*, 19(1), 3, 2017. Doi: 10.1007/S11908-017-0558-9

[20] Albayrak, H. T., Albayrak, A. M., A. Bakır, Şahin, İ. "Vulvovajinal Enfeksiyon Tanı Yöntemlerinin Karşılaştırılması ve Predispozan Faktörlerin Etkilerinin İncelenmesi," *J DU Health Sci Inst*, 10(1), 52–57, 2020. Doi: 10.33631/duzcesbed.558836

[21] Kalkancı, A., Çiftçi, B., Biri, A., Kuştimur, S., Güner, H. "Distribution Of The Pathogens According To Vaginal Culture Results Of The Patients With Vaginitis," *J. Clin. Obstet. Gynecol.*, 15(3), 137–139, 2005.

[22] Tünger, Ö., Özbakkaloğlu B., Ecemiş, T., Koyuncu, F. "Vulvovajinitli Kadınlarda Maya Mantarlarının Sıklığı ve Türlere Göre Dağılımı," *Türk Mikrobiyoloji Cemiy. Derg.*, 30(3), 127–130, 2000.

[23] Altinbaş, R., Vajinal Enfeksiyonlara Yaklaşım, in: Temel Kadın Hastalıkları ve Doğum Bilgisi, (Eds. İ. V. Fenkçi and Ü. Çabuş), Akademisyen Kitabevi A.Ş, Ankara, pp. 641–648, 2019.

[24] Wiese, W., Patel, S.C., Ohl, C.A., Estrada, C.A. "A meta-analysis of the Papanicolaou smear and wet mount for the diagnosis of vaginal trichomoniasis," *Am. J. Med.*, 108(4), 301–308, 2000. Doi: 10.1016/S0002-9343(99)00466-0

[25] Aycan Kaya, Ö., Benk Şilfeler, D., Özgür, T., Keskin Kurt, R., Hamamcı, B., Sefil, N., et al. "Bir Üniversite Hastanesi Jinekoloji Polikliniğine Başvuran Kadınlarda Parazitolojik ve Sitolojik Yöntemlerle Trichomonas Vaginalis Araştırılması," *Konuralp Tıp Derg.*, 7(3), 146–148, 2015. Doi: 10.18521/KTD.32329

[26] Çulha, G., Hakverdi, A. U., Zeteroğlu, Ş., Duran, N. "Vaginal Akıntı ve Kaşıntı Şikâyeti Olan Kadınlarda Trichomonas vaginalis Yaygınlığının Araştırılması," *Acta Parasitologica Turcica*, 30(1), 16–18, 2006.

[27] Akarsu, G.A., Çelik, T., Güngör, Ç., Altıntaş, K. "Ankara'da çalışan genelev kadınlarında Trichomonas vaginalis sıklığı," *Türkiye Parazitoloji Derg.*, 27(4), 252–254, 2003.

[28] Tao, Z., Zhang, L., LV, T., Chen, R., Wang, L., et al., "The Pathogenesis Of Streptococcus anginosus In Aerobic Vaginitis," *Infect. Drug Resist.*, 12, 3745–3754, 2019. Doi: 10.2147/IDR.S227883

[29] Temelli Akın, F., Midi, A., Çelik, A. Haliloğlu, B., İlter, E., Eren, A. "Ria Kullanımının Genital Flora Üzerine Etkisi, Kültür Sonuçlarının Smear Sonuçları ile Karşılaştırılması," *Maltepe Tıp Derg.*, 1(1), 21–27, 2009.

[30] McIver, C.J., Rismanto, N., Smith, C., Naing, Z.W., Rayner, B., Lusk, .M.J., *et al.* "Multiplex PCR testing detection of higher-than-expected rates of cervical mycoplasma, ureaplasma, and trichomonas and viral agent infections in sexually active Australian women," *J. Clin. Microbiol.*, 47(5), 1358–1363, 2009. Doi: 10.1128/JCM.01873-08

[31] Sönmez, C. “Genital Mikoplazma" sıklığının multipleks gerçek zamanlı polimeraz zincir reaksiyonu ile saptanması: Klinikte önemli olabilir mi?,” *Turk Hij Den Biyol Derg*, 75(4), 375–382, 2018. Doi: 10.5505/TurkHijyen.2018.79926

International Journal of Health Services Research and Policy
www.dergipark.org.tr/ijhsrp
IJHSRP
e-ISSN: 2602-3482

Research Article

CONTINUOUS PROFESSIONAL DEVELOPMENT (CPD) OF DOCTORS IN SRI LANKA: A QUALITATIVE STUDY

Ranga SABHAPATHIGE*[1] ***Dilrukshi DEERASINGHE[2]***
Gamage Samantha RANASINGHE[3]

[1]Visiting Research Fellow, University of Kent, Canterbury, United Kingdom
[2] Visiting Research Fellow, University of Kent, Canterbury, United Kingdom
[3]Honarary Research fellow, University of Aberdeen, Aberdeen, United Kingdom
* Corresponding author; rangasabhapathige@gmail.com

Abstract: *Continuous professional development is the method by which doctors maintain their knowledge, abilities, and attitudes up to date to meet the demands of their patients, the health service, and their career growth. The goal of this study is to evaluate Sri Lanka's present continuous professional development program for medical officers. This qualitative study was conducted from January 2020 to August 2020 at the Ministry of Health, Sri Lanka. Data was gathered through in-depth interviews, as well as two focus group discussions and a review of the literature. In 2010, the Sri Lanka Medical Association launched a new initiative with the assistance of the Sri Lanka Medical Council, the Ministry of Health, and the professional colleges, which was partially successful. However, this program could not be sustained for an extended period. At the movement, there is no well-organized continuous professional development program for Sri Lankan doctors. Continuous professional development activities are not required for doctors in Sri Lanka to practice or renew their registration. In the absence of a well-organized and streamlined program for medical officers, medical officers' lack of interest in participating in programs, the fact that programs do not reach out to remote areas of the country, and a lack of financial incentives for continuous professional development activities have all been identified as major reasons for non-engagement in activities. Based on the findings of this study, it is suggested that the ministry establish a central body to organize, streamline, and coordinate programs, that an annual calendar should be prepared and published on the ministry website, that a mechanism is developed to link continuous professional development activities to the renewal of the Sri Lanka Medical Council registration, and that a web-based mechanism to be established to bring medical officers working in rural hospitals for programs.*

Keywords*: Continuous professional development, career pathway doctors, Sri Lanka, and revalidation*

Received: November 3, 2021 *Accepted: March 7, 2022*

1. Introduction

Continuous professional development is defined as any learning received outside of undergraduate or postgraduate education that aids in the maintenance and improvement of performance. Both formal and informal learning activities are included. CPD strives to improve and sustain the quality of patient care as well as the standards of health care services and teams. CPD keeps doctors up to date and competent in their field of practice. CPD assists doctors in identifying areas where they excel, addressing areas where they need to improve, and learning new skills, information, and habits [1].

CPD is the method by which doctors keep their knowledge, abilities, and attitudes up to date in order to fulfill the demands of patients, the health service, and their own professional growth. The terms CME (Continuous Medical Education) and CPD (Continuous Professional Development) are frequently used interchangeably. Since the previous decade, CME has expanded to incorporate social, management, and personal skills in addition to typical clinical medicine topics [2]. CPD encompasses not only the skills needed to practice high-quality medicine, but also the multidisciplinary context of patient care, ethical practice, communication, professionalism, management, team building, information technology, audit, and attitude change in order to improve patient services and outcomes and achieve the highest levels of stakeholder satisfaction. CME and CPD are learning procedures that last a lifetime [3].

The CME is also defined as the body of knowledge and skills generally recognized and accepted by the profession within the basic medical sciences, clinical medicine, and the provision of health care to the public [4]. Some countries use a credit-based system to quantify CME activities. One hour of CME activity is equivalent to one credit. The doctor should obtain 50-100 credits per year. CME activities are not compulsory in most countries, but doctors engage them actively and voluntarily as professional self-regulation. CME is a mandatory requirement for doctors in countries like the Netherlands, Canada, the United States, Australia, and New Zealand, where revalidation and recertification of doctors is a compulsory requirements [2].

However, hour-based credit systems for recertification have not been successful in most Southeast Asian countries due to a lack of motivation, absence of need-based accredited CME/CPD programs, incentives, and legal bindings [3]. CME became compulsory in Singapore in 2003 [5].

Only a handful of doctors are currently engaged in CPD activities in Sri Lanka. Although there have been a few attempts to implement CPD, it has been unsuccessful due to failures in the system [6]. Since there was no CPD framework, continuous medical education, or continuous professional development programs, doctors didn't need to participate in the CPD program in Sri Lanka [7]. Therefore, assessing the currently available CPD program for doctors in Sri Lanka is very important to design and implement the CPD program and revalidation system in the future. This study aims to assess the current continuing professional development program for medical officers in Sri Lanka.

2. Methods

Our research team consisted of three MD (Doctor of Medicine) researchers (two males and one female) and one of them with formal training and experience in qualitative methods, one with formal training in statistics, and the other with experience in health care management and health system research, but no formal training, in qualitative methods or statistics.

This qualitative study was conducted from January 2020 to August 2020 at the ministry of health, Sri Lanka. In-depth interviews and focus group discussions (FGD) were used as study instruments. In addition, conducted a review of the literature to gather more information to complete the data collected in the interviews and focus group discussions.

Face-to-face in-depth semi-structured interviews with the four relevant higher officials of the ministry of health and four doctors were conducted by the principal investigator (R.S) using the validated interview guide. A purposive sampling technique was used for sampling. Interviews were conducted in a respective office room and lasted approximately 20 minutes each. Answers were recorded by the audio recorder and -re-interviewing also was conducted to complete the data.

Focus group discussions were conducted by other two researchers (D.D and S.R), with 12 medical officers and 10 medical administration (health care management) postgraduate trainees respectively. Study participants with a minimum of one year of work experience at the ministry of health in Sri Lanka were selected by using the criterion sampling technique.

The key informant's interview guides, formats for FGDs were predesigned, pretested, and validated. Data were collected until no new data was generated by the participants. Anyone else was not present besides the study participants during data collection times. All responses of key informants and participants in focus group discussions were transcribed using the verbatim transcription. Transcriptions were returned to the participants for comment and correction. The data was then initially coded, with descriptive categories, subcategories, main categories, and themes created. Finally, a narrative summary of the main findings was prepared.

The time for data collection was discussed with relevant ministry officials and the medical officers and postgraduate trainees. Every possible measure has been taken to prevent the disruption of routine work departments and participants. All participants were given a brief introduction before the study. The participants were provided enough time to answer the questions and they were provided the contact details of the investigators and asked to contact them for any clarifications and investigators had built a good relationship with the participants. Administrative clearance for the study was obtained from relevant authorities. The anonymity of the participants was preserved.

3. Results and discussion

3.1. In Sri Lanka, the CPD program for doctors is evolving.

The Sri Lanka Medical Council (SLMC) introduced a revalidation program for doctors registered under the SLMC in 2000. Although some necessary initiatives were brought to introduce CPD program for doctors in the whole country, it was not very popular among medical officers and couldn't persist for long due to inadequate support from the ministry of health (MoH), professional colleges, and doctors.

In 2010, the Sri Lanka Medical Association (SLMA), with the help of SLMC, the MoH, and several professional colleges, started a new CPD program, and it was successful to a certain extent. SLMA introduced two routes for CPD activities. The route for a specialist was planned to be conducted via professional colleges, while the route for medical officers was through district CPD committees. The professional colleges have been given the responsibility of organizing and conducting CPD activities for specialists. SLMA published the way of doing CPD activities and the way of obtaining CPD points. Those who completed required CPD activities were awarded the national CPD certificate. However, this CPD program was also not sustained for a considerable period, and there is no well-organized CPD program for doctors in Sri Lanka at the moment.

3.2. Sri Lanka's Ministry of Health has an education and training unit.

The education and training unit (ETR) is the responsible department for the CPD of doctors and other health care workers under the ministry of health, Sri Lanka. The ETR unit arranged and conducted various in-service training programs to build the capacity of the doctors. Usually, the annual requirement for in-service training is identified by health care institutions after conducting a gap analysis. Healthcare institutions send their training requirements with the budget to the ETR unit. After considering the priority and technical feasibility of the proposals, the ETR unit approves the training program and budget to conduct the training. The ETR unit had allocated Rs. 6,807,856 (33536 USD) for the in-service training program of doctors during the year 2018 and which was highly insufficient. Further, the doctors can request funds from ETR for their training courses conducted by government institutions. The course fees of prior approved training courses are reimbursed by the ETR unit, MOH.

3.3. Other institutions under the ministry of health in Sri Lanka

There are several other departments of the ministry of health that also carry out continuous professional development programs for doctors. The National Institute of Health Sciences conducts

public health training, research methodology, and GPS technology training for doctors engaged in preventive health in Sri Lanka. The Family Health Bureau (FHB), Epidemiology Unit, and Health Promotion Bureau conduct training on maternal and child health, communicable diseases, and health promotional program respectively for doctors' offices island-wide.

3.4. Induction training of doctors under the Ministry of Health

Before starting the post-intern appointments and after transfers, doctors selected for specialties like anesthesia, intensive care, transfusion medicine, psychiatry, and neonatology need induction training under respective specialists. The training period may vary from one month to six months, depending on the specialty. Also, before starting the internship, the government medical officers' association with the collaboration of the ministry of health and the University of Colombo conducts a good intern program for doctors. It was designed to improve the clinical skills of pre-intern doctors, reduce medical errors, and improve communication.

3.5. Professional associations and colleges

The SLMA, professional colleges, regional medical associations, and clinical societies conducted CPD activities like academic sessions of professional colleges or associations, regional meetings, local meetings, case conferences, non-routine teaching, journal club activities, skills training workshops, research, and publications for doctors in various places. The SLMA initiated the awarding of the national continuing professional development certificate (NCPDC) to doctors who had completed the above activities to ensure the highest professional standards among doctors.

Identified deficiencies and suggestions for improvements through the in-depth interviews and FDGs for CPD of doctors are given in the following themes.

3.6. Participation in CPD is not a mandatory regulation in Sri Lanka.

The vast majority mentioned CPD is not a mandatory requirement according to the current law of Sri Lanka, and CPD activities are not a required criterion for renewal of the registration. Therefore, it becomes a low priority among doctors' schedules. Renewal of the SLMC registration of doctors is done without an examination or completion of CME/CPD points once every five years. The most common challenge for CPD for doctors in Sri Lanka is the lack of legal requirements for CPD, as highlighted by a director of the ministry of health, Sri Lanka:

"Like most of the regional countries, CPD for doctors in Sri Lanka is not a mandatory requirement for the renewal of registration by SLMC. CPD is also not necessary for annual salary increments or grade promotions of doctors. Therefore, no one cares about CPD except extremely self-motivated doctors''.

The previous study conducted in Sri Lanka also identified the main reason behind non-engagement in CPD [6]. The provision of CME is not legally considered a "service of general interest" in Europe [8]. However, in the Netherlands, the recertification system is made compulsory by law, and CPD activities are made compulsory for most specialties. Australia and New Zealand encourage self-learning of CME/CPD but include mandatory components for all [2]. However, once the doctor is qualified and registered, he is licensed to practice medicine for a lifetime without proper revalidation in most Southeast Asian countries [9].

3.7. Lack of a properly organized CPD system within the ministry of health, Sri Lanka

"Many participants pointed out that currently, the CPD system is not being well established and organized within the ministry of health, and CPD activities take place in an ad hoc manner. The hospital

administrators or the MoH have not taken the trouble to have an annual calendar for CPD activities. Therefore, doctors could not decide and make duty arrangements enabling them to take part in CPD activities relevant to their fields. Further, there is no point system for CPD activities in the ministry of health, Sri Lanka. In the focus group discussion with doctors, they pointed the finger toward the ministry of health for not having a proper CPD framework in Sri Lanka as:

"It is a responsibility of the ministry of health to develop a proper CPD framework for the country, including a training priority, an annual training calendar, duty leave arrangements for participants, a point system, and incentives for those who complete the required number of points."

Similarly, a few other studies found that Sri Lanka lacks the infrastructure and mechanisms to provide appraisal and CPD points for doctors [10], and a feasible platform for CPD activities for doctors at the institutional, provincial, and national levels is required [11].

3.8. Lack of incentives and career pathways for doctors engaged in CPD activities.

As per many participants, since there are no financial incentives like allowances or salary increments for doctors who participate in CPD program in Sri Lanka, they are reluctant to engage in programs. During the focus group, discussion with doctors engaged in medical administration described the problem as:

"*CPD activities are not recognized in the current salary increment system operating in the ministry of health or in grade promotion of doctors under the ministry of health. The doctors are recruited to the ministry of health as preliminary grade medical officers, and they are promoted to grade two after completing the efficiency bar examination of the ministry of health. The Efficiency Bar examination assesses government procedures, discipline, hospital management, and financial regulation. It doesn't assess the clinical competencies of doctors. "*

"Doctors are promoted to grade one after completing a post-graduate diploma or MSc in 6 years or without any qualification in 10 years. Although this grading system has been established in the ministry of health in Sri Lanka, it doesn't link with any career pathway within the health care system of the country. Therefore, CPD activities don't help doctors to advance their position in their career pathways."

The doctors who completed the required CPD activities had been offered incentives in Belgium, Norway, and the United Kingdom [2]. General practitioner trainers in the United Kingdom were paid 500 GBP in the 2019 financial year [12].

3.9. Low interest of medical officers in participating in CPD programs

According to the views of some doctors in focus group discussion, doctors are not interested in participating in CPD program due to two main reasons.

"Since government sector doctors in Sri Lanka are allowed to do private practice after their working hours, they don't have time to engage in CPD activities after working hours."

"Further, according to the current extra duty payment system of MoH, we couldn't claim extra duty payments for the days that we engage in CPD activities. Hence, most of us are not willing to participate in CPD activities".

A study conducted in Pakistan also revealed lack of study leave (time) busy clinical schedules, cost, and work-life imbalance as the most common perceived barriers to practicing CPD [13].

3.10. Doctors in rural hospitals are unable to attend CPD program.

During the individual interviews and FGDs, many participants highlighted Most of the CPD programs are being conducted in cities where teaching hospitals and other large hospitals have the necessary resources and resource people are available. The doctors who are working in peripheral

hospitals do not get a chance to take part in those activities unless they come to the relevant centers. The lack of online or web-based CPD programs for doctors working in remote areas was also mentioned as a barrier to the participation of remote working doctors. One of the doctors working in the remote hospital described their difficulty in attending CPD activities as:

Since I have been working in a rural hospital 350 km away from Colombo for 3 years, it is very difficult for me to attend physically to CPD activities. Only two doctors are working in my divisional hospital. If one takes a leave, the other one must work continuously for 48 hours. Then that doctor must see OPD patients, emergencies as well as ward patients. Sometimes, he must conduct NCD clinics or antenatal clinics. Therefore, how can we attend the CPD program conducted in Colombo? "

A study conducted in Sri Lanka suggested that eLearning using web-based distance education would expand the opportunities for doctors working in rural distal areas of Sri Lanka by providing a flexible, convenient, and interactive form of CPD [14]. Furthermore, a review conducted to evaluate the outcomes of web-based continuing medical education in Europe revealed that web-based education provides numerous advantages to general practitioners (GPs), particularly those in rural and remote locations, including convenience, ready availability, reduced travel costs, and flexibility [15].

3.11. Study limitations

This study includes the views of health ministry officials' doctors and doctors engaged in health care management. This study doesn't contain the views of professional colleges, the Sri Lanka Medical Council, or the Sri Lanka Medical Association. However, the data obtained from the focus groups consist of rich information and diverse perceptions were acquired.

4. Conclusions and recommendations

The study highlighted the importance of CPD activities as a means of empowering doctors to demonstrate their competency and professionalism to patients. Although several activities related to the CPD of doctors are arranged by the ETR unit and other units of the ministry of health, the well-organized CPD structure which links to the revalidation of SLMC and performance appraisal is not established in Sri Lanka now. Based on the findings of this study, the majority suggested establishing a central body in the MoH Sri Lanka to organize, streamline, and coordinate the CPD program for doctors. It was suggested that representatives of this central body should be selected from relevant stakeholders like MoH, SLMC, professional colleges, university academics, and trade union representatives. An annual CME program calendar should be prepared, and it should be published on the internet and the website of the MoH. The program should be communicated to doctors by letters, emails, or messages. Those organized by the professional colleges should be published on the websites of the colleges.

It was suggested by many participants that the SLMC and the MoH get together with relevant stakeholders to work out a mechanism to link CPD activities to the renewal of the SLMC registration. Each MO should be advised to keep a CPD record with them, and one hour's CPD activity should be regarded as one CPD point. Since the SLMC registration is renewed once every five years, it is appropriate to have CPD cycles of five years. The number of CPD/CME points required for renewal of registration should be decided after adequate consultations with relevant stakeholders. Many of them emphasize the importance of providing financial incentives like a bonus or a salary increment to MOs who complete the prescribed number of CPD/CME units, and the system adopted by private sector hospitals could be taken as a benchmark practice for this. Furthermore, the use of information and communication technology (ICT) to popularize web-based CPD/CME activities. Many suggested facilitating MOs working in remote areas with limited resources using these types of digital web-based distance learning programs and evaluation after the course. The study emphasized the importance of having their own pre-prepared annual CME/CPD activity calendar and communicating this calendar

among relevant doctors. According to the study findings, many participants believed adopting the above suggestions would help to establish proper career pathways and interim carder links to CPD activities for doctors in Sri Lanka in the future.

Ethical statement

Administrative clearance for the study was obtained from the deputy director-general, medical services, Ministry of Health, Sri Lanka. Prior to the interviews, all participants provided verbal informed consent. This project was conducted as a part of CME development program. Hence, ethical approval was not required because study participants were chosen based on their professional roles.

Acknowledgment

The authors would like to thank the deputy director-general of medical services at the Ministry of Health in Sri Lanka for his assistance in conducting the research. The authors would also like to thank the officials from the Ministry of Health, postgraduate trainees in health care management, and doctors who took part and shared their perspectives.

Conflict of interest:

All three authors declared that they had no conflict of interest in this study.

Authors' Contributions:

This study's conception and implementation were aided by all three researchers. The first author was in charge of overseeing the entire study and coordinating the operations. The first author conducted the in-depth interviews, while the second and third authors participated in focus groups and literature reviews, respectively. The final manuscript was read and approved by all writers.

References

[1] GMC.(2012). *Continuing professional development – GMC* [Online] . Available: https://www.gmc-uk.org/education/standards-guidance-and-curricula/guidance/continuing-professional-development.

[2] C. Peck, M. Mccall, B. Mclaren, and T. Rotem, "Education and debate Continuing medical education and continuing professional development: international comparisons Methods Common features of systems for professional development internationally Continuing professional development and recertification in Europe," 2000. [Online]. Available: www.bmj.com.

[3] WHO, Regional Guidelines for Continuing Medical Education (CME)/ Continuing Professional Development (CPD) Activities, SEA-HSD-334, WHO regional office for South East Asia, New Delhi, India, 2010.

[4] ACCME. (2020). CME Content: Definition and Examples | ACCME [Online]. Available: https://accme.org/accreditation-rules/policies/cme-content-definition-and-examples .

[5] SMC. (2003). SMC | Continuing Medical Education (CME) for Doctors [Online] . Available: https://www.healthprofessionals.gov.sg/smc/continuing-medical-education-(cme)-for-doctors.

[6] Y. J. Samarasinghe, W. K. W. S. Kumarawansa, A. J. Abhayaratne, I. W. M. J. Wickramaratne, and P. H. Wijenayake, "A SWOT analysis of implementation of continuous professional development for medical doctors in Sri Lanka," *South-East Asian J. Med. Educ.*, 14(1), 16-26, 2020. doi: 10.4038/seajme.v14i1.174.

[7] G. S. . Ranasinghe and P. W. . Panapitiya, "A study of current Continuous Medical Education / Continuous Professional Development programmes for health care staff with special focus on

Medical officers and recommendation for improvement," *Int. J. Sci. Res. Publ.*, 10(8), 525–527, 2020. doi: 10.29322/ijsrp.10.08.2020.p10466.

[8] R. Griebenow *et al.*, "Roles and Responsibilities in the Provision of Accredited Continuing Medical Education/Continuing Professional Development," *J. Eur. C.*, 6(1), p. 1314416, 2017. doi: 10.1080/21614083.2017.1314416.

[9] J. Ygsw and C. Author, "Are South East Asian Countries Ready for Revalidation Process of Physicians Through Mandatory Continuing Professional Development (CPD) Activities?," *South East Asian J. Med. Educ.*, 10(1), 1-8, 2016, doi: 10.3402/jecme.v4.27411.

[10] Epa S.S, *National CPD certificate, Information and guidebook*. Sri Lanka Medical Association, Colombo, 2010.

[11] I. Karunathilake, W. Jayarathne, K. Marambe, and J. Ygsw, "CPD provision Framework for Sri Lankan Grade Medical officers Development of Continuing Professional Development (CPD) Provision Framework for Sri Lankan Grade Medical Officers," *South East Asian J. of Med. Educ.*, 10(1), 27-36, 2016 . Available: https://www.researchgate.net/publication/325176369.

[12] Health education England.(2021) . Continuing Professional Development [Online] . Available: https://www.westmidlandsdeanery.nhs.uk/postgraduate-schools/public-health/ph-practitioners/continuing-professional-development.

[13] N. Shah, M. Soomro, M. Musharraf, and S. Shaikh, "Mixed method survey to assess the problems and propose solutions for the implementation of CME/CPD in Sindh, Pakistan," *Pakistan J. Med. Sci.*, 35(2), 555-560, 2019. doi: 10.12669/PJMS.35.2.243.

[14] M. R. K. I. Kulatunga Gumindu, "Introduction of Web-based Continuous Professional Development to Sri Lanka," *Sri lanka J. Biomed. informatics*, 3(4), 127–131, 2012. doi: 10.4038/sljbmi.v3i1.4798.

[15] Curran VR and Fleet L, "Review of evaluation outcome of web-based continuing medical education," *Med. Educ.*, 37(6), 561–567, 2005.

International Journal of Health Services Research and Policy
www.dergipark.org.tr/ijhsrp

IJHSRP

e-ISSN: 2602-3482

Research Article

EVALUATION OF THE RELATIONSHIP BETWEEN NURSING STUDENTS' DYSFUNCTIONAL ATTITUDES AND THEIR ACCEPTANCE OF AESTHETIC SURGERY

Özge İŞERİ [1] ***Belgin ŞEN ATASAYAR*** [1]

[1]Ondokuz Mayıs University, Faculty of Health Sciences, Nursing Department, Samsun, Turkey
Corresponding author: ozgepekiniseri@gmail.com

Abstract: *The purpose of this study was to analyze the relationship between nursing students' dysfunctional attitudes and their acceptance of aesthetic surgery. The study was performed as a descriptive study with 105 second-year nursing students at a health sciences faculty located in the central Black Sea Region of Turkey from 1 November- to 30 December 2021. The Descriptive Characteristics Form, the Acceptance of Cosmetic Surgery, and the short-form Dysfunctional Attitudes Scale were used for the collection of the data. Data were analyzed by using the SPSS Statistics 23.0. Descriptive statistics (frequency, percentage, mean, and standard deviation), Mann-Whitney U, Kolmogorov-Smirnov, Kruskal-Wallis, and Pearson's correlation tests were used. It was found that the mean scores obtained from the Acceptance of Cosmetic Surgery Scale and the short-form Dysfunctional Attitudes Scale were respectively 52.44±20.97 and 87.64±17.97 points. Moreover, it was ascertained that there was a statistically significant weak negative correlation between the students' dysfunctional attitudes and whether they accepted the aesthetic surgery (r= -0.281, p< 0.01). The nursing students have dysfunctional attitudes and acceptance of aesthetic surgery was above the medium level. Increasing dysfunctional attitude negatively affects the acceptance of aesthetic surgery. In light of this result, it is considered that, for raising awareness about the students' dysfunctional attitudes and improving them, it is important to support the students and it is necessary to inform them about aesthetic surgery. Nurse educators should provide students with additional education to identify dysfunctional attitudes. For this reason, it is recommended to include course contents that provide information about aesthetic surgery and dysfunctional attitudes in the nursing curriculum.*

Keywords: *Aesthetic Surgery, Dysfunctional Attitude, Nursing Student*

Received: December 1, 2021 Accepted: March 01, 2022

1. Introduction

The word 'aesthetics' originated from 'aisthanomai' and means 'to perceive'. Perceiving is a mental process [1]. While the viewed images are perceived in this mental process, whether they look aesthetic or beautiful is also determined. Thus, it can be said that aesthetics is the science of senses [2]. The beauty and aesthetic perceptions toward the body change in each period. It is asserted that a perfect physical appearance is necessary for a good career, family, social status, and high self-esteem [3]. Therefore, even if the individuals have no physiological and functional problems, they can choose to have aesthetic surgery to get the approval, affection, or appreciation from other people in society. That is, the people's beauty and aesthetic perceptions are affected by the society in which they live [4]. Adolescence, in particular, is the development period when these criteria which are acknowledged by society are largely embraced. In this period, the adolescent grows up fast, he/she feels the need to

socialize more and experiences quick emotional fluctuations. Besides, the adolescents become open to having new experiences and attach importance to being acknowledged and being in companionship in the group in which they are placed. Thus, the acknowledged societal beauty patterns affect individuals in the adolescence period more [5]. Negative attitudes that adolescents develop toward their bodies are related to their own thoughts and emotions as in the case of all other individuals. These attitudes are mostly strict and permanent. Thus, changing these attitudes along with the experiences to be acquired by the person is quite challenging, and these attitudes induce the individuals to focus on irrational thoughts [6]. For this reason, the individuals evaluate themselves and their bodies negatively in this process and choose to have aesthetic surgery [7]. As is discerned, aesthetic surgery undergoes a process that is different from those of other surgical initiatives because the process of surgical operation is frequently initiated not by the surgeon but by the patient in aesthetic surgery. Thus the psychiatric preparedness of the patient who has aesthetic surgery should be addressed in more detail and more comprehensively [8]. The surgical nurse who has important roles and responsibilities across the entire process before, during, and after the surgical operation is a key person at this point. Knowing the attitudes of nursing students who are in the late period of adolescence and exhibit the characteristics of adulthood is of importance because these attitudes are likely to affect the quality of healthcare that they will provide in the future. Dysfunctional attitudes acquired during this period may also negatively affect patient-nurse interactions, causing false messages, stigma, and therefore unhealthy nursing care. Also as per the review of the relevant literature, good quality nursing care is essential to overcoming physical problems besides the negative feelings about the appearance of the body and to ensuring the patient's adaptation to the new lifestyle and body image [8-10]. That is why, the nurses and nursing students should assess under which circumstances the patients need support and must plan the nursing care in light of the individuals' personalities, qualifications, interests, roles, and functional and dysfunctional expectations and attitudes [10]. Upon the review of the relevant literature, it was found that there were a limited number of studies performed on the acceptance of aesthetic surgery by the students [11,12], and the focus was placed more on the breast reconstructıon [13,14] but dysfunctional attitudes were not examined. In this direction, this study aims to analyze the relationship between nursing students' dysfunctional attitudes and their acceptance of aesthetic surgery.

2. Materials and Methods

2.1. Type of research

This research is performed in the type of descriptive and correlational principles.

2.2. Participants and setting

This study was performed with the participation of second-year nursing students who were enrolled in the nursing department of a university located in the central Black Sea Region of Turkey. The first-year students were excluded because they had taken courses related to aesthetic surgery, and the first-year students did not yet have knowledge about the surgical process and care. Therefore, only nursing second-year students were included in the study. No sampling method was used to determine the research sample. The research population was comprised of 137 second-year students. The sample was not specifically selected in the study, and accordingly, it was performed with 105 students (76.64%) who agreed to participate in the research and made contact via Google Forms. The nursing students who did not want to partake in the research (n=18), made errors while filling in the data collection forms (n=5), or provided answers with missing information (n=9) were excluded from the study.

2.3. Data Collection Tools

2.3.1 Descriptive Characteristics Form

The form created by the researchers in light of the relevant literature is composed of five questions that identify the participant nursing students' sociodemographic characteristics and seven questions that address their thoughts about aesthetic surgery [1-14].

2.3.2 Acceptance of Cosmetic Surgery Scale (ACSS)

The scale was developed by Henderson-King (2005) [15]. It was adapted to Turkish by Karaca et al. (2017) [16]. As a seven-point Likert-type scale, ACSS can be evaluated as per the scores obtained from both its three subscales and the overall scale. It has three subscales, that is, *Intrapersonal* (Items 1, 2, 4, 5, and 14), *Social* (Items 9, 11, 12, 13, and 15), and *Consider* (Items 3, 6, 7, 8, and 10). *The intrapersonal* subscale addresses the individual's personal evaluations which are made on his/her appearance and aimed at motivating him/her to undergo cosmetic surgery. *The social* subscale covers the affirmative attitudes toward aesthetic surgery which make the individuals feel better in their social relations and social settings. *Consider* subscale evaluates the individuals' views about aesthetic surgery. The total score to be obtained from the scale ranges between 15 and 105 points. High scores to be obtained from the overall scale and its sub-scales show that the attitudes toward aesthetic surgery were positive and the aesthetic surgery was accepted. Cronbach's Alpha coefficient was calculated for the scale as 0.92 in the study by Henderson-King and 0.90 in the study by Karaca et al [15, 16]. In this study, Cronbach's Alpha coefficient was calculated as 0.90.

2.3.3 Short-Form Dysfunctional Attitudes Scale (DAS-A-17)

The original version of the scale was developed by Weissman and Beck (1978) for putting forth the frequency of dysfunctional attitudes toward depression. Designed as a seven-point Likert-type scale, the original version was comprised of 40 items, and organized in two forms, A and B. Graaf, Roelofs, and Huibers (2009) selected 17 items from Form A, and hence created the short-form of the scale. This short form of the scale was adapted to Turkish by Şahin and Batıgün (2016). A high score to be obtained from the scale demonstrates that the individual frequently has dysfunctional attitudes. DAS-A-17 has two subscales, *Perfectionism* (Items 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, and 12) and *Dependency* (Items 10, 13, 14, 15, 16, and 17). Cronbach's Alpha coefficient was calculated as 0.81 for the overall scale, 0.77 for the *Perfectionism* subscale, and 0.74 for the *Dependency* subscale [17]. Cronbach's Alpha coefficient was calculated as 0.77 in this study.

2.4. Data Collection

Data were collected from 1 November-30 December 2021. Information on the purpose and the application of the research was given to the second-year nursing students. Nursing students were informed that their participation in the research was voluntary and they were free to withdraw from the research at any time they desired. The survey was applied to the nursing students through Google Forms. Filling in each form took 10 minutes on average.

2.5. Statistical Analysis

Research data were evaluated with SPSS (Statistical Package for Social Science) 23.0. Whether the research data were normally distributed was tested via the Kolmogorov-Smirnov test. For data with non-normal distribution, the Mann-Whitney U test was used in making comparisons between two groups whilst the Kruskal-Wallis test was utilized in comparing three or more groups. Moreover, in the study, descriptive statistics (number, percentage, mean, standard deviation) were used, and the Pearson

Correlation test was employed for analyzing the correlation between two variables. Statistical significance was identified if the P-value was lower than 0.05 ($p<0.05$).

3. Results

It was ascertained that the mean age of the nursing students who were included in the research was 20.36±1.24 years, 76.2% of the participant nursing students were female and 67.6% of them perceived their economic well-being as good. Of all the participant nursing students, 94.3% reported that they had no aesthetic surgery, 69.5% said that they had no relative who had aesthetic surgery, 37.1% told that there was a body part disliked by them, 40% stated that their religious beliefs affected their views about the individuals who had aesthetic surgery, 77.1 % declared that they had adequate self-esteem and 90.5% of them declared that they have a religious value (Table 1).

Table 1. Participant nursing students' descriptive characteristics (n = 105)

Variable	**$\bar{X}$± SD**	**Min. -Max.**
Age (year)	20.362±1.241	18-25
	n	**%**
Gender		
Female	80	76.2
Male	25	32.8
Perception of economic well-being		
Good	71	67.6
Bad	34	32.4
Having aesthetic surgery in the past		
Yes	6	5.7
No	99	94.3
Having any relative who had aesthetic surgery		
Yes	32	30.5
No	73	69.5
Having any disliked body part		
Yes	39	37.1
No	66	62.9
Religious belief effect on aesthetic surgery		
Yes	42	40.0
No	63	60.0
The feeling of having adequate self-esteem		
Yes	81	77.1
No	1	1.0
Partially	23	21.9
Religious Value		
Yes	95	90.5
No	10	9.5

In a comparative context, Table 2 displays the participant nursing students' descriptive characteristics and the means of their ACSS and DAS-A-17 scores. On the basis of 'perception of economic well-being', 'having any disliked body part', and 'whether the religious belief has any effect on the perception toward the individuals who had aesthetic surgery, there are statistically significant differences in the means of students' ACSS scores ($p<0.05$). Moreover, on the basis of 'gender', 'perception of economic well-being, and 'feeling of having adequate self-esteem', there are statistically significant differences in the means of students' DAS-A-17 scores ($p<0.05$) (Table 2).

Table 2 Participant nursing students' descriptive characteristics and the means of their ACSS and DAS-A-17 Scores (n = 105)

Descriptive Characteristic	ACSS X̄± SD	Test / p	DAS-A-17 X̄± SD	Test /p
Age (year)	20.362±1.241 (18 min-25 max.)	r= -0.001[a] p= 0.991	20.362±1.241 (18 min.-25 max.)	r= -0.182[a] p= 0.066
Gender				
Female	51.325±2.156	Z=-1.057[b]	90.535±6.499	Z=-2.632[b]
Male	56.040±8.930	p=0.290	78.640±9.689	p=0.008**
Perception of economic well-being				
Good	50.455±21.412	Z=0.326 [b]	89.001±17.091	Z=0.366 [b]
Bad	45.401±17.500	p= 0.017*	89.851±16.831	p= 0.012*
Having aesthetic surgery in the past				
Yes	63.333±8.789	Z=-3.412[b]	88.200±8.279	Z=-1.708[b]
No	51.787±5.948	p=0.068	87.612±10.842	p=0.194
Having any relative who had aesthetic surgery				
Yes	58.420±4.443	Z=-1.208[b]	54.391±2.261	Z=-0.532[b]
No	50.621±4.375	p=0.227	50.970±2.672	p=0.594
Having any disliked body part				
Yes	63.128±8.189	Z=-4.063[b]	87.027±9.107	Z=-0.141[b]
No	46.136±10.046	p=0.000**	87.984±7.442	p=0.088
Religious belief effect on aesthetic surgery				
Yes				
No	40.610±3.981	Z=-3.304[b]	53.007±3.612	Z=-0.302[b]
	61.021±4.093	p=0.001**	51.216±3.701	p=0.763
The feeling of having adequate self-esteem				
Yes				
No	51.223±2.443	KW= 0.165[c]	87.989±4.355	KW= 6.480[c]
Partially	55.121±1.889	p= 0.921	90.001±7.653	p= 0.039*
	49.356±2.010		85.352±4.001	

[a]Correlation coefficient; [b] Mann-Whitney U Test; [c] Kruskal-Wallis Test, *p<0.05; **p<0.001

In the research, it was identified that the means of the participant nursing students' ACSS and DAS-A-17 scores were respectively 52.44±20.97 and 87.64±17.97 points (Table 3).

Table 3. Mean, median, maximum and minimum scores obtained by the participant nursing students from ACSS and DAS-A-17

	Min.-Max.	Min.-Max.	Median	$\bar{X}$± SD
ACSS	15-105	16-96	52	52.44±20.97
DAS-A-17	17-119	36-116	90	87.64±17.97

Table 4 exhibited the correlation between the means of the participant nursing students' ACSS and DAS-A-17 scores. It was discerned that there was a statistically significant weak negative correlation between the means of the students' ACSS and DAS-A-17 scores ($r= -0.281$, $p< 0.01$).

Table 4. Correlation Between The Means Of The Participant Nursing Students' ACSS and DAS-A-17 Scores

		ACSS	DAS-A-17
ACSS	r	1	-0.281
	p	-	0.005*
DAS-A-17	r	-0.281	1
	p	0.005*	-

r=Correlation coefficient; *p<0.05

4. Discussion

Nursing Students' Dysfunctional Attitudes

In this study, the effects of second-year nursing students' dysfunctional attitudes on accepting aesthetic surgery were examined. It was found that the mean of the participant nursing students' DAS-A-17 scores was 87.64±17.97 points. The minimum and maximum scores to be obtained from the scale are successively 17 and 119 points [16]. In the study by Barlas et al. (2014), it was stated that the scores to be obtained from the long-form DAS ranged from 40 to 280 points and the patients had dysfunctional attitudes above the medium level (180.97±29.62 points) [18]. It can be asserted that the nursing students who took part in this current study also had dysfunctional attitudes above the medium level. It was ascertained that there was a statistically significant relationship between the gender of the participant nursing students and the means of their DAS-A-17 scores. Female students had higher dysfunctional attitudes scores than the male students did. A high DAS-A-17 score is associated with the inclination to personally have high standards, to fear being perceived negatively by society, and to see the errors as individual inadequacy. A person's value and happiness are determined by the support, love, and affirmation to be obtained by the person from society [19]. Gender perception toward the women in society affects the woman's perception of herself and the world and tempts her to feel that she is inadequate and worthless. It is considered that the patriarchal societal structure in Turkey might affect this situation. It was discerned that there was a statistically significant relationship between the participant nursing students' perception of economic well-being and the means of their DAS-A-17 scores. It was found that the participant nursing students who perceived their economic well-being as 'bad' had a higher mean of DAS-A-17 scores than those who perceived their economic well-being as 'good' did. The socioeconomic level defined in terms of certain indicators such as a person's income, profession, and education level is a significant determinant that affects the person's clothing, environment, expectations about the future, worldview, interpersonal relations, acceptance in society, and all other circumstances in which the person is placed. This determinant can inhibit the individual's psycho-social development by affecting his/her subjective well-being, personal value perceptions, and

life satisfaction [20]. An individual who perceives his/her socioeconomic status as low in association with having a low-income level can develop dysfunctional attitudes and behaviors in an effort to gain a place in society. This finding also has parallels with the finding obtained under this current study. Self-esteem which can be characterized as the self's emotional aspect is the person's self-acknowledgment, self-appreciation, self-respect, and self-approval. Low self-esteem affects mental and interpersonal relations adversely. The human beings who are not pleased with their bodies and are suspicious of their abilities, in other words, human beings who have dysfunctional attitudes, experience feelings of inadequacy and insecurity [21, 22]. The literature supports our study findings.

Nursing Students' Acceptance of Cosmetic Surgery

The mean of participant nursing students' ACSS scores was found as 52.44±20.97 points. The minimum and maximum scores to be obtained from ACSS are 15 and 105 points consecutively. In light of this data, it is discerned that the mean scores obtained from ACSS in this current study were above the medium level. It was found that there was a statistically significant relationship between the mean of the participant nursing students' ACSS scores and the effect of religious belief on the perception of the individuals who had aesthetic surgery. It is asserted that religious beliefs are a significant factor affecting the acceptance of aesthetic surgery [7, 23]. The individuals who do not have strong religious beliefs have surgical operations more frequently. In contrast, more religious individuals can perceive aesthetic surgery as an intervention in their beliefs. Monotheistic religions uphold the view that real beauty resides in the person's spirit. Islam and Christianity do not highlight a person's physical beauty. In particular, Islam does not assent to the aesthetic interventions used for enhancing beauty by evaluating such interventions as harmful to the body [23]. The fact that most nursing students who participated in this study were Muslims is supportive of this result. In this research, 37.1% of the participant nursing students reported that they had a body part that they disliked. These students obtained higher ACSS scores than other participant nursing students did. This situation can be explained by the students' inclinations to transform the body parts which they disliked into the form which they aspired to have. Moreover, 77.1% of the participant nursing students considered that they had adequate self-esteem. These students obtained higher ACSS scores. In the study by Yılmaz Gören (2016), the individuals who had surgery for aesthetic purposes had higher self-esteem scores than those having surgical operations due to illness [10]. In the study performed by Barlas et al. (2014) for analyzing the body image of aesthetic surgery patients, their dysfunctional attitudes, and depression levels, it was found that the patients had positive body image perceptions [18]. This situation is in a similar vein to the results of this current study. Furthermore, it was discerned that there was a statistically significant relationship between the participant nursing students' perceptions of economic well-being and the means of their ACSS scores. It was identified that the students who perceived their economic well-being as 'good' had a higher mean of ACSS scores than those who perceived it as 'bad'. Considering that the social security institution of Turkey does not pay for aesthetic surgery, it is inferred that the individuals interested in having surgery need to have a sufficient level of economic well-being. This situation is in support of this current study.

5. Conclusion

It has been determined that the dysfunctional attitudes and acceptance of aesthetic surgery of the nursing students are above the middle level and that there is a negative and significant relationship between these two variables. It was found that the economic well-being perception of the participant nursing students, having body parts disliked by them, and having the effect of religious beliefs on their thoughts about the individuals who had aesthetic surgery had statistically significant relationships with the means of their ACSS scores. Besides, it was ascertained that gender, perception of economic well-being, and the feeling of having adequate self-esteem had statistically significant relationships with the

means of students' DAS-A-17 scores. In light of the obtained results, it is recommended that the students be supported for raising awareness about their dysfunctional attitudes and improving them, be informed about the societal gender patterns, improper behavior perception toward society, and the effects of religious beliefs on human life, be encouraged to be involved with the activities enhancing self-esteem, and the course contents providing information on the aesthetic surgery and dysfunctional attitudes are inserted into the nursing curriculum.

The implications of this paper:

Since nursing students are important people who will provide holistic care in the future, they should be aware of dysfunctional attitudes and understand their importance for aesthetic surgery. The need to increase students' awareness of their dysfunctional attitudes has come to the fore. For this reason, it is recommended to include course contents that provide information about aesthetic surgery and dysfunctional attitudes in the nursing curriculum.

Ethical Considerations

After receiving the permit for conducting the study from the relevant institution, the ethical endorsement was obtained from the board of ethics of Ondokuz Mayıs University which was affiliated with the relevant institution (22.10.2021, 2021/810). The research was performed in compliance with the principles of the Helsinki Declaration, and all participant nursing students consented to take part in the research verbally and in written form.

Conflict of Interest:

The authors declare no conflict of interest.

Authors' Contributions:

Designed the study; Öİ and BŞA; Collected the data; BŞA and Öİ; Analysed the data; Öİ and BŞA; Writing-Original draft preparation; Öİ and BŞA, Supervised the study; Öİ and BŞA

All authors read and approved the final manuscript.

References

[1] Ertürk, N., '' A.G. Baumgarten'da duyusal bilginin bilimi olarak estetik'', *Ulakbilge*, 4 (7), 117-128, 2016.

[2] Keskin, G., ''Aesthetics and logic in Baumgarten's Philosophy'', *Archives of Philosophy*, 49, 13-22, 2018. Doi: 10.26650/arcp2018-591061.

[3] Demirbaş, H., '' Why do people desıre aesthetıc ınterventıons? Motıvatıon behınd on'', *The Journal of Academic Social Science*, 7(99), 81-91, 2019. Doi: 10.29228/ASOS.39548.

[4] Aktaş, S., ''Influences of media on women's aesthetics and the role of midwife'', *Journal of Anatolian Nursing and Health Sciences*, 17 (3), 187-195, 2014.

[5] Vergallo, G-M., Marinelli, E., Napolitano, S., Di- Luca, M-N., & Zaami, S., '' Ethics and/or aesthetics? Reflections on cosmetic surgery for adolescent'', *Cuadernos De Bioética*, 29(96), 177-189, 2018. Doi: 10.30444/CB.5

[6] Yıldız, M., ''The effect of dysfunctional attitude and negative automatic thoughts on depression in university students'', *National Journal of Education Academy*, 1 (1), 1-7, 2017.

[7] Abbas, O.L., & Karadavut, U., ''Analysis of the factors affecting men's attitudes toward cosmetic surgery: body image, media exposure, social network use, masculine gender role stress and religious attitudes'', *Aesthetic Plastic Surgery*, 41, 1454–1462, 2017. Doi: 10.1007/s00266-017-0882-3.

[8] Güner- Küçükkaya, G., '' The role of the nurse in the pre-op psychosocial assessment in cosmetic surgery'', *Journal of Psychiatric Nursing*, 2 (2), 94-99, 2011.

[9] Erdoğan, Z., & Bulut, H., ''Nursing care in abdominoplasty'', *Journal of Education and Research in Nursing*, 16 (1), 41-47, 2019. Doi:10.5222/HEAD.2019.04

[10] Yılmaz Gören, Ş., ''Plastik ve rekonstrüktif cerrahi hastalarında ameliyat öncesi ve sonrası dönemde beden imajı ve benlik saygısının değerlendirilmesi'', *Mehmet Akif Ersoy Üniversitesi Sağlık Bilimleri Enstitüsü Dergisi*, 4 (2), 61-73.

[11] Ahmad, M., Mohmand, H., & Ahmad, N., ''Views of college students on plastic surgery'', *World Journal of Plastic Surgery*, 2 (2), 104-110, 2013.

[12] Penrattanahiran, R., ''Acceptance of cosmetic surgery and self-esteem among university students'', *Veridian E-Journal*, 12 (1), 946-962, 2019.

[13] Alhan, D., Şahin, I., Özer, F., Zor, F., Nişancı, M., Öztürk, S., Eski, M & Işık, S., ''Our ten years experıence ın breast reconstructıon'' *Turkish Journal of Plastic Surgery*, 20 (1), 1-6.

[14] Kozak, K., Wojcik, R., Czerwonka, M., Mandzıuk, S., Madej-Czerwonka, B., ''Oncoplastic breast surgery techniques- A new look at surgical treatment of breast cancer'', *Current Issues Pharmacy and Medical Sciences*, 31(3), 131-134,2018. Doi:10.1515/cipms-2018-0025

[15] Henderson-King, D., & Henderson-King, E., ''Acceptance of cosmetic surgery: Scale development and validation'', *Body Image*, 2 (2), 137–149, 2005. Doi: 10.1016/j.bodyim.2005.03.003

[16] Karaca, S., Karakoç, A., Onan, N., & Kadıoğlu, H., '' Validity and reliability of the Turkish version of the Acceptance of Cosmetic Surgery Scale (ACSS)'', *Journal of Psychiatry Nursing*, 8 (1), 17-22, 2017. Doi: 10.14744/phd.2017.72692

[17] Şahin, N., & Batıgün, A., ''Fonksiyonel olmayan tutumlar ölçeği kısa formu (Fotö-17) uyarlama çalışması'', *Türk Psikoloji Yazıları*, 19 (38), 91-99, 2016.

[18] Barlas, G.Ü., Karaca, S., Onan, N., Öz, Y.C., Gürkan, A., Işık, I. & Sümeli, F., '' Body image, dysfunctional attitudes, and depression in aesthetic surgery patients'' *Turkish Journal of Plastic Surgery*, 22 (3), 108-113, 2014.

[19] Chioqueta A. P., & Stiles T. C., ''Factor structure of the dysfunctional attitude scale (Form A) and the automatic thoughts questionnaire: an exploratory study'', *Psychological Reports*, 99 (1), 29-247, 2006. Doi:10.2466/pr0.99.1.239-247

[20] Karayiğit, N., '' Sosyo-ekonomik düzeyin psiko-sosyal gelişim ve dindarlığa etkileri'', *Pamukkale Üniversitesi İlahiyat Fakültesi Dergisi*, 4 (7), 119-133, 2017.

[21] Slevec, J., & Tiggemann, M., ''Attitudes toward cosmetic surgery in middle-aged women: body image, aging anxiety, and the media'', *Psychology of Women Quarterly*, 34(1), 65-74, 2010. Doi:10.1111/j.1471-6402.2009.01542.x

[22] Simis, K-J., Verhulst, F-C., & Koot, H-M., '' Body image, psychosocial functioning, and personality: how different are adolescents and young adults applying for plastic surgery?'', *Journal of Child Psychology and Psychiatry*, 42(5), 669-678, 2001. Doi: 10.1017/S002196300100734X.

[23] Furnham, A., & Levitas, J. ''Factors that motivate people to undergo cosmetic surgery'', *Canadian Journal of Plastic Surgery*, 20 (4), 47-50, 2012. Doi:10.4172/plastic-surgery.1000777.

International Journal of Health Services Research and Policy
www.dergipark.org.tr/ijhsrp
IJHSRP
e-ISSN: 2602-3482

Research Article

MATERNAL AND NEONATAL OUTCOMES OF CESAREAN SECTION IN OBESE AND MORBID OBESE TERM PREGNANT WOMEN

***Abdulbari ALTIN*[1] *Reyhan GÜNDÜZ*[2] *Fatih Mehmet FINDIK*[2] *Rezan BUĞDAY*[3]**
***Senem Yaman TUNÇ*[2] *Talip GÜL*[2]**

(1) Muş Varto State Hospital, Department of Obstetrics and Gynecology /Muş/Turkey
(2) Dicle University, Faculty of Medicine, Department of Obstetrics and Gynecology/Diyarbakır/Turkey
(3) Cizre Dr. Selahattin Cizrelioğlu State Hospital, Department of Obstetrics and Gynecology /Şırnak/Turkey
Corresponding author; ryhn.gunduz@gmail.com
https://orcid.org/0000-0002-2564-2435

Abstract: *The study aims to compare preoperatively, intraoperatively, and postoperatively the maternal and neonatal outcomes of normal-weight, obese, and morbid obese pregnant women who delivered by cesarean section in our clinic. This study retrospectively included 151 singleton pregnancies delivered at ≥37 weeks of gestation by cesarean section. Demographic, clinical, and neonatal results of the patients were noted and compared between the groups. Among the pregnant women included in this study, the length of postoperative hospital stay and presence of chronic diseases were determined to be significantly higher in the morbid obese group compared with other groups ($p<0.05$). In the morbid obese group, the average infant birth weight and the number of infants monitored due to respiratory distress as a neonatal complication were determined to be significantly higher ($p<0.05$). The presence of pregnancy complications, particularly the presence of gestational diabetes mellitus and preeclampsia were found to be significantly higher in the morbid obese group ($p<0.05$). We determined that the incidence of maternal and neonatal complications increases as the body mass index (BMI) increases. Therefore, it is evident that monitoring the BMI and preventing obesity would be effective in avoiding complications.*

Keywords: *Cesarean section, maternal obesity, maternal complication, neonatal complication*

Received: September 4, 2021 *Accepted: March 28, 2022*

1. Introduction

Overweight and obesity are defined as the abnormal or excess accumulation of fat that may disrupt health. As a norm, females have more body fat than males and it is generally accepted that women with a body fat percentage higher than 30% and males with a body fat percentage higher than 25% are obese. The World Health Organization (WHO) categorizes those with a body mass index (BMI, kg/ m2) of 18.5 or lower as underweight, those with a body mass index between 18.5 and 24.9 as normal-weight, those with a body mass index between 25 and 29.9 as overweight and those with a body mass index of 30 or higher as obese. Obesity is also characterized based on BMI as grade I (BMI 30-34.9), grade II (BMI 35-39.9), and grade III (BMI ≥40) [1].

Currently, obesity presents itself as one of the most important health concerns of recent years, with a rapidly increasing prevalence, a negative impact on public health and the future, and a resulting rise in the health expenditures of nations. Obesity, which is considered a complex and multifactorial

disorder, is currently the second most significant cause of preventable death after smoking. It is associated with a multitude of morbidities such as diabetes, cardiovascular diseases, hypertension, hyperlipidemia, cerebrovascular disease, various cancers, obstructive sleep apnea syndrome, non-alcoholic fatty liver, gastroesophageal reflux, bile duct disease, polycystic ovarian syndrome, infertility, osteoarthrosis and depression [2].

Obesity is linked to a continual increase in morbidity-mortality and a related rise in expenditures. One study has determined that the annual health expenditures increase proportionally as more patients become obese [3].

In our country, with the rapid lifestyle change, obesity has become a problem associated with a gradually increasing prevalence. In 2016, WHO reported that there were 16.092.644 obese individuals in Turkey and that Turkey presented the highest prevalence of obesity in Europe with a rate of 29.5% [4]. In the 2017 report of the Organization for Economic Cooperation and Development (OECD), the average rates of obesity and overweight in adults aged between 20 and 79 years were respectively 19.4% and 34.5% across 34 countries in 2015, while these rates were 22.3% and 33.1% in Turkey [5].

As the prevalence of obesity increases, the number of overweight and obese women of reproductive age also increases. In the United States of America, the prevalence of obesity among pregnant women varies between 18.5% and 38.3% [6].

Maternal overweight and obesity are linked to various adverse obstetric outcomes. Maternal complications include hypertension, diabetes, asthma, sleep apnea, thromboembolic disease, increased surgical site infections and more prevalent cesarean deliveries, endometritis, and anesthetic complications (primarily, intubation difficulties and epidural anesthesia). Neonatal complications include congenital malformations, large for gestational age (LGA) infants, stillbirth, shoulder dystocia, and long-term complications (obesity and diabetes) [7].

The complications of obesity, which has a prevalence that is gradually increasing worldwide and is associated with numerous adverse pregnancy outcomes, should be identified and prevented. The present study aims to compare the maternal and neonatal outcomes of normal-weight, obese and morbid obese pregnant women who delivered by cesarean section in our clinic preoperatively, intraoperatively, and postoperatively.

2. Materials and Methods

This study retrospectively evaluated a total of 151 normal-weight, obese and morbid obese pregnant women who were admitted to the Gynecology and Obstetrics Clinic of Dicle University between January 1, 2019 - December 31, 2019, and delivered singleton babies at ≥37 weeks of gestation by cesarean section. This study was granted approval by Dicle University Faculty of Medicine Ethics Committee (Date: 07.05.2020, Number: 154).

Pregnant women with vaginal delivery, preterm delivery, multiple pregnancies, placental position and invasion anomalies, coagulation disorder, and intrauterine fetal death were excluded from this study.

Patients' demographic data, gestational age at delivery, presence of maternal chronic diseases, history of prior maternal operations, presence of pregnancy complications, indications for cesarean section, type of anesthesia in cesarean delivery, type of skin and uterine incision, presence of intraoperative and postoperative complications, length of postoperative hospital stay (days), 1-minute and 5-minute APGAR scores, infant birth weight, presence of neonatal complications were obtained from patient files and surgical notes by scanning the hospital information management system archives.

The heights and weights of the pregnant women included in the study were measured by nurses at the clinic using an electronic scale of the brand TESS. BMI values of the patients computed in the first trimester or before pregnancy were noted. As accepted by the U.S. Institute of Nutrition and Food [8], the 151 cases included in the study were evaluated within three separate groups based on the BMI

values that were determined using the data obtained via the weight and height assessment. Accordingly, pregnant women with a BMI between 18.5–24,9 kg/ m2 were considered normal-weight, pregnant women with a BMI between 30–39,9 kg/ m2 were considered obese and pregnant women with a BMI > 40 kg/ m2 morbid obese. The three groups included in the evaluation were assessed based on preoperative, intraoperative, and postoperative maternal and neonatal outcomes.

As antepartum complications, the patients were evaluated with regard to preeclampsia-eclampsia, gestational hypertension, gestational diabetes mellitus (GDM), post-term pregnancy, intrauterine growth retardation, and deep vein thrombosis.

The patients were evaluated with regard to intestinal injury, bladder injury, uterine atony as intraoperative complications; and with regard to surgical site infections, thromboembolism, fever, whether a relaparotomy was performed and the length of postoperative hospital stay as postoperative complications.

Pregnant women included in the evaluations were also compared with respect to the type of anesthesia, type of skin and uterine incision, hypogastric-uterine artery ligation, balloon tamponade use, whether a drain was placed, and the indication for cesarean section.

Infants were evaluated by neonatologists accompanying the cesarean delivery. The three groups were compared with regard to neonatal birth weight, 1-minute and 5-minute APGAR scores, respiratory distress syndrome, early neonatal sepsis, neonatal respiratory distress, and the number of neonates admitted to the service to be monitored.

Statistical analysis was performed using the SPSS 21 statistics program package. Whether the variables conformed to a normal distribution was analyzed using histogram graphs and the Kolmogorov Smirnov test. Descriptive analyses were presented using mean, standard deviation, median values. Categorical variables were compared using the Pearson Chi-Square Test. In the comparison of variables with a non-normal distribution (nonparametric variables) across BMI groups, the Kruskal Wallis test was used. In the comparison of the changes in the preoperative-postoperative values between the BMI groups, repeated measures analysis was used. Cases associated with a p-value lower than 0.05 were evaluated as statistically significant results.

3. Results

This study included a total of 151 pregnant women, of whom 41 were normal-weight, 71 were obese and 39 were morbid obese. Mean BMI (33,79± 7,83), mean age (31,50± 5,9), and other demographic data for all pregnant women are presented in Table-1.

Table 1. Demographic characteristics of the patients

	X̄± SD	**Median**
Body mass index	33.79± 7.83	33.70
Age	31.50± 5.91	32.00
Gravidity	4.58± 2.45	4.00
Parity	2.95± 2.17	3.00
Number of living children	2.77± 2.03	3.00
Gestational age	38.02± 2.20	38.10
Number of abortions	0.64± 0.92	0.00

When the antepartum data of the pregnant women included in the study were compared between the three groups; we determined the presence of gestational complications to be significantly higher in the morbid obese group compared with the normal-weight and obese groups. It was also found to be significantly higher in the obese group compared with the normal-weight group ($p<0.05$). GDM and the number of preeclamptic pregnant women were found to be higher in the morbid obese group compared with the other groups. The presence of chronic diseases was significantly higher in the morbid obese

group compared with the other groups ($p<0.05$). The chronic disease that was detected the most frequently in the morbid obese group was heart disease. The three groups were not significantly different with regard to prior operations and indications for cesarean section ($p>0.05$) (Table 2).

Table 2. Comparison of antepartum data

		BMI						
		Normal-weight		Obese		Morbid obese		p
		n	%	n	%	n	%	
Chronic disease	None	36	87.80	54	76.06	21	53.85	0.002**
	Hypertension	0	.00	5	7.04	0	.00	
	Diabetes mellitus	0	.00	0	.00	2	5.13	
	Heart disease	3	7.32	4	5.63	5	12.82	
	Asthma	0	.00	1	1.41	4	10.26	
	Thyroid disease	0	.00	6	8.45	3	7.69	
	Other	2	4.88	1	1.41	4	10.26	
Prior operations	None	10	24.39	18	25.35	10	25.64	0.666
	Cesarean	29	70.73	50	70.42	28	71.79	
	Appendectomy	2	4.88	2	2.82	0	.00	
	Uterine surgery	0	.00	1	1.41	0	.00	
	Other	0	.00	0	.00	1	2.56	
Prior operations	No	10	24.39	18	25.35	10	25.64	0.991
	Yes	31	75.61	53	74.65	29	74.36	
Pregnancy complication	GDM[a]	3	7.32	8	11.27	7	17.95	
	Preeclampsia	1	2.44	3	4.23	7	17.95	
	IUGR[b]	2	4.88	2	2.82	1	2.56	
	Postterm pregnancy	0	.00	0	.00	0	.00	
	Eclampsia	0	.00	0	.00	0	.00	
	DVT[c]	0	.00	0	.00	0	.00	
Pregnancy complication	No	35	85.37	58	81.69	24	61.54	0.020*
	Yes	6	14.63	13	18.31	15	38.46	
Indications for cesarean section	Repeat cesarean	29	70.73	50	70.42	27	69.23	0.586
	Fetal distress	2	4.88	1	1.41	2	5.13	
	Malpresentation	4	9.76	8	11.27	3	7.69	
	Cephalopelvic disproportion	2	4.88	5	7.04	1	2.56	
	Severe preeclampsia	1	2.44	1	1.41	3	7.69	
	Fetal anomaly	2	4.88	3	4.23	0	.00	
	Elective	0	.00	2	2.82	3	7.69	
	Failure to progress	1	2.44	1	1.41	0	.00	

Chi-square Test;* $p<0.05$; **$p<0.01$ [a]Gestational diabetes mellitus; [b]Intrauterine growth retardation; [c]Deep vein thrombosis

When the intraoperative and postoperative data were compared across the three groups, it was found that patients in the morbid obese group had a significantly longer postoperative hospital stay than the other two groups. It was also found to be significantly longer in the obese group compared with the normal-weight group ($p<0.05$). The groups were not significantly different with regard to other data (Table 3).

Table 3. Comparison of intraoperative and postoperative data

		BMI						
		Normal-weight		Obese		Morbid obese		p
		n	%	n	%	n	%	
Anesthesia type	Spinal	39	95.12	66	92.96	34	87.18	0.392
	General	2	4.88	5	7.04	5	12.82	
Skin incision type	Pfannenstiel	41	100.00	71	100.00	39	100.00	
	UM[d]	0	.00	0	.00	0	.00	
	UM + LM[e]	0	.00	0	.00	0	.00	
Uterine incision type	LST[f]	41	100.00	71	100.00	39	100.00	
	Classic	0	.00	0	.00	0	.00	
Hypogastric artery ligation	No	41	100.00	71	100.00	39	100.00	
	Yes	0	.00	0	.00	0	.00	
Uterine artery ligation	No	41	100.00	71	100.00	37	94.87	0.054
	Yes	0	.00	0	.00	2	5.13	
Balloon tamponade	No	41	100.00	71	100.00	39	100.00	
	Yes	0	.00	0	.00	0	.00	
Abdominal drain	No	40	97.56	71	100.00	37	94.87	0.177
	Yes	1	2.44	0	.00	2	5.13	
Percutaneous drain	No	41	100.00	71	100.00	38	97.44	0.236
	Yes	0	.00	0	.00	1	2.56	
Intraoperative complications	None	41	100.00	71	100.00	37	94.87	0.054
	Intestinal injury	0	0.00	0	.00	0	0.00	
	Bladder injury	0	0.00	0	.00	0	0.00	
	Uterine atony	0	0.00	0	.00	2	5.13	
Postoperative complications	None	41	100.00	68	95.77	35	89.74	0.192
	Surgical site infection	0	.00	3	4.23	3	7.69	
	Fever	0	.00	0	.00	1	2.56	
	Relaparotomy	0	.00	0	.00	0	.00	
	Thromboembolism	0	.00	0	.00	0	.00	
		X̄± SD	**Median**	**X̄± SD**	**Median**	**X̄± SD**	**Median**	
	Postoperative hospital stay (days)	1.88±0.46	2.00	1.99±0.60	2.00	2.38±1.02	2.00	0.014*

Chi-square Test, Kruskal Wallis Test; *p<0.05
[d]Upper midline; [e]Upper midline and Lower midline;[f] Lower segment transverse

When the neonatal data were compared, infant birth weight was determined to be significantly higher in the morbid obese group compared with the normal-weight and obese groups. It was also found to be significantly higher in the obese group compared with the normal-weight group (p<0.05). As neonatal complications, the number of neonates monitored due to respiratory distress was determined to be significantly higher in the morbid obese group (p<0.05). The three groups were not significantly different with regard to 1-minute and 5-minute APGAR scores (p>0.05) (Table 4).

Table 4. Comparison of neonatal data

		BMI						
		Normal-weight		Obese		Morbid obese		p
		n	%	n	%	n	%	
Neonatal complications	None	30	73.17	56	78.87	28	71.79	0.022*
	Respiratory distress-monitoring	10	24.39	4	5.63	10	25.64	
	arly-onset neonatal sepsis	0	.00	3	4.23	1	2.56	
	Respiratory distress syndrome	0	.00	4	5.63	0	.00	

	Normal-weight		Obese		Morbid obese		
	X̄± SD	Median	X̄± SD	Median	X̄± SD	Median	
1-minute APGAR	5.83±1.34	6.00	5,52±.98	6.00	5.59±1.07	6.00	0.189
5-minute APGAR	8.37±.66	8.00	8,15±.75	8.00	8.08±.74	8.00	0.283
Infant birth weight	3069.88±349.06	3075.00	3300.99±418.87	3300.00	3363.41±476.07	3300.00	0.002**

Chi-square Test; Kruskall Wallis Test; *p<0.05;** p<0.01

4. Discussion

Obesity is a significant health problem worldwide and it has been stressed that maternal obesity has a negative impact on pregnancy outcomes, constituting a risk factor for complications such as GDM, infectious morbidity, postpartum hemorrhage, large for gestational age infants, and even stillbirth [9]. Thus, complications associated with obesity need to be identified and prevented. Therefore, the present study aimed to compare the maternal and neonatal outcomes of normal-weight, obese and morbid obese pregnant women who delivered by cesarean section in our clinic preoperatively, intraoperatively, and postoperatively and to discuss our findings in light of current literature data.

In a study conducted by Melchor et al. that compared normal-weight and obese patients, obese patients were determined to have a higher risk of preeclampsia, while there was no difference with regard to GDM. The two groups were not different in terms of preterm delivery, stillbirth, and neonatal mortality. Their study found that the presence of chronic hypertension was significantly higher in the obese group [10]. In a prospective study performed by Tasdemir et al., obese and non-obese patients were compared. Obese patients were determined to have a significantly higher prevalence of GDM and hypertension [11]. In a study conducted in China on 9516 normotensive patients, the risk of preeclampsia was 1.81 times higher in obese pregnant women compared with those that were non-obese. Meanwhile, the risk of preeclampsia was found to be 2.28 times higher in those with excessive gestational weight gain. Moreover, the authors stressed that there was a synergistic relationship between preeclampsia, weight gain during pregnancy, and obesity [12]. Our study also determined the presence of gestational complications to be significantly higher in the morbid obese group when compared with the normal-weight and obese groups. Particularly, we determined the number of GDM and preeclamptic patients to be higher in the morbid obese group. At the same time, the presence of chronic diseases was also found to be significantly higher in the morbid obese group compared with the other groups. The difference of our study from these previous studies is that morbid obese patients were included as well. In line with the literature, we found that gestational complications and the presence of chronic diseases among the patients increased as weight gain increased. With regard to this situation that constitutes a significant risk for maternal and neonatal mortality, we can say that patients should conceive after reaching a normal BMI in the pre-pregnancy period or that their pregnancy should be monitored in consideration of these complications and risks after they conceive.

In a study by Vegel et al. in which obese and non-obese patients who were delivered by cesarean section were compared, obesity was reported to be an independent risk factor for surgical site infections.

No difference was determined between the two groups in terms of the length of stay at the hospital [13]. In a Finnish study, it was reported that obese women had a higher relaparotomy risk compared to women with a BMI of 20-30 kg/ m2, with no difference in terms of intraoperative injuries (organ injuries and lacerations) or bleeding [14]. In our study, only women who delivered by cesarean section were examined. There were first pregnancies as well as repeat pregnancies among those examined. It was found that, as the primary method that is also preferred in the literature, the Pfannenstiel incision was the preferred cesarean section incision method. When the complication rates are considered, the overall number of surgical site infections among all patients was only six (3.97%). There was no significant difference between normal-weight and obese or morbid obese groups in terms of intraoperative complications. Although our study did not observe a difference between the groups with regard to intraoperative complications and the cesarean procedure, the length of postoperative hospital stay in days was significantly higher in the morbid obese group. We think this stems from the fact that we provide adequate postoperative care in our clinic to minimize the occurrence of postoperative complications.

In a study performed by Baser et al., it was found that in obese patients the infant birth weights were higher, the number of macrosomic fetuses was higher and the pH value was lower in neonates. No difference was reported in 1-minute and 5-minute APGAR scores [15]. In the study by Melchor et al., neonatal outcomes; fetal macrosomia, rate of admission to neonatal intensive care unit, and low pH values were determined to be significantly higher in the obese group. However, it was reported that no difference was found in terms of neonatal mortality [10]. In agreement with the studies in the literature, our study determined that infant birth weights and the number of infants monitored for respiratory distress were significantly higher in the morbid obese group and that there was no difference in terms of 1-minute and 5-minute APGAR scores. As understood from these results, in addition to its adverse maternal effects, obesity also has adverse neonatal effects, and thus, we must be attentive to the newborn infants of obese and morbid obese patients as well.

Our study is superior to others in that it was performed at a tertiary hospital and that we differentiated the patients as normal-weight, obese, and morbid obese, comparing them in three groups. The limitation of our study is that we accessed our data via the hospital records system and the amount of weight gain during pregnancy could not be obtained. Another limitation of our study is that only patients who were delivered by cesarean section were included and cesarean section is performed by different specialists in our clinic.

5. Conclusion

Maternal obesity is closely associated with complications that have an adverse impact on maternal and neonatal health during pregnancy. For protection against the negative effects of maternal obesity on maternal and neonatal health, it is needed to regulate maternal diet during pregnancy and ensure weight gain at a recommended level. For protection against pregnancy complications, obese women should be recommended to lose weight before pregnancy in a planned manner and conceive after they reach the ideal weight limits. For this purpose, we would like to stress the importance of informing obese women with respect to an adequate, balanced diet and weight control starting from pre-pregnancy, screening them for complications that may occur during pregnancy, and providing close and stringent follow-up.

Ethical Statements: This study was granted approval by Dicle University Faculty of Medicine Ethics Committee (Date: 07.05.2020, Number: 154).

Acknowledgment: None

Conflict of interest: All authors declare no conflict of interest.

Authors' Contributions:

A.A: Conceptualization, Methodology, Formal analysis, Writing - Original draft preparation (%40)

R.G: Conceptualization, Writing - Original draft preparation, Investigation (%15)
F.M.F: Conceptualization, Methodology, Formal analysis (%10)
R.B: Conceptualization, Investigation (%10)
S.Y.T: Conceptualization, Methodology, Investigation (%15)
T.G: Conceptualization, Investigation (%10).
All authors read and approved the final manuscript.

References

[1] Flegal, K.M., Carroll, M.D., Kuczmarski, R.J., et al. "Overweight and obesity in the United States: prevalence and trends, 1960–1994", *Int J Obes Relat Metab Disord*, 22, 39–47, 1998.

[2] *Obezite Tanı ve Tedavi Kılavuzu*. Türkiye Endokrinoloji ve Metabolizma Derneği, Ankara, 2018.

[3] Andreyeva, T., Sturm, R., Ringel, J.S., "Moderate and severe obesity have large differences in health care costs", *Obes Res*., 12(12), 1936-43, 2004.

[4] Özkan Sevencan, N., Ertınmaz Özkan, A., "Bir Üniversite Hastanesinin 3 Yıllık Obezite ve Diyabet Prevalansı: Erişkin ve Çocukluk Çağı Verilerinin Retrospektif Analizi", *Türk Diyab Obez*., 1, 31-36, 2019.

[5] Müftüoğlu, S., Küçükağdaş, Ş., "Assessment of Appetite Control and Food Craving Status of Individuals after Bariatric Surgery", *Bes Diy Derg*, 47(2), 30-39, 2019.

[6] Cogswell, M.E., Serdula, M.K., Hungerford, D.W., et al. "Gestational weight gain among average-weight and overweight women- what is excessive?", *Am J Obstet Gynecol*., 172, 705–12, 1995.

[7] Yogev, Y., Catalano, P.M., "Pregnancy and obesity", *Obstet Gynecol Clin North Am*., 36, 285–300, 2009.

[8] Report of the committee on nutritional status during pregnancy and lactation, food and nutrition Board, Institute of Medicine (United States). *Nutrition during pregnancy*. National Academy Press., Washington DC, pp: 1-233, 1999.

[9] Sebire, N.J., Jolly, M., Harris, J.P., et al. "Maternal obesity and pregnancy outcome: a study of 287,213 pregnancies in London", *Int J Obes Relat Metab Disord*., 25(8), 1175-1182, 2001.

[10] Melchor, I., Burgos, J., Campo, A.D., Aiartzaguena, A., Gutiérrez, J., Melchor, J.C., "Effect of maternal obesity on pregnancy outcomes in women delivering singleton babies: a historical cohort study", *J. Perinat. Med*., 47(6), 625–630, 2019.

[11] Taşdemir, D., Karaman, E., Yıldız, A., Han, A., Karaman, Y., Talay, H., "The Effect of Obesity on Maternal and Fetal Outcomes in Term Pregnant Women: A Case-Control Study", *İKSST Derg*, 7(2), 73-78, 2015.

[12] Shao, Y., Qiu, J., Huang, H., et al. "Pre-pregnancy BMI, gestational weight gain and risk of preeclampsia: a birth cohort study in Lanzhou, China", *BMC Pregnancy Childbirth*., 17(1), 400, 2017.

[13] Vegel, A.J., Benden, D.M., Borgert, A.J., Kallies, K.J., Kothari, S.N., "Impact of Obesity on Cesarean Delivery Outcomes", *WMJ*, 116(4), 206-209, 2017.

[14] P Allasmaa, N., Ekblad, U., Aıtokallıo-Tallberg, A., et al. "Cesarean delivery in Finland: maternal complications and obstetric risk factors", *Acta Obstet Gynecol Scand*., 89, 896-902, 2010.

[15] Başer, E., Aydoğan Kırmızı, D., Onat, T., Kara, M., Yalvaç, ES., "The Effect Of Body Mass Index On Pregnancy And Neonatal Results", *Bozok Med J*., 9(3), 76-80, 2019.

International Journal of Health Services Research and Policy
www.dergipark.org.tr/ijhsrp

IJHSRP

e-ISSN: 2602-3482

Research Article

PERCEPTION OF CONTROL, DISEASE, AND VACCINE FOR COVID-19: THE EXAMPLE OF HEALTHCARE PROFESSIONALS

Havva KAÇAN [1] ***Gülşen Ulaş KARAAHMETOĞLU*** [2] ***Vasfiye BAYRAM DEĞER*** [3]*

[1,2] Kastamonu University, Faculty of Health Science, Kastamonu, Turkey
[3]Mardin Artuklu University, Faculty of Health Science, Mardin, Turkey
*Corresponding author: vasfiyedeg@gmail.com

Abstract*: The study was conducted to examine the relation between control perception, disease perception, and vaccine perception of healthcare employees regarding Covid-19. The median and min-max scores of the participants in the sub-dimension of the disease perception scale were found to be 4.00 (1.33 - 5.00) for dangerousness and 4.00 (1.00 - 5.00) for contagiousness. The control perception scale scores of healthcare professionals were 2.50 (1.00 - 5.00) for macro-control, 3.00 (1.00 - 4.75) for micro-control, and 3.25 (1.00 - 5.00) for controllability. The score of a positive attitude toward the COVID-19 vaccine of the health employees who accepted to participate in the study was found as 4.00 (1.00 - 5.00) and the negative attitude score towards the vaccine was 3.40 (1.00 - 5.00). In our study, a statistically significant difference was found between positive attitudes towards the vaccine and professional experience scores ($p<0.05$). A statistically significant difference was also detected between the positive attitude scores of the participants towards the vaccine and the variables of direct contact with a COVID-19 patient and chronic disease status ($p<0.05$). It was determined that healthcare professionals had high Covid-19 disease and control perceptions and negative attitudes towards the vaccine. When the roles and responsibilities of immunization and health workers in controlling pandemics are considered, it is recommended to organize training programs to eliminate the doubts of healthcare employees regarding the safety and efficacy of the Covid-19 vaccine and to maximize the acceptance of the vaccine.*

Keywords: *Healthcare Employee, Covid-19 Control Perception, Covid-19 Disease Perception, Covid-19 Vaccine Perception, Vaccine Hesitancy*

Received: August 17, 2021 *Accepted: March 10, 2022*

1. Introduction

The covid-19 virus has spread all over the world in a short time after emerging in Wuhan, China, and causing severe pneumonia [1, 2]. It was declared a pandemic by the World Health Organization after a total of 118 thousand people in 114 countries were infected with the virus as of March 11, 2020, and 4 thousand 291 people died because of it [3]. Despite the protective measures and quarantine after the declaration of the pandemic, the number of cases still continues to increase gradually [4]. Despite the protective measures and quarantine after the announcement of the pandemic, the number of cases continued to increase.

Healthcare employees who are in close contact with infected people are at high risk of outbreaks [5-7]. Although healthcare staff who deal with the diagnosis, treatment, and care of patients diagnosed

with Covid-19 experience problems in this process, they continue to support society in the measures they must take against the pandemic [8, 9]. On the one hand, healthcare staff tries to fight the rapidly spreading Covid-19 pandemic and provide one-to-one care to patients who are in direct contact with the agent, on the other hand, they also fulfill their responsibilities as a part of the society [10, 11]. It is important for healthcare staff to be informed about the disease and take preventive measures for Covid-19 as well as for their patients [10]. Because when healthcare employees become infected, the reaction of the healthcare system to the pandemic decreases, and thus, the incidence rate increases uncontrollably by affecting the provision of healthcare services negatively [4]. The measures taken by the healthcare professionals are as important as the measures taken by the institutions in controlling the Covid-19 pandemic [10, 12]. On the other hand, the knowledge and attitudes of healthcare professionals towards infectious diseases [7, 13], and their perceptions and attitudes regarding Covid-19 disease will also have positive effects on keeping the pandemic under control [13].

Another important issue in controlling the pandemic is immunization. When it is considered that the Covid-19 virus spreads rapidly causing deaths, an effective vaccine is needed [2]. Although it is certain that mass vaccination will be very beneficial, it must not be expected to eliminate the disease from being an important issue. There are serious uncertainties regarding the effectiveness of vaccines in individual protection, to what extent they can protect people with severe illness, the degree of immunity, and how long they will last [4]. The perceptions of healthcare employees, who have the power to influence society, on the disease and control of Covid-19, as well as their perceptions on vaccines are curious issues. Yekdeş et al. (2020), who examined the attitudes of doctors towards immunization, reported that 52.3% of the doctors in the Internal Sciences Department did not take an immunization anamnesis, and 58.8% of the doctors in the Department of Surgical Sciences did not take immunization anamnesis from their patients [14]. In the same study, 10.5% of the doctors said that they had hesitations about vaccination. Immunization services are among life-long primary healthcare services, and acquisitions can be easily lost because of the recent increase in vaccine refusal cases. Doctors question immunization status in their daily practices to decrease the hesitancy of vaccination, which is seen in healthcare employees, and which may affect the individuals they serve, providing the required service when deficiencies are detected in immune anamnesis of patients, and including immune services in all steps may reduce the rates of not being vaccinated. These days when the pandemic is still ongoing, the hesitation of healthcare employees regarding the Covid-19 vaccine can affect the individuals they serve negatively. For this reason, the effectiveness of healthcare employees on society should not be forgotten to prevent vaccine rejection and control the pandemic. When the roles and responsibilities of healthcare workers are considered, healthcare employees have key roles in keeping the pandemic under control and in decreasing the burden [15]. It must not be forgotten that vaccine rejection is an important issue because it will cause pandemics [16].

The purpose was to examine healthcare employees' control perception, disease perception, and perception of the Covid-19 vaccine that was developed during the pandemic.

The hypothesis of the Study

- There is a relation between the Control Perception, Disease Perception, and Vaccination Perception of Healthcare Staff regarding Covid-19.

- There is no relation between the Control Perception, Disease Perception, and Vaccination Perception of Healthcare Staff regarding Covid-19.

2. Material and Methods

2.1. Type of Study

The study had a cross-sectional and descriptive design to examine the relationship between the control perception, disease perception, and vaccine perception of healthcare staff.

2.2. Study Population and Sampling

The population of the study consisted of 746 health personnel working in the Training and Research Hospital in a province. In calculating the sample size, the formula used when the number of elements in the population was known was used and the sample size was determined to be at least 256 healthcare workers [17] The research was conducted with 354 healthcare professionals who agreed to participate in the study.

2.3. Data Collection Tools

The data collection form of the research consists of the Descriptive Data Form and The Perception and Attitude Scales Related to the Covid-19 Scale.

2.4. Descriptive data Form

The data collection form of the research consists of the Descriptive Data Form and The Perception and Attitude Scales Related to the Covid-19 Scale.

2.5. The Perception and Attitude Scales Related to the Covid-19 Scale

The validity and reliability study of the scale was conducted by Geniş et al. The Cronbach Alpha value was calculated as 0.74. The scale consists of five different subdimensions. (1) COVID-19 Disease Perception Scale, (2) Perception of Causes of COVID-19 Scale, (3) Perception of Control of COVID-19 Scale, (4) COVID-19 Avoiding Attitudes Scale, (5) Attitudes towards COVID-19 Vaccine Scale [18].

The subdimensions of the Perception of Control of COVID-19 Scale, the COVID-19 Disease Perception Scale, and the Attitudes towards COVID-19 Vaccine Scale were used in the study.

The Perception of Control of COVID-19 Scale: The scale consists of 12 items. The scale has a 5-point Likert design. The expressions of the scale are “I strongly disagree (1)”, “I disagree (2)”, “I am indecisive (3)”, “I agree (4)”, and “I strongly agree (5)”. It consists of three subdimensions, which are Macro Control, Personal (Micro) Control, and Controllability. Macro Control is about beliefs about the effectiveness of the measures taken at institutional, national, or global levels. The second subdimension, which is also called Personal Control, is about the effectiveness of the personal precautions taken to avoid the disease. The final subdimension evaluates the perception of the controllability of the disease. The items in the controllability subdimension are scored reversely. A value between 1-and 5 is obtained by dividing the total score that is obtained by adding the scores of the items in the subdimension by the number of items in that subdimension. High scores in the Macro Control subdimension reflect the belief that the measures are adequate, high scores in the personal control dimension reflect the belief that personal control measures can provide good control of the disease, and high scores in the controllability subdimension reflect the belief that the disease can be controlled. The reverse items are coded as 1→5; 2→4; 3→3; 4→2; 5→1.

COVID-19 Disease Perception Scale: The scale consists of 7 items. The scale, which has a 5-point Likert design, consists of two subdimensions "Dangerousness" and "Infectiousness". The

expressions on the scale are "I strongly disagree (1)", "I disagree (2)", "I am indecisive (3)", "I agree (4)", and "I strongly agree (5)". The first subdimension, which is called "Dangerousness", includes perceptions and beliefs about the danger of COVID-19. The second component, which is called "Infectiousness", consists of items on perceptions of the infectiousness of the disease. Some items in the Dangerousness subdimension are reverse coded. A value between 1 and 5 is obtained by dividing the total score obtained by adding the item scores in the subdimension by the number of items in that subdimension. A high score in the dangerousness subdimension shows that the perception of the dangerousness of the disease is high, and a high score in the infectiousness subdimension shows that the perception of infectiousness of the virus is high. Reverse items are coded as 1→5; 2→4; 3→3; 4→2; 5→1.

Attitudes Towards COVID-19 Vaccine Scale: The scale has 9 items and 2 subdimensions (positive and negative attitudes). The expressions of the scale are "I strongly disagree (1)", "I disagree (2)", "I am indecisive (3)", "I agree (4)", and "I strongly agree (5)". Items in negative attitude subdimensions are scored reversely. A value between 1 and 5 is obtained by dividing the total score obtained by adding the item scores in the scale subdimension by the number of items in that subdimension. A high score in the positive attitude subdimension shows that the attitude towards vaccination is positive. The items in the negative attitude subdimension are calculated after they are reversed, and a high score in this subdimension shows that the negative attitude towards vaccination is less. Reverse items are coded as 1→5; 2→4; 3→3; 4→2; 5→1.

2.6. Data Collection

The data were collected face-to-face by the researchers with the healthcare staff under Covid-19 measures. Questionnaires and scales were filled out by the participating healthcare staff.

2.7. Data Analysis

SPSS 22.0 program was used for statistical analysis in the study. Number, percentage, median, and minimum-maximum values were used as descriptive statistical methods in the evaluation of the data. Kolmogorov-Smirnov and Shapiro-Wilk tests were applied to determine whether the dependent variables showed normal distribution according to descriptive features. Non-parametric hypothesis tests were applied to determine the differences in the variables that did not satisfy the normal distribution assumption. In the analysis of the data, as non-parametric methods, the Mann-Whitney U test was used to compare the quantitative continuous data between two independent groups, and the Kruskal Wallis Test was used to compare the quantitative continuous data between more than two independent groups. After the Kruskal Wallis Test, the Mann-Whitney U test was used as a complement to determine the differences. Spearman Correlation Analysis was applied between the continuous variables of the study. Correlation analysis is applied to determine the strength (degree) and direction of the linear relationship between continuous variables (http://www.istatistikanaliz.com/regression_analizi.asp).

The findings were evaluated at the 95% confidence interval and the 5% significance level.

Ethical Considerations

Written permissions were obtained from the Turkish Republic Ministry of Health, and Kastamonu Training and Research Hospital; and Ethics Committee Approval was obtained from Kastamonu University Clinical Research Ethics Committee with the decision number 2020-KAEK-143-79, and date 06.5.2021. The permission for using the scale was taken from the author.

3. Results

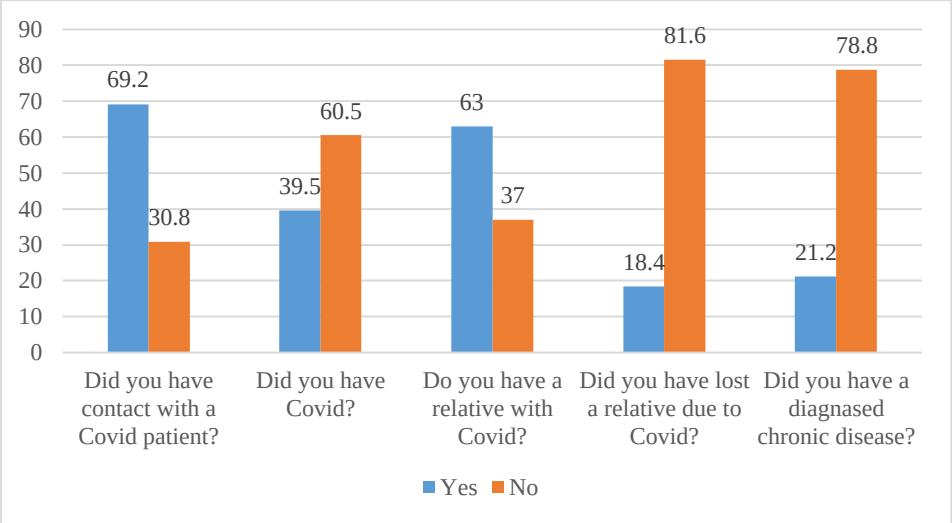
A total of 68.4% of the healthcare staff who were included in the scope of the study were women, 33.9% were between the ages of 18-29, 61.0% were married, 56.5% were nurses/midwives, 33.3% had 0-5 years of professional experience, and 43.5% were working in the service (Table 1).

Table 1. Descriptive Characteristics of Healthcare Staff

Variable	n	%
Gender		
Female	242	68.4
Male	112	31.6
Age		
18-29	120	33.9
30-39	113	31.9
40-49	92	26.0
50-59	29	8.2
Marital Status		
Married	216	61.0
Single	138	39.0
Profession		
Doctor	64	18.1
Nurse/Midwife	200	56.5
Pharmacist	14	4.0
Other	76	21.5
Professional Experience (Years)		
0-5	118	33.3
6-10	97	27.4
11-15	55	15.5
16-20	28	7.9
21 +	56	15.8
Unit Worked		
ICU	56	15.8
Service	154	43.5
Emergency	27	7.6
Other	117	33.1

A total of 69.2% of the participants stated that they had direct contact with Covid-19 patients, 60.5% had not Covid-19, 63.0% were the relatives of those who had Covid-19, 81.6% lost their relatives due to Covid-19, and 78.8% had a chronic disease (Graphic 1).

When the Cronbach Alpha values of the scales were examined according to the data of the study, it was found to be 0.62 (quite reliable) on the Disease Perception Scale, 0.66 (quite reliable) on the Control Perception Scale, and 0.81 (highly reliable) in the Attitudes Towards Vaccination Scale (Table 2).



Graphic 1. Characteristics of Healthcare Employees regarding the Disease

Table 2. Distribution of Mean Sub-Scale Scores of Healthcare Staff and Cronbach Alpha Values

Subdimension	n	Median	Min - Max	Cronbach Alpha Value
Disease Perception Scale				
Dangerousness	354	4.00	1.33 - 5.00	0.62
Infectiousness	354	4.00	1.00 - 5.00	
Control Perception Scale				
Macro control	354	2.50	1.00 - 5.00	
Micro control	354	3.00	1.00 - 4.75	0.66
Controllability	354	3.25	1.00 - 5.00	
Attitudes Towards Vaccination Scale				
Positive attitude	354	4.00	1.00 - 5.00	0.81
Negative attitude	354	3.40	1.00 - 5.00	

When the median and min-max scores of the scale sub-dimensions of the participants were evaluated, the dangerousness score was 4.00 (1.33 - 5.00), the contagiousness score was 4.00 (1.00 - 5.00); the macro-control score was 2.50 (1.00 - 5.00), micro control score was 3.00 (1.00 - 4.75), controllability score was 3.25 (1.00 - 5.00); positive attitudes towards the vaccine score were 4.00 (1.00 - 5.00), and negative attitudes towards the vaccine score were 3.40 (1.00 - 5.00) (Table 2).

No significant differences were detected between gender and sub-dimension scores ($p > 0.05$). When the macro-control sub-dimension median and min-max scores were analyzed according to marital status and being in direct contact with Covid-19 patients, the scores of singles were 2.63 (1.00 - 5.00) compared to married people with 2.25 (1.00 - 4.75), and those who did not have direct contact with Covid-19 patients had a higher score of 2.50 (1.00 - 5.00) compared to those who had direct contact with 2.25 (1.00 - 4.75) ($p<0.05$).

A statistically significant difference was detected between the median and min-max scores of the micro control subscale and the Covid-19 status variable ($p<0.05$). It was found that the scores of those without Covid-19 were higher with 3.00 (1.00 - 4.75) than those who had it with 2.75 (1.00 - 4.75).

A statistically significant difference was detected between the median and min-max scores of the dangerousness sub-dimension and the variable of direct contact with Covid-19 patients ($p<0.05$). Those who had direct contact with Covid-19 patients scored 4.00 (1.67-5.00) higher than those who did not have direct contact with 3.85 (1.33-5.00). A statistically significant difference was found between the

contagious median and min-max scores and the age variable ($p<0.05$). It was found that the score of those aged 18-29 age range was higher at 4.00 (1.33 - 4.75) the score of those aged 30-39 age range was higher at 4.00 (1.00 - 5.00) than those in the 40-49 age range with 3.67 (1.00 - 5.00).

Statistically significant differences were found between the median and min-max scores of the macro-control sub-dimension and the occupation, professional experience, and the unit worked variables ($p<0.05$). The scores of the nurses/midwives were 2.50 (1.00 - 5.00) and the scores of the others (health technicians, EMTs, paramedics) were found to be higher than 2.00 (1.00 - 4.25). It was determined that the scores of those with 16 - 20 years of professional experience were lower with 1.75 (1.00 - 3.25) than the scores of those with 0-5 years with 2.75 (1.00 - 4.50) and 21+ years with 2.50 (1.00 - 4.75). The scores of those working in the Emergency Department were higher with 2.75 (1.25 - 4.50) than the others (medical technician, emergency room, and paramedic) with 2.25 (1.00 - 4.25).

Table 3. Comparison of the Descriptive Characteristics of the Healthcare Staff and their Mean Scores in Attitudes towards Covid-19 Vaccine Scale

Variable		Positive attitude		Negative attitude	
	n	Median (Min-Max)	Test-p	Median (Min-Max)	Test-p
Gender					
Female	242	3.75 (1-5)	*MWU*=12310.0	3.40 (1-5)	*MWU*=13109.5
Male	112	4.00 (1-5)	p=0.164	3.40 (1.80-5)	p=0.620
Age					
18-29	120	3.63 (1-5)		3.40 (1-5)	
30-39	113	4.00 (1-5)	x^2= 5.700	3.40 (1.40-5)	x^2=1.375
40-49	92	4.00 (1-5)	p=0.127	3.40 (1.60-5)	p=0.711
50-59	29	4.00 (2-5)		3.40 (2.40-5)	
Marital Status					
Married	216	4.00 (1-5)	*MWU*=13434.0	3.40 (1.40-5)	*MWU*=13777.0
Single	138	3.75 (1-5)	p=0.116	3.40 (1-5)	p=0.228
Professional					
Doctor	64	4.25 (1.75-5)		3.70 (1.80-5)	
Nurse/Midwife	200	3.75 (1-5)	x^2= 6.521	3.40 (1-5)	x^2= 6.909
Pharmacist	14	3.75 (1.25-4.50)	p=0.089	3.20 (2.40-4.60)	p=0.075
Other	76	4.00 (1-5)		3.60 (2-5)	
Professional experience(Year)					
0-5	118	3.50 (1-5)		3.40 (1-5)	
6-10	97	4.00 (1-5)	x^2= 23.568	3.40 (1.40-5)	x^2= 5.534
11-15	55	3.75 (1.50-5)	*p=0.001***	3.40 (2.40-5)	p=0.237
16-20	28	4.00 (1.50-5)	*5>1, 5>3*	3.50 (1.60-5)	
21 +	56	4.25 (2-5)		3.40 (1.80-5)	
Unit worked					
Intensive care	56	4.00 (1-5)		4.00 (1.60-5)	
Service	154	3.75 (1-5)	x^2= 4.010	3.40 (1-5)	x^2= 1.274
Emergency	27	4.00 (1.75-5)	p=0.260	3.40 (1.80-4.60)	p=0.735
Other[a]	117	4.00 (1-5)		3.40 (1.40-5)	

[a]Healthcare Health technician, EMT, Paramedic; Kruskal Wallis test; MWU=Mann Whitney-U; **p<0.01

No significant differences were found as a result of the Mann Whitney U and Kruskal Wallis Tests, which were used to determine the relationships between the sub-dimension median and min-max scores of the attitude towards the Covid-19 vaccine, and the variables of gender, age, marital status,

occupation, and unit of working (p>0.05). Statistically significant differences were detected between the positive attitude towards vaccination sub-dimension scores and the professional experience variable (p<0.05). Those who had 21+ years of professional experience had 4.25 (2-5) higher scores than those with 0-5 years of 3.50 (1-5) and 11-15 years of 3.75 (1.50-5) professional experience (Table 3).

Table 4. Comparison of Disease Status and Attitudes of Health Staff Towards COVID-19 Vaccine Scale Mean Scores

		Positive attitude		Negative attitude	
Variable	**n**	**Median (Min-Max)**	**Test-p**	**Median (Min-Max)**	**Test-p**
Did you have direct contact with a Covid-19 patient?					
Yes	245	4.00 (1-5)	*MWU*=11215.5	3.40 (1.40-5)	*MWU*=12516.0
No	109	3.75 (1-5)	p=0.016*	3.40 (1-5)	p=0.345
Did you have COVID?					
Yes	140	4.00 (1-5)	*MWU*=14175.0	3.40 (1.40-5)	*MWU*=14638.0
No	214	3.75 (1-5)	p=0.443	3.40 (1-5)	p=0.720
Did you have a relative with Covid-19?					
Yes	223	4.00 (1-5)	*MWU*=13801.5	3.40 (1-5)	*MWU*=11771.5
No	131	3.75 (1.25-5)	p=0.385	3.60 (2-5)	p=0.002**
Did you have a relative you lost due to Covid-19?					
Yes	65	4.00 (1-5)	MWU=8834.5	3.40 (1-5)	*MWU*=8634.5
No	289	3.75 (1-5)	p=0.452	3.40 (1.40-5)	p=0.307
Do you have any diagnosed chronic diseases?					
Yes	75	4.50 (1-5)	*MWU*=7649.0	3.40 (1.40-5)	*MWU*=10217.5
No	279	3.75 (1-5)	p=0.001**	3.40 (1-5)	p=0.755

MWU=Mann Whitney-U; *p<0.05; **p<0.01

Statistically significant differences were found between the median and min-max scores of positive attitude towards the vaccine and the variable of direct contact with COVID-19 patients and chronic disease status (p<0.05). Those who had direct contact with Covid-19 patients scored 4.00 (1-5) when compared to 3.75 (1-5) in those who did not have direct contact. The scores of those who had the chronic disease were higher at 4.50 (1-5) than the scores of those who did not have a chronic disease at 3.75 (1-5). Statistically significant differences were detected between the negative attitude towards the vaccine sub-dimension scores and the variable of being related to COVID-19 (p<0.05). The mean score of those who did not have COVID-19 in their relatives was 3.60 (2-5) higher than those who had 3.40 (1-5) (Table 4).

Table 5. Relation between the subdimensions of the disease perception, perception of control, and attitude towards vaccine scales

		Dangerousness	Infectiousness	Macro control	Micro control	Controllability	Vaccine positive	Vaccine negative
Dangerousness	$r_{Spearman}$	1.000						
	p	0.000						
Infectiousness	$r_{Spearman}$	0.307	1.000					
	p	0.000**	0.000					
Macro control	$r_{Spearman}$	-0.236	-0.020	1.000				
	p	0.000**	0.351	0.000				
Micro control	$r_{Spearman}$	-0.067	0.092	0.391	1.000			
	p	0.103	0.042*	0.000**	0.000			
Controllability	$r_{Spearman}$	0.184	-0.131	-0.094	-0.118	1.000		
	p	0.000**	0.007**	0.038*	0.013*	0.000		
Vaccine positive	$r_{Spearman}$	0.259	0.265	-0.011	0.051	-0.033	1.000	
	p	0.000**	0.000**	0.418	0.168	0.266	0.000	
Vaccine negative	$r_{Spearman}$	0.335	0.109	-0.205	-0.178	0.170	0.358	1.000
	p	0.000**	0.020*	0.000**	0.000**	0.001**	0.000**	0.000

*p <0.05 ; **p <0.01

A weak, positive and significant relationship was detected between dangerousness and infectiousness; a weak and a negative relation was detected with macro control; a very weak and a positive relation was detected with controllability; a weak and a positive relation was detected with a positive attitude towards a vaccine, and a weak and a positive relation was detected with a negative attitude towards a vaccine. A very weak, positive, and significant relation was detected between infectiousness and micro-control; a very weak and negative relation was detected with controllability; a weak and positive relationship was detected with the positive attitude towards vaccine; and a very weak, positive, and significant relation was detected with a negative attitude towards a vaccine.

A weak, significant and positive relationship was detected between macro-control and micro-control; a very weak and negative relation was detected with controllability; and a very weak, negative, and significant relationship was detected with a negative attitude towards a vaccine. A weak, significant, and negative relationship was detected between macro-control and controllability; and a very weak and negative relation was detected with a negative attitude towards a vaccine. A very weak, positive, and significant relation was detected between controllability and a negative attitude towards a vaccine. A weak, positive and significant relationship was detected between a positive attitude towards a vaccine and a negative attitude towards a vaccine.

4. Discussion and Conclusions

The Covid-19 pandemic, which has caused fear, anxiety, and uncertainty all over the world, is still continuing. Wu et al. (2009) demonstrated the need to understand possible psychosocial effects of the pandemic among healthcare employees during the easily transmitted, rapidly spreading SARS epidemic in 2009 [19]. It was emphasized in previous epidemics (SARS) that healthcare employees were under intense stress because of fear of becoming ill, fear of transmitting the infection to their families, and heavy workload, and healthcare providers needed to balance their basic “duty to treat” with their duty to their families and loved ones during pandemics. Again, studies conducted on the SARS epidemic determined that the epidemic posed an enormous physical and emotional burden for healthcare employees who were on the first line in the fight against the disease [1]. Healthcare employees also faced the risk of losing their lives in the social support setting which decreased significantly during pandemics [20]. For these reasons, the perceptions of healthcare employees, who are the most affected

group in the Covid 19 pandemic, regarding the disease, their opinions on control measures, and their attitudes towards the vaccine, are extremely important. The conspiracy theories regarding the disease, which have been on the agenda since the early days of the pandemic, maintain their place in the vaccine-related process. Also, the practices, statements, and attitudes of healthcare professionals are considered among the most influential factors in the behavior of society regarding disease and vaccination [21].

When the disease perception scale sub-dimension scores of the participants were examined, it was found that the dangerousness score was 4.00 (1.33 - 5.00), and the mean infectiousness score was 4.00 (1.00 - 5.00) (Table 2). According to our study data, healthcare professionals said that they perceived the disease as very dangerous, and it was highly contagious. Similarly, high-level anxiety was detected in a cross-sectional study that evaluated the COVID-19 pandemic perceptions of healthcare employees working in a chest diseases training hospital in Cluj-Napoca, Romania. Only 67 participants completed the disease perception questionnaire part of the study, in which 115 people participated, because of high anxiety levels (the rest did not fill the questionnaire because "they could not imagine themselves in that position (having the disease)" [22]. It can be interpreted as a natural result that healthcare employees have high anxiety levels about the perception of the disease because they are faced with a highly contagious, unknown disease and are at higher risk than other occupational groups in society.

The mean control perception scale macro-control score of the healthcare employees who participated in the study was 2.50 (1.00 - 5.00), the mean micro-control score was 3.00 (1.00 - 4.75), and the mean controllability score was 3.25 (1.00 - 5.00) (Table 2). Previous studies reported that healthcare employees who are at the forefront during pandemic periods are at risk for mental disorders (e.g. anxiety about infection, fatigue, burnout at work, and Post-Traumatic Stress Disorder (PTSD)) [23]. Again, in previous pandemic experiences (SARS), it was reported that the perceived dangerousness, uncertainty, and uncontrollability regarding the disease increased the probability of individuals developing PTSD [24]. It was reported in a study (2020) in which the results of 144 studies were evaluated that PTSD was detected in one out of every four healthcare employees during the SARS and Ebola periods [25]. Again, the inability to control the disease leads to the loss of life security, and the loss of life security is related closely to PTSD, and it is a fact that the mental health of healthcare employees is affected positively when they take infection control measures [26]. The infected healthcare employees reported in the SARS and MERS epidemics that they lost control of the disease in their professional lives when they took the role of being patients, and the lack of knowledge on the treatment and the processes of the disease also caused a loss of control feeling [25]. In treatment and prevention works, it was determined that employees could increase controllability with individual measures they took, and psychiatric symptoms could be decreased in more than 95% of employees with individual institutional measures [27]. Based on these findings, mental problems, especially PTSD symptoms, will be seen less in those who believe that control measures are taken for COVID-19 in the country and the entire world, and in those who think that the disease can be prevented and the pandemic can be controlled with personal measures, and this will be reflected in healthcare employees as a contribution in terms of high work efficiency, high morale, and strong social struggle.

The mean score of positive attitudes towards the COVID-19 vaccine of the healthcare employees who agreed to participate in the present study was 4.00 (1.00 - 5.00), and the mean score of negative attitudes towards the vaccine was 3.40 (1.00 - 5.00) (Table 2). It was determined in our study that positive and negative attitudes towards the vaccine were close to each other, and both were at a high level. Previous reports showed that the willingness to be vaccinated was between 60% and 90% among doctors in Greece (February 2020) and France (March-July, 2020) [28, 29], and between 40% and 60% among nurses in Hong Kong and China [30]. In a series of studies conducted in several countries, it was reported that vaccine acceptance rates ranged from as low as 27.7% in Congolese healthcare employees

[31] to over 95.0% in a study that included healthcare employees in the Asia-Pacific region [32]. Our findings are consistent with a study conducted in China on the general population, in which a low proportion of participants (0.7%) were unwilling to receive the vaccine [33]. However, our findings are also consistent with studies conducted in Europe and the USA, which reported a higher proportion of participants who were reluctant to vaccination. The reported rate was 15-26% in Italy [34], 26% in France [35], 29% in Poland [36], and 20% in the USA [37], and there were both positive and negative attitudes in our study. The main reason for the negative attitudes appears to be the concern that new vaccines will not be safe [35]. However, these reluctance levels to vaccinate against COVID-19 are alarmingly higher than the level of reluctance to usual vaccines [36]. The high positive-negative attitude level towards the vaccine in our study may also be because of the fact that Turkey has both Asian and European textures. Lazarus et al. reported that there were significant differences in the willingness to be vaccinated in Asian and European countries, stating that 80% of those who approached the vaccine positively tended to be from Asian countries, which could be because of the fact that their general population is from societies such as China, Singapore, and South Korea that have a strong trust in central governments. Regarding healthcare employees, past experience with the pandemic influenza vaccine showed that not all healthcare employees may agree to be vaccinated against COVID-19 [38]. However, there is very little publication reporting healthcare employees agreeing to be vaccinated with COVID-19 vaccines; and as far as we are concerned, there are no publications about their intention to recommend these vaccines to their patients. According to a cross-sectional study (2020) conducted with practitioners who worked in France and the French-speaking areas of Belgium (Brussels, Wallonia), and nurses working in Quebec, Canada, 72.4% of healthcare employees favored being vaccinated with a future COVID-19 vaccine; and 79.6% would recommend it to their patients [39]. It is often mistakenly believed that the attitudes of healthcare employees towards vaccines should be positive because they have scientific and medical training. However, health employees are not a homogeneous group, and most of them are not experts in the field of vaccination [40]. Also, vaccination is not an essential part of the initial training of healthcare employees [41], and those who need further training in this area still tend to be "convinced" of the benefits of vaccinations by profession. Several studies show that there is vaccination hesitancy among healthcare employees at prevalence and intensity levels varying inversely with their education levels [42-44]. Verger et al. found that the perception that the safety of vaccines, which are developed in an emergency, cannot be guaranteed plays important role in the acceptance of COVID-19 vaccines. The same study also uncovered that distrust in the Ministry of Health also played role in the low acceptance levels of COVID-19 vaccines. Trust in institutions dealing with the vaccine is a key driver of vaccine acceptance, not only for the general population but also for healthcare employees, as long as the social context shapes how information is interpreted and used [42]. This confidence has been tested by several debates (e.g., the effectiveness of masks and certain old or new drugs) since the pandemic began. When the relatively low trust of healthcare employees in the pharmaceutical industry is considered, concerns are expressed that these attitudes may not be easily changed in some healthcare employees [40].

In the present study, statistically significant differences were found between the scores of the positive attitude towards the vaccine sub-dimension and the professional experience variable ($p<0.05$). Those who had 21+ years of professional experience had a higher score of 4.25 (2-5) (Table 3).

In a cross-sectional study conducted by Khan et al. (2014) in Saudi Arabia with 280 healthcare employees in two hospitals in the Qassim region, it was reported that experienced staff had more knowledge and positive attitudes than those who were relatively new in their field [45]. There are studies in the literature reporting the relations between professional experience and knowledge and attitudes as important, and experience affects the level of knowledge [46].

In the study, statistically significant differences were detected between the positive attitude of participants towards the vaccine sub-dimension score and the variables of direct contact with COVID-19 patients and chronic disease status ($p<0.05$). Those who had direct contact with Covid-19 patients scored 4.00 (1-5) when compared to 3.75 (1-5) in those who did not have direct contact, the scores of those who had the chronic disease were higher with 4.50 (1-5) than the scores of those who did not have a chronic disease with 3.75 (1-5) (Table 4). Similar to our study findings, in their study conducted in Thailand, Srichan et al. (2020) found high levels of knowledge and attitudes about COVID-19 among healthcare employees with chronic diseases [47]. High knowledge and attitude levels are some of the factors affecting the positive opinion regarding the vaccine. The fact that the mortality rates of the COVID-19 pandemic are much higher in individuals with chronic diseases means a further increase in the risk of healthcare employees who are already in the risk group. Again, similar to our study findings, Biswas et al. (2021) reported that the use of vaccines is common in healthcare employees who are at risk of contact with Covid -19. In connection with these reasons, positive attitudes are the expected results in this regard at the knowledge level and attitude level, and indirectly in terms of vaccine perspective.

Limitations of the Study

Healthcare employees who worked in a hospital of the Ministry of Health in Turkey were included in the study. For this reason, the results cannot be generalized to all healthcare staff. When the sub-dimension scores of the perception of illness of the participants were evaluated, the dangerousness score was 4.00 (1.33 - 5.00), and the contagiousness score was 4.00 (1.00 - 5.00). According to the study data, healthcare employees said that they perceived the disease as very dangerous and very contagious. The macro-control score of the healthcare employees who participated in the study was 2.50 (1.00 - 5.00), the micro-control score average was 3.00 (1.00 - 4.75), and the controllability score was 3.25 (1.00 - 5.00). The positive attitude score of the healthcare employees who participated in the study towards the COVID-19 vaccine was found to be 4.00 (1.00 - 5.00), and the negative attitude score towards the vaccine was 3.40 (1.00 - 5.00). In the study, it was also found that positive and negative attitudes towards the vaccine were close to each other and both were at a high level. A statistically significant difference was detected between the participants' positive attitude towards the vaccine sub-dimension score, the variables of direct contact with COVID-19 patients, and chronic disease status ($p<0.05$). Those who had direct contact with Covid-19 patients scored 4.00 (1-5) when compared to 3.75 (1-5) in those who did not have direct contact, and the scores of those who had the chronic disease were higher with 4.50 (1-5) than the scores of those who did not have a chronic disease with 3.75 (1-5).

In conclusion, to combat COVID-19, we must focus on research on vaccines and drugs, and work to prevent further spread [48]. Also, healthcare employees face more biological, chemical, ergonomic, physical, and psychosocial risks of infectious disease outbreaks when compared to the general population. If healthcare employees, who have to work more intensively during pandemic processes, become infected with the virus, which is the pandemic factor, the healthcare system will be affected adversely, and cause negative and severe consequences such as the spread of the disease and the further growth of the problem, the inability to meet the demands for healthcare services, and even the collapse of the healthcare system. There will be a much better-functioning healthcare system with effective and efficient healthcare policies intending to improve the working conditions of healthcare

employees, take all necessary measures to protect their health, and make them happy materially and morally. Also, immunization is the most effective method in the prevention of infectious diseases and the fight against pandemics. Right at this point, since there are no proven drugs for the treatment of COVID-19, there is no other option other than the vaccine. Vaccines are drugs, which are compulsory to be used today to protect the health and well-being of all individuals of all ages. Vaccine hesitancy is a complex phenomenon, especially in the agenda regarding new vaccines. As COVID-19 vaccines are made available, countries prioritized frontline healthcare employees as vaccine candidates. Since COVID-19 vaccines are approved rapidly, and vaccine development phases are accelerated, the legitimate concerns regarding vaccine safety, particularly regarding long-term adverse effects, cannot be ignored. Healthcare employees may also have negative attitudes as well as positive attitudes towards the vaccine. When the roles and responsibilities of immunization and healthcare employees in controlling the epidemics are considered, it is recommended to eliminate the doubts of healthcare employees about the safety and efficacy of the Covid-19 vaccine and to organize training programs to maximize the acceptance of the Covid-19 vaccine. However, regular monitoring of the attitudes and practices of healthcare employees towards COVID-19 vaccines in future periods is essential not only due to their role in vaccination campaigns but also because they are involved in the patient caregiving period. In this sense, increasing scientific publications is important in terms of contributing to the monitoring of this situation.

Ethical Considerations

Written permissions were obtained from the Turkish Republic Ministry of Health, and Kastamonu Training and Research Hospital, and Ethics Committee Approval were obtained from Kastamonu University Clinical Research Ethics Committee with the decision number 2020-KAEK-143-79, and date 06.5.2021. The permission for using the scale was taken from the author.

Authors' contributions

H.K.: Conceptualization, Methodology, Formal analysis, Writing - Original draft preparation, Investigation (%35).

G.U.K.: Conceptualization, Methodology, Formal analysis, Writing - Original draft preparation, Investigation (%35).

V.B.D.: Conceptualization, Methodology, Formal analysis, Writing - Original draft preparation, Investigation (%30).

All authors read and approved the final manuscript.

Acknowledgments: The authors are grateful to the nurses who participated in this study.

Conflicting Interest: The authors declared no potential conflicts of interest.

Funding: The author(s) received no financial support for the research and/or authorship of this study.

References

[1] Huang, L., Xu, FM., Liu H.R., "Emotional responses and coping strategies of nurses and nursing college students during COVID-19 outbreak", *MedRxiv*, Preprint, 2020. doi: https://doi.org/10.1101/2020.03.05.20031898.

[2] Li, Y.D., Chi, W.Y., Su, J.H., Ferrall, L., Hung, C.F., Wu T.C., "Coronavirus vaccine development: from SARS and MERS to COVID-19" *Journal of Biomed Sci*, 27(104), 1-24 https://doi.org/10.1186/s12929-020-00695-2. 2020.

[3] World Health Organization(2020). *Immunization, Vaccines and Biologicals* [Online]. Avaliable: https://www.who.int/teams/regulation-prequalification/eul/immunization-vaccines-and-biologicals.

[4] Azap, A., "Covıd-19 Vaccines: Light at the end of the Tunnel", *Archives Medical Review Journal*, 29, 94-100, 2020. doi:10.17827/aktd.841264

[5] Haviari, S., Bénet, T., Elahi, M.S., André, P., Loulergue, P., Vanhems, P., "Vaccination of healthcare workers: A review", *Human Vaccines & Immunotherapeutics*, 11(11), 2522-2537, 2015. doi: 10.1080/21645515.2015.1082014

[6] Lucia, V.C., Kelekar, A., Afonso, N.M., "Covıd-19 vaccine hesitancy among medical students", *Journal of Public Health*, 43(3), 445-449, 2021. doi:10.1093/PubMed/fdaa230

[7] Zhang, M., Zhou, M., Tang, F., Wang, Y., Nie, H., Zhangi L., You, G., "Knowledge, attitude, and practice regarding Covıd-19 among healthcare workers in Henan, China", *Journal of Hospital Infection*, 105, 183-187, 2020.

[8] Su, A.(2020, Feb. 25). *Doctors and nurses fighting coronavirus in China die of both infection and fatigue* [Online]. Avaliable: https://www.latimes.com/world-nation/story/2020-02-25/doctors-fighting-coronavirus-in-china-die-of-both-infection-and-fatigue

[9] Jankowicz, M. (2020). *An Italian coronavirus nurse posted a picture of her face bruised from wearing a mask to highlight how much health workers are struggling* [Online]. Avaliable: https://www.insider.com/coronavirus-italy-nurse-alessia-bonari-bruised-face-physical-psychological-toll-2020-3

[10] Sağlık Bakanlığı (2020). *Sağlık Bakanlığı Koronavirüs Rehberi* [Online]. Avaliable: https://hsgm.saglik.gov.tr/tr/bulasici-hastaliklar/2019-n-cov/liste/2019-ncov-afis-ve-brosurler.html%20.

[11] Askın, R., Bozkurt, Y., Zekiye, Z., "Covid-19 pandemisi: Psikolojik etkileri ve terapötik müdahaleler", İstanbul *Ticaret Üniversitesi Sosyal Bilimler Dergisi*, 19(37), 304-318, 2020.

[12] Ergün, E., Ergün, Ş., Çelebi, İ., "Acil sağlık hizmetleri personellerinin covid-19 hakkında bilgi, korunma düzeyleri ve etkileyen etmenler", *Paramedik ve Acil Sağlık Hizmetleri Dergisi,* 1(1), 16-27, 2020.

[13] Wang, C., Hornby, P.W., Hayden, F.G., Gao, G.F., "A novel coronavirus outbreak of global health concern", *Lancet*, 395(10223), 470-473, 2020. doi: 10.1016/S0140-6736(20)30185-9

[14] Yekdeş, D.H., Altunok, A., Eskiocak, M., Marangoz, B., "Immunization attitudes of physicians at a university hospital", *Klimik Dergisi, 33*(3), 255-9, 2020.

[15] Biswas, N., Mustapha, T., Khubchandani, J., Price, J.H., "The nature and extent of Covıd-19 vaccination hesitancy in healthcare workers", *Journal of Community Health*, 46, 1244-1251, 2021. https://doi.org/10.1007/s10900-021-00984-3,

[16] Ceyhan, M.(2020). *Aşı reddi* [Online]. Avaliable: https://docplayer.biz.tr/62696905-Asi-reddi-mehmet-ceyhan.html. 2020.

[17] Sümbüloğlu, K., Sümbüloğu, V., "*Biyoistatistik", Hatiboğlu Yayınları*. ISBN: 9789757527121. 14. Baskı, Ankara, 2018.

[18] Geniş, B., Gürhan, N., Koç, M., Geniş, Ç., Şirin, B., Çirakoğlu,O., Coşar, B., "Development of perceptıon and attıtude scales related wıth covıd-19 pandemıa", *Pearson Journal Of Socıal Scıences & Humanıtıes, 5*(7), 305-326, 2020.

[19] Wu, P., Fang, Y., Guan, Z., Fan, B., Kong, J., Yao, Z., Liu, X., Fuller, C.J., Susser, E., Lu, J., "The psychological impact of the SARS epidemic on hospital employees in China: Exposure, risk perception, and altruistic acceptance of risk", *The Canadian Journal of Psychiatry,* 54(5), 302-311, 2009.

[20] Stawicki, S.P., Paladino, L., Sharpe, R.P., Galwankar, S.C., Sholevar, F., Marchionni, C., Papadimos, T.J., Paul, E., Hansoti, B., Firstenberg, M. et al., "Reflections on the Ebola public health emergency of international concern, part 2: The unseen epidemic of posttraumatic stress among health-care personnel and survivors of the 2014–2016 Ebola outbreak", *J. Glob. Infect. Dis.*, 9, 45–50., 2017.

[21] Sallam, M., Dababseh, D., Eid, H., Al-Mahzoum, K., Al-Haidar, A., Taim, D., Mahafzah, A., "High rates of covıd-19 vaccine hesitancy and ıts association with conspiracy beliefs: A study in Jordan and Kuwait among other Arab countries", *Vaccines*, 9(1), 42, 2021.

[22] Man, M.A., Toma, C., Motoc, N.S., Necrelescu, O.L., Bondor, C.I., Chis, A.F., Rajnoveanu, R.M., "Disease Perception and Coping with Emotional Distress during COVID-19 Pandemic: A Survey among Medical Staff", *Int. J. Environ. Res. Public Health*, 17(13), 4899, https://doi.org/10.3390/ijerph17134899, 2020.

[23] El-Hage, W., Hingray, C., Lemogne, C., Yrondi, A., Brunault, P., Bienvenu, T., et al., "Health professionals facing the coronavirus disease 2019 (COVID-19) pandemic: What are the mental health risks?" *Encephale,* 46(3), 73–80, 2020. doi: 10.1016/j.encep.2020.04.008

[24] Wu, P., Fang, Y., Guan, Z., Fan, B., Kong, J., Yao, Z., Liu, X., Fuller, C.J., Susser, E., Lu, J., Hoven, C.W. "The psychological impact of the SARS epidemic on hospital employees in China: exposure, risk perception, and altruistic acceptance of risk", *Can J Psychiatry*, 54(5), 302-11, 2009. doi: 10.1177/070674370905400504

[25] Chew, Q.H., Wei, K.C., Vasoo, S., Chua, H.C., Sim, K., "Narrative synthesis of psychological and coping responses towards emerging infectious disease outbreaks in the general population: practical considerations for the COVID-19 pandemic", *Singapore Med J,* 61(7), 350-356, 2020. doi: 10.11622/smedj.2020046

[26] Preti, E., Di Mattei, V., Perego, G., Ferrari, F., Mazzetti, M., Taranto, P., Calati, R., "The psychological impact of epidemic and pandemic outbreaks on healthcare workers: a rapid review of the evidence", *Current Psychiatry Reports,* 22(8), 1-22, 2020.

[27] Tan, W., Hao, F., McIntyre, R.S., Jiang, L., Jiang, X., Zhang. L., Zhao, X., et al. "Is returning to work during the COVID-19 pandemic stressful? A study on immediate mental health status and psychoneuroimmunity prevention measures of Chinese workforce", *Brain, Behavior, and Immunity*, 87, 84-92, 2020. doi: 10.1016/j.bbi.2020.04.055

[28] Papagiannis, D., Malli, F., Raptis, D.G., Papathanasiou, I.V., Fradelos, E.C., Daniil, Z., et al., "Assessment of Knowledge, Attitudes, and Practices towards New Coronavirus (SARS-CoV-2) of Health Care Professionals in Greece before the Outbreak Period", *Int J Environ Res Public Health,* 17(14), 4925, 2020. https://doi.org/10.3390/ijerph17144925

[29] Gagneux-Brunon, A., Detoc, M., Bruel, S., Tardy, B., Rozaire, O., Frappe, P., et al., "Intention to get vaccinations against COVID-19 in French healthcare workers during the first pandemic wave: a cross-sectional survey", *J Hosp Infect*, 108, 168-73, 2021. https://doi.org/10.1016/j.jhin.2020.11.020, PMID: 33259883

[30] Wang, K., Wong, E.L.Y., Ho, K.F., Cheung, A.W.L., Chan, E.Y.Y., Yeoh, E.K., et al., Intention of nurses to accept coronavirus disease 2019 vaccination and change of intention to accept seasonal influenza vaccination during the coronavirus disease 2019 pandemic: A cross-sectional survey, *Vaccine*, 38(45), 7049-56, 2020. https://doi.org/10.1016/j.vaccine

[31] Kabamba Nzaji, M., Kabamba Ngombe, L., Ngoie Mwamba, G., Banza Ndala, D.B., Mbidi Miema, J., Lungoyo, C.L., Mwimba, B.L., Bene, A.C.M., Musenga, E.M., "Acceptability of Vaccination Against COVID-19 among Healthcare Workers in the Democratic Republic of the Congo", *Pragmatic Obs. Res*, 11, 103–109, 2020.

[32] Chew, N.W., Cheong, C., Kong, G., Phua, K., Ngiam, J.N., Tan, B.Y., Wang, B., Hao, F., Tan, W., Han, X., et al., "An Asia-Pacific study on healthcare worker's perception and willingness to receive COVID-19 vaccination", *Int. J. Infect. Dis*, Preprint, 2021. doi: 10.1016/j.ijid.2021.03.069

[33] Lazarus, J.V., Ratzan, S.C., Palayew, A., Gostin, L.O., Larson, H.J., Rabin, K., et al., "A global survey of potential acceptance of a COVID-19 vaccine", *Nat Med*, 27, 225–228, 2021. https://doi.org/10.1038/s41591-020-1124-9,.

[34] Graffigna, G., Palamenghi, L., Boccia, S., Barello, S., "Relationship between citizens' health engagement and intention to take the covid-19 vaccine in Italy: a mediation analysis", *Vaccines*, 8(576), 1-11, 2020. doi:10.3390/vaccines8040576

[35] Peretti-Watel, P., Seror, V., Cortaredona, S., Launay, O., Raude, J., Verger, P., "A future vaccination campaign against COVID-19 at risk of vaccine hesitancy and politicisation", *Lancet Infect Dis*, 20(7), 769–770, 2020.

[36] Feleszko, W., Lewulis, P., Czarnecki, A., Waszkiewicz, P., "Flattening the curve of COVID-19 vaccine rejection—a global overview", *Vaccines (Basel)*, 9(1), 44, 2020. doi:10.3390/vaccines9010044

[37] Thunstrom, L., Ashworth, M., Finnoff, D., Newbold, S., "Hesitancy towards a COVID-19 vaccine and prospects for herd immunity", *Ecohealth*, 1-17, 2021. doi: 10.1007/s10393-021-01524-0

[38] Bish, A., Yardley, L., Nicoll, A., Michie, S., "Factors associated with uptake of vaccination against pandemic influenza: a systematic review", *Vaccine*, *29*(38), 6472-84, 2011. https://doi.org/10.1016/j.vaccine.2011.06.107

[39] Verger, P., Scronias, D., Dauby, N., Adedzi, K.A., Gobert, C., Bergeat, M., Dubé, E., "Attitudes of healthcare workers towards COVID-19 vaccination: a survey in France and French-speaking parts of Belgium and Canada 2020", *Euro Surveill*, 26(3), 2002047, 2021. doi: 10.2807/1560-7917. ES.2021.26.3.2002047

[40] Raude, J., Fressard, L., Gautier, A., Pulcini, C., Peretti-Watel, P., Verger, P., "Opening the 'Vaccine Hesitancy' black box: how trust in institutions affects French GPs' vaccination practices", *Expert Rev Vaccines*, 15(7), 937-48, 2016. https://doi.org/10.1080/14760584.2016.1184092, PMID: 27140417,

[41] Kernéis, S., Jacquet, C., Bannay, A., May, T., Launay, O., Verger, P., et al., "EDUVAC Study Group. Vaccine Education of Medical Students: A Nationwide Cross-sectional Survey", *Am J Prev Med*, 53(3), e97-104, 2017. https://doi.org/10.1016/j.amepre.2017.01.014, PMID: 28237636,

[42] Yaqub, O., Castle-Clarke, S., Sevdalis, N., Chataway, J., "Attitudes to vaccination: a critical review", *Soc Sci Med*, 112, 1-11, 2014. https://doi.org/10.1016/j.socscimed.2014.04.018, PMID: 24788111

[43] Karlsson, L.C., Lewandowsky, S., Antfolk, J., Salo, P., Lindfelt, M., Oksanen, T., et al., "The association between vaccination confidence, vaccination behavior, and willingness to recommend vaccines among Finnish healthcare workers", *PLoS One*, 14(10), e0224330, 2019. https://doi.org/10.1371/journal.pone.0224330

[44] Wilson, R., Zaytseva, A., Bocquier, A., Nokri, A., Fressard, L., Chamboredon, P., et al., " Vaccine hesitancy and self-vaccination behaviors among nurses in southeastern France", *Vaccine*, 38(5), 1144-51, 2020. https://doi.org/10.1016/j.vaccine.2019.11.018

[45] Khan, M.U., Shah, S., Ahmad, A., Fatokun, O., "Knowledge and attitude of healthcare workers about the middle east respiratory syndrome in multispecialty hospitals of Qassim, Saudi Arabia", *BMC Public Health*, 14(1), 1-7, 2014.

[46] Tam, D.K.P., Lee, S., Lee, S.S. "Impact of SARS on avian influenza preparedness in healthcare workers", *Infection*, 35(5), 320-325, 2007. doi: 10.1007/s15010-007-6353-z

[47] Srichan, P., Apidechkul, T., Tamornpark, R., et.al, "Knowledge, Attitude and Preparedness to Respond to COVID-19 Among the Bordered Population of Northern Thailand in the Early Period of the Outbreak: A Cross-Sectional Study", *WHO South-East Asia Journal of Public Health*, 9(2), 118-125, 2020.

[48] Doğan, M., Bayraktar M., "COVID-19 with a Public Health Perspective: Measures Taken in Turkey and Public Compliance with the Measures", *Iran J Public Health*, 49(1), 67-75, 2020. http://ijph.tums.ac.ir.

International Journal of Health Services Research and Policy
www.dergipark.org.tr/ijhsrp

IJHSRP

e-ISSN: 2602-3482

Research Article

ASSESSMENT OF THE LEVEL OF RISK PERCEPTIONS AND RELATED PARAMETERS FOR THE COVID-19 PANDEMIC

Selva Dilan Golbası KOÇ[1] Selma METİNTAŞ[1] Ali KILINÇ[1] Sevda SUNGUR[1] Alaettin UNSAL[1] Didem ARSLANTAŞ[1] Muhammed Fatih ONSUZ[1]

[1]Eskisehir Osmangazi University Public Health Department, TURKEY
*Corresponding author; selvadilangolbasi@gmail.com

Abstract: *Assessment of risk perception in communities in the context of the COVID-19 pandemic is essential for organizing effective interventions. The study aims to determine the level of COVID-19 risk perception and the factors associated with it. It is a cross-sectional study in which 452 participants, who were employees of Eskisehir Osmangazi University, were included between December-2020 and January-2021. The COVID-19 risk perception level was assessed with nine questions by modifying the COVID-19 Instant Monitoring Turkey protocol study questions. The prepared questionnaire included variables of sociodemographic characteristics, transmission risk status, preparedness, self-efficacy, compliance with protective behaviors, actionism(ineffective protection behavior), and confidence in information sources/tools. The 25th percentile and lower scores were evaluated as having low-risk perception. The study data were evaluated with univariate and multivariate analysis. The participants had a mean age of 38.51±9.66 years (46.9% females, 53.1% males). The median COVID-19 risk perception score was 42(Interquartile range: 35-50). In this study, the low COVID-19 risk perception frequency was 26.3%. Being 40 years old and older (OR;%95CI: 1.76;1.12-2.76), a low level of compliance with protective behaviors (1.75;1.09-2.76), and low level of confidence in information sources/tools (2.37;1.49-3.78) were predictive for having a low level of risk perception of COVID-19. Those with a low COVID-19 risk perception were more likely to agree that the restrictions being applied were exaggerated (p=0.001). The most trusted sources of information about COVID-19 were the statements of health professionals and official institutions (p<0.001). Low-level risk perception was detected in one out of every four people in the study group. COVID-19 risk perception of individuals should be monitored since it is related to many parameters in epidemic management.*

Keywords: *Risk perception, COVID-19, risk factors, preparedness*

Received: January 04, 2022 *Accepted: April 04, 2022*

1. Introduction

As in past epidemics, being able to fight the COVID-19 epidemic effectively can be achieved by changing the behavior of individuals in accordance with the precautions. Perception of risk, which plays a role in recognizing the characteristics of communities, is an important component of behavior change theories [1]. Risk perception is a subjective judgment based on the characteristics, severity, and management of risk; it can be effective on the behavioral changes recommended to society in epidemics and relates to many parameters [2]. Features including sociodemographic characteristics, trust in information sources tools, being able to respond to the problems encountered during the pandemic management, level of preparedness and self-efficacy, political beliefs, and values are the factors that can affect the risk perception levels of communities [3, 4].

It has been reported that a positive relationship was found between risk perception levels and protective behaviors in many studies [5-8] conducted in the context of COVID-19 protective/preventive behaviors [9]. On the other hand, the low-risk perception may cause to adapt more slowly to the changes and the decisions taken and cause adaptation problems. Furthermore, this perception can lead to wrong decisions and risky behaviors when combined with rapid decision-making and high impulsivity. This may lead to an increase in ineffective precautionary behaviors (actionism) [3]. It has been confirmed that the negative consequences of disasters are associated with low-risk perception [10]. For these reasons, risk perception, along with some level of concern, can be a useful tool to encourage preparedness and better responsiveness in the health sector.

As the pandemic of the 21st century, COVID-19 has created fear, anxiety, and panic. Monitoring communities' risk perceptions and behaviors against COVID-19 has been one of the priority actions. A standard protocol has been developed to create a national series of cross-sectional studies with COVID-19 Snapshot MOnitoring (COVID-19 Instant Monitoring, COSMO), one of the most comprehensive studies in this field [11]. The purpose of the protocol is to enable rapid and adaptive monitoring of different populations over time by assessing the relationships between COVID-19 risk perception and information and misinformation, preparedness, and protective behavior. All over the world and in Turkey, the risk perceptions, knowledge, preparedness, and compliance levels of communities regarding COVID-19 have been evaluated by COSMO study reports [11, 12].

It can be said that after the first official COVID-19 case was reported in Turkey on March 11, 2020, the rapid increase in cases was controlled by strict social measures. However, in June 2020, a second wave of the epidemic was observed following the normalization period. The study was carried out to determine the risk perception levels of university employees and examine the related factors during the period when the effects of the second wave began to ease in Turkey.

2. Materials and Methods

2.1. Study design

The study is a cross-sectional study conducted on employees of Eskisehir Osmangazi University between December-2020 and January-2021. During this period, Turkey's daily number of new cases ranged between 5,277 and 33,198, while deaths were between 129 and 259 [13]. Ethical permission for the study was obtained from Eskisehir Osmangazi University Non-Interventional Clinical Research Ethics Committee.

2.2. Population and data collection

The population of the study consisted of 5600 people. It was calculated that at least 359 people should be reached (low prevalence of COVID-19 risk perception level 50%, confidence interval 95%, the margin of error 5%), and the questionnaire form links were sent to all employees via corporate e-mail, a total of 452 people formed the working group. In the links, information was given about the subject and purpose of the study. A total of 3 reminders were sent via e-mails and web page announcements.

2.3. Questionnaire form

The questionnaire form was prepared by modifying the COSMO protocol study questions and the literature [6, 12]. The prepared questionnaire included variables of sociodemographic characteristics, transmission risk status, preparedness, self-efficacy, compliance with protective behaviors, actionism(ineffective protection behavior), confidence in information sources/tools, and experiencing

problems in certain issues. The prepared questionnaire was uploaded to the Google Forms online platform. The consent of the participants was obtained in the questionnaire form.

In the study, COVID-19 risk perception levels of individuals were evaluated with nine questions in 7-point Likert-type by modifying the COVID-19 Instant Monitoring Turkey protocol questions. Perception of risk includes cognitive and emotional sub-headings within the framework of the concepts of perceived vulnerability and severity, which are suggested by two basic models (Conservation Motivation Theory and Health Belief Model). In evaluating risk perception, the self-reported possibility of being infected, susceptibility of being infected, disease severity in case of infection, and the anxiety that changing conditions may cause were taken into account. The scores obtained from the risk perception level questions ranged from 9 to 63. The internal consistency of the question group created to measure risk perception was 0.81, calculated with Cronbach's alpha coefficient.

The risk perception level of COVID-19 was accepted as "low" in those who scored 25th percentile (35) and below of the total score, "high" in those who scored 75th percentile (35) and above, and "moderate" in those who scored between 25th and 75th percentile. In order to evaluate the parameters that may be associated with the low COVID-19 risk perception level, moderate and high-risk perception groups were combined and ultimately grouped as "low-risk perception level" below the 25th percentile and "medium-high risk perception level" above the 25th percentile.

Those who had COVID-19 PCR positivity in their home or workplace nearby were taken as “the group at risk of transmission” and those who did not have positivity were taken as "the group, not at risk of transmission".

The level of preparedness-self-efficacy was evaluated with two questions in the 7-point Likert type. Those who scored in the 25th percentile and below (≤8 points) of the total score were considered to have a "low" level of preparedness-self-efficacy, while the others were considered "normal".

The level of adaptation to protective behaviors was related to the level of adaptation to situations that were removed, changed, and/or newly added in the context of social life during the epidemic; it was evaluated with eight questions in a 5-point Likert type. Those who scored in the 25th percentile and below (≤16 points) of the total score were accepted as "low", while the others were considered "normal". The Cronbach's alpha coefficient was calculated as 0.85.

The actionism level, which evaluates ineffective protection behaviors in the epidemic, was calculated with four questions with yes (1 point)/no (0 points) options questioned differently from other groups. Those who scored at or below the 25th percentile (≤1) of the total score were considered to have a “low” actionism level.

The level of trust in information sources/tools was evaluated with ten questions in a 7-point Likert type. Those who scored at the 25th percentile and below (≤30) of the calculated total score were considered "low", while the others were considered "normal". The Cronbach's alpha coefficient was calculated as 0.87.

2.4. Statistical analysis

The obtained data were evaluated using the SPSS Statistical Package Program (ver. 15.0, Chicago). The statistical significance value was $p \leq 0.05$. Quantitative data were presented with a mean (±standard deviation), median, 25th, and 75th percentile values. Non-parametric tests Mann-Whitney U and Kruskal Wallis were used because the data were not suitable for normal distribution. Frequency distribution was used to present descriptive features; the Chi-Square test was used to compare categorical variables. In further analysis, a multiple logistic regression model was applied. Low and medium-high risk perception groups were the dependent variables; gender, age group, COVID-19 transmission risk group, adaptation level to protective behaviors, and confidence level in information

sources/tools were independent variables. The model was established with variables that showed a significant level of p<0.10 in univariate analysis.

3. Results

The participants (46.9% females, 53.1% males) had a mean age of 38.51±9.66 years (Min-Max:19-64).

The median COVID-19 risk perception score was 42 (Min-Max:9-63, Interquartile Range:35-50). In this study, 119 (26.3%) of the participants had a "low" and 333 (74.7%) had a "medium-high" perception of COVID-19 risk.

The percentages of having a low level of risk perception were 13.4% under the age of 30, 29.4% between 30-39 ages, and 57.2% aged 40 and over. It was found that the low COVID-19 risk perception was higher in those aged 40 and over compared to other age groups (p=0.032).

It was found that the group who experienced a risk of transmission (59.7%) had a lower perception of COVID-19 risk than those who did not (40.3%) (p=0.029).

No relationship was found between low COVID-19 risk perception level and gender, educational status, presence of chronic disease, presence of children (<18 years old) or elderly (>65 years old) living in the same household, and the number of people living at home (Table 1).

Table 1. Distribution of risk perception levels for COVID-19 according to sociodemographic parameters and risk of transmission.

Parameters		Low (≤35) risk perception	Medium-high (>35) risk perception	Total	p
		n=119 (%)[b]	n=333 (%)[b]	n=452 (%)[b]	
Age groups	19 -29	16 (13.4)	71 (21.3)	87 (19.2)	0.032*
	30 -39	35 (29.4)	116 (34.8)	180 (33.5)	
	+40 [a]	68 (57.2)	146 (43.9)	185 (47.3)	
Gender	Female	47 (39.5)	165 (49.5)	212 (46.9)	0.059
	Male	72 (60.5)	168 (50.5)	240 (53.1)	
Education	High school and below	41 (34.5)	104 (31.2)	145 (32.1)	0.518
	University and above	78 (65.5)	229 (68.8)	307 (67.9)	
Number of people living in the household	Alone	8 (6.7)	42 (12.6)	50 (11.1)	0.174
	2	18 (15.1)	55 (16.5)	73 (16.2)	
	3 and above	93 (78.2)	236 (70.9)	329 (72.7)	
Presence of persons under 18 years of age living in the same household	Yes	67 (56.3)	164 (49.2)	231 (51.1)	0.186
	No	52 (43.7)	169 (50.8)	221 (48.9)	
Presence of persons over 65 years of age living in the same household	Yes	16 (13.4)	46 (13.8)	62 (13.7)	0.920
	No	103 (86.6)	287 (86.2)	390 (86.3)	
Presence of chronic disease	Yes	17 (14.3)	68 (20.4)	85 (18.8)	0.142
	No	102 (85.7)	265 (79.6)	367 (81.2)	
The state of having experienced a risk of transmission[c]	Those who experience the risk of transmission	71 (59.7)	235 (70.6)	306 (67.7)	0.029*
	Those who do not experience the risk of transmission	48 (40.3)	98 (29.4)	146 (32.3)	

[a]The group that makes the difference; [b]The column percentage; [c]Positivity in oneself, at home or workplace nearby; *p<0.05

Those with low COVID-19 risk perception were found to have lower levels of adherence to protective behaviors (39.5%, p=0.001) and levels of trust in information sources/tools (41.2%, p<0.001). No relationship was found between levels of preparedness-self-efficacy or actionism and having a low level of risk perception. The distribution of the levels of preparedness-self-efficacy, adaptability, actionism, and trust in information sources regarding the COVID-19 disease according to the risk perception levels is given in Table 2.

Table 2. Distribution of COVID-19 risk perception levels according to levels of preparedness-self-efficacy, compliance with protective behaviors, actionism, and confidence in information sources/tools.

Parameters		Low (≤35) risk perception	Medium-high (>35) risk perception	Total	p
		n=119 (%)[a]	n=333 (%)[a]	n=452 (%)[a]	
Levels of preparedness-self-efficacy	Low	38 (31.9)	97 (29.1)	135 (29.9)	0.566
	Normal	81 (68.1)	236 (70.9	317 (70.1)	
Levels of compliance with protective behaviors	Low	47 (39.5)	78 (23.4)	125 (27.7)	0.001**
	Normal	72 (60.5)	255 (76.6)	327 (72.3)	
Actionism (ineffective behavior) levels	Low	59 (49.6)	166 (49.8)	225 (49.8)	0.960
	Normal	60 (50.4)	167 (50.2)	227 (50.2)	
Levels of trust in information sources/tools	Low	49 (41.2)	80 (24.0)	129 (28.5)	0.001**
	Normal	70 (58.8)	253 (76.0)	323 (71.5)	

[a]The column percentage;**p<0.01

When the study group was asked to rate their level of trust in information sources/tools related to COVID-19 from 1 to 7, it was seen that the most trusted information sources were healthcare professionals (6 points) and press releases or statements of public institutions (5 points), respectively (p< 0.001) (Figure 1).

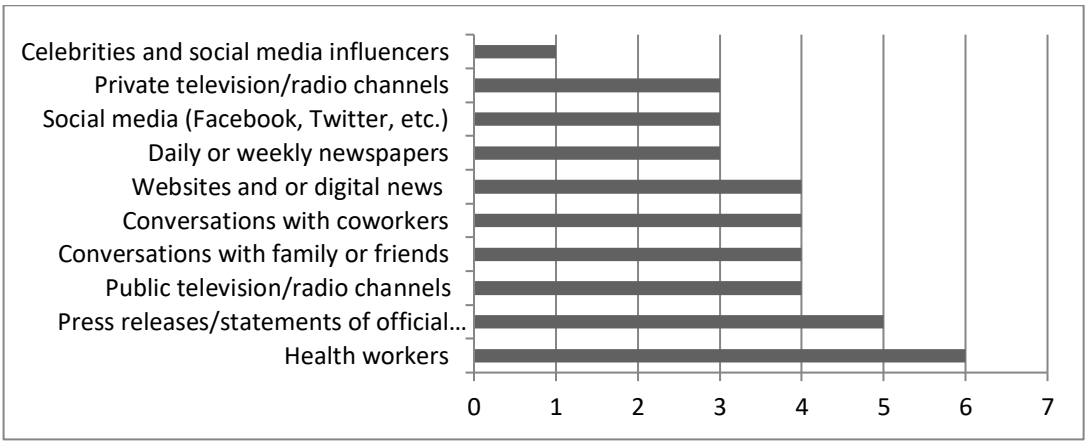


Figure 1. Median values of confidence scores in information sources/tools related to COVID-19.

It was found that those with a low COVID-19 risk perception level felt less lonely/helpless (54.6%), lost interest in things they enjoyed before (59.7%), and their sleep patterns were disrupted (58.8%). It was also found that they had fewer problems (34.5%) in their close relationships (Table 3).

Table 3. Distribution of cases of experiencing problems that may be encountered in the context of COVID-19 at least once, according to risk perception levels associated with COVID-19.

Problems that may be encountered in the context of COVID-19[c]	Low (≤35) risk perception	Medium-high (>35) risk perception	Total	p
	n (%)[d]	n (%)[d]	n (%)[d]	
I felt alone/helpless	65 (54.6)	251 (74.4)	316 (69.9)	0.001**
I've lost interest in things I've always enjoyed	71 (59.7)	271 (81.4)	342 (75.7)	0.001**
My sleep pattern is disturbed	70 (58.8)	249 (74.8)	319 (70.6)	0.001**
I took alcohol or sedatives	17 (14.3)	62 (18.6)	79 (17.5)	0.285
I was more nervous and angry than usual	58 (48.7)	221 (66.4)	279 (61.7)	0.001**
I have had problems with my spouse, family, or close relationships	41 (34.5)	168 (50.5)	209 (46.2)	0.008**
I have been subjected to physical violence	7 (5.9)	19 (5.7)	26 (5.8)	0.943
I witnessed physical violence	9 (7.6)	38 (11.4)	47 (10.4)	0.238

[c]Having problems at least once; [d]The column percentage;**p<0.01

In the further analysis, being 40 years old and older (OR;%95CI: 1.76;1.12-2.76), a low level of compliance with protective behaviors (1.75;1.09-2.76), and a low level of confidence in information sources/tools (2.37;1.49-3.78) were predictive for having a low level of risk perception of COVID-19. Multiple logistic regression results in determining the importance of variables on the perception of low and medium-high risk associated with COVID-19 are given in Table 4.

Table 4. Multiple logistic regression model results of variables associated with COVID-19 risk perception level.

Variables	OR	%95 CI	p
Gender			
(reference: Female)			
Male	1.553	0.996 -2.421	0.052
Age groups			
(reference: age <40)			
≥40 ages	1.762	1.123-2.764	0.014*
The state of having experienced a risk of transmission			
(reference: no)			
Yes	1.554	0.985-2.452	0.058
Level of compliance with protective behaviors			
(reference: normal)			
Low	1.745	1.089-2.794	0.021*
Level of trust in information sources			
(reference: normal)			
Low	2.373	1.492-3.775	0.001**
Constant	0.493	- -	0.026*

OR: Odd's ratio, CI: Confidence interval; *p<0.05; **p<0.01

Those with a low COVID-19 risk perception were more likely to agree that the restrictions being applied were exaggerated (p=0.001) (Figure 2).

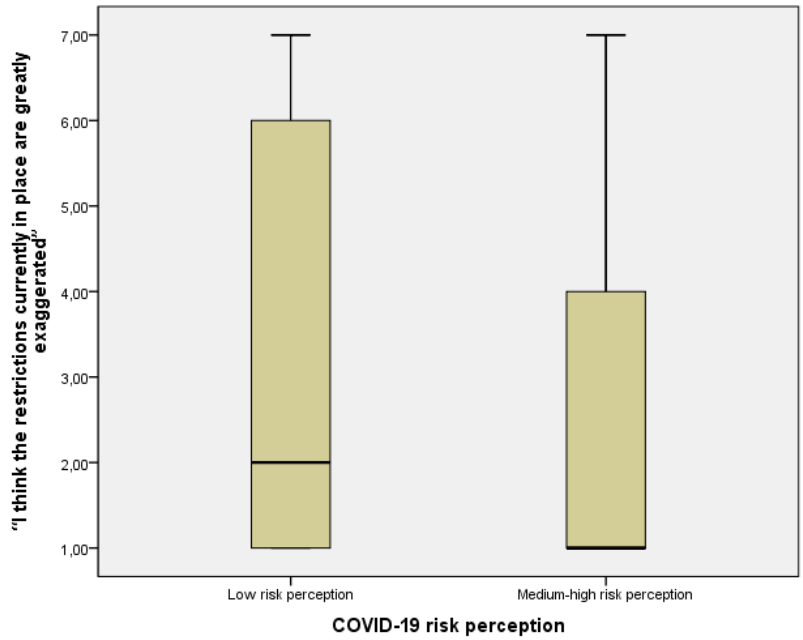


Figure 2. Scores from the analog scale for the proposition "I think the restrictions currently in place are greatly exaggerated" according to the COVID-19 risk perception levels.

4. Discussion

COVID-19 is an epidemic whose severity has been questioned globally since its early stages. This situation has led to the experiences such as not perceiving the risk it poses in an ideal way and not taking action on time. Assessing risk perception levels in communities is essential to implementing and organizing adequate and effective responses to combat the COVID-19 outbreak. In our study, it was aimed to determine the factors associated with low-risk perception levels.

Risk perception is a dynamic concept, and this was a unicenter study, so these factors could be considered the study's main limitations. In addition, religion and cultural characteristics could not be interpreted because they were not questioned. In a study conducted in Iran, it was reported that the factors most associated with the COVID-19 risk perception were religious/cultural characteristics besides emotional characteristics [10]. A different aspect of our study, which is evaluated positively, is the consideration of compliance to COVID-19 protective behaviors, actionism, and approach to policies together with the risk perception. In this way, the findings can be significant in providing feedback public health policymakers may need.

In the study, 26.3% of the participants were found to have low-risk perception, and this group remained in the minority. In the COSMO Turkey study, which was used in the study, a direct comparison cannot be made because the components evaluating the risk perception are handled separately. In the reports created with the data collected in July and August 2020 in the COSMO Turkey study, it was noted that the perception of low susceptibility to being infected with COVID-19, which is one of the most critical parameters, was seen in 30-40% of the study group [15]. In another study by Peres et al. (2020), the perception of risk was evaluated with separate parameters, where the perception of low susceptibility to infection is 19.1% in the general population, excluding healthcare workers, and 5.7% among healthcare professionals [16]. The comparisons between studies may have been affected by the data collection period. Since the data were collected when the second wave of the pandemic started fading, and a more favorable climate was created due to developments in vaccine research, it may have affected the comparisons with other studies. In addition, the fact that the study group consists of

employees with higher education in the public sector and that the risk perception is evaluated by scoring some parameters may also be effective in the differentiation of the scores between the studies.

Studies conducted in many different countries have revealed different results according to environmental and temporal effects. It is seen that risk perception levels are lower, especially in the first months of the pandemic. In a study conducted in Italy with 3.282 participants and two different temporal data sets (February and March 2020), higher risk perception was found in the second wave than in the first wave [17]. In the first week of the pandemic in the USA, Wise et al. (2020) reported that risk perception parameters are relatively high [8]. In the study by Kuang et al. (May 2020) in India, it was reported that those who perceived the risk of having COVID-19 disease as none (60.0%) or low (23.0%) constituted the majority [18].

A level of risk perception, together with the establishment of an environment of trust, can impact the adoption of measures to reduce COVID-19 cases. Trust in local government and the media helps reduce disease transmission. The effects of different types of trust are manifested, in whole or in part, through risk perception. In a study conducted in Switzerland, it was reported that people with high "social" trust perceived more risk compared to people with low social trust [19]. In our study, low trust in information sources/tools ranks first among the risk factors for low COVID-19 risk perception, increasing the low-risk perception by 2.37 times. Building trust in management and the media plays a vital role in risk management of the disease and ensuring that the disease is perceived correctly [20]. For this reason, it seems that those with low COVID-19 risk perception are more likely to agree that the restrictions being implemented are exaggerated and that they have negative attitudes towards basic policies in efforts to flatten the epidemic curve.

In the study, it was observed that the low level of COVID-19 risk perception was higher in those over the age of 40 (50.4%), and in further analysis, being 40 years old and over was found to be 1.76 times riskier for low-risk perception. In the report of the COSMO Turkey 2020 July 17th-31th study, it was revealed that the perceived probability of being infected with COVID-19 decreases as age increases [21]. Although some studies [15, 22] show that as the age of the participants increases, their perceived vulnerability to COVID-19 decreases, but the perceived severity increases; it has been shown that older adults generally have lower risk perception levels, and the risk perception of susceptibility to infection tends to decrease as age increases [14, 23, 25]. One of the reasons for this may be the decline in cognitive function of the elderly, further limiting their knowledge of the incidence of people affected by the virus due to the further reduction of their social networks during the COVID-19 shutdowns.

In the context of epidemics, risk perception is a parameter related to “higher self-reported compliance behavior” for preventive measures. Wise et al. (2020) found that risk perception level was associated with self-reported compliance in two basic protective behaviors of hand washing and social distancing [8]. In our study, per the studies in the literature [5-8], it was evaluated that those with a low level of risk perception related to COVID-19 had lower compliance with protective behaviors. In a further analysis, a low level of compliance with protective behaviors was determined as one of the critical risk factors for low-risk perception (OR; 95%CI: 1.75; 1.09-2.76).

In this study, no difference was found between men and women regarding COVID-19 risk perception levels. In some studies, it has been reported that being a woman is one of the factors indicating high-risk sensitivity [14, 25, 26]. In the first report of COSMO Turkey (2020 July 17th-31th), being female was not found to be associated with the possibility or suspicion of getting sick, in line with our study, but differently, it was found to be associated with disease severity which is a component of risk perception [21].

As the age increases, the level of risk perception may vary due to the recognition of COVID-19 infection in the immediate environment, whether a more severe disease is seen or not, and accordingly "availability error". [27]. Rosi et al. (2021) showed that the experience of experiencing COVID-19

infection among relatives, friends, or acquaintances is determinant in explaining the level of vulnerability to risk in all age groups, except those over the age of 70 [14]. Our study observed that the risk perceptions of those who were at risk of transmission were lower than those of those who did not have a risk of transmission, but in further analysis, no difference was found between these groups.

Among the information sources/tools related to COVID-19, the most trusted information sources were healthcare professionals (6 points) and press releases or statements of official institutions (5 points), respectively. Celebrities and social media influencers were the groups with the lowest confidence levels. In the first report of COSMO Turkey, press releases of official institutions (approximately 5 points) and television/radio (approximately 4 points) took place in the first place [21]. In the second report, websites/online news sites and family friends are the most trusted sources of information [15]. One of the important reasons for these differences may be the high education level of the study group.

Limitations and strengths of the study: This study had several limitations. The main limiting factor is the study's cross-sectional nature preventing the establishment of a cause and effect relationship. The other limitation is that risk perception is a dynamic concept and closely related to personal and environmental characteristics. Additionally, since this study employed an online questionnaire for data collection due to COVID-19 measures, the presented data can only represent those who can use a digital device and access the internet. These users are typically younger and from a higher socioeconomic background. The minimize the overrepresentation of this population in the study, the managers were instructed to help those in need by filling out the survey. One of the strengths of the study is that it is the first evaluation of a community unit in our country evaluated by making use of the COSMO study questions in accordance with its purpose. Moreover, since the risk perception levels of individuals are the focus of the study, this parameter has been addressed more comprehensively than the COSMO study questions.

5. Conclusion

A low level of risk perception was detected in one out of every four people in the study group. Age over 40, low level of trust in information sources/tools, and low level of compliance with COVID-19 measures pose a risk for low COVID-19 risk perception. People with a low perception of risk for the next wave of the disease may have a critical role, as they are less compliant with preventive measures. Since individuals' COVID-19 risk perception levels are related to many parameters in epidemic management, they should be monitored continuously using informative studies.

Conflict of Interest: The authors declare that they have no conflict of interest.

Ethical Approval: Ethical approval for this study was obtained from the Ethics Committee of the Eskisehir Osmangazi University (Number: E-25403353-050.99-121856, Date:12/14/2020)

Author's Contributions:

S.D., GK.: Conceptualization, Methodology, Resources, Analysis and/or Interpretation, Writing - Original draft preparation (30%)

S.M.: Conceptualization, Methodology, Resources, Analysis and/or Interpretation, Supervision, Writing - Original draft preparation (25%)

A.K.: Methodology, Resources, Analysis and/or Interpretation, Writing - Original draft preparation (15%)

S.S.: Methodology, Resources, Analysis, and/or Interpretation, - Writing Original draft preparation (15%)

A.U.: Analysis and/or Interpretation, Supervision, Critical Review - Original draft preparation (5%)

D.A.: Analysis and/or Interpretation, Supervision, Critical Review - Original draft preparation (5%)

M.F.O.: Supervision - Original draft preparation (5%)
All authors read and approved the final manuscript
Financial Disclosure: The authors declared that this study received no financial support.

References

[1] Ferrer, R.A., Klein, W.M., "Risk perceptions and health behavior", *Current Opinion in Psychology,* 5, 85-89, 2015.

[2] Cori, L., Bianchi, F., Cadum, E., Anthonj, C., "Risk perception and COVID-19", *International Journal of Environmental Research and Public Health,* 17(9), 3114, 2020.

[3] Barrios, J.M., Hochberg, Y., "Risk perception through the lens of politics in the time of the covid-19 pandemic", *NBER Report No.: 0898-2937,* University of Chicago, Becker Friedman Institute for Economics Working Paper, Chicago, USA, 2020.

[4] Zhong, Y., Liu, W., Lee, T.Y., Zhao, H., Ji, J., "Risk perception, knowledge, information sources and emotional states among COVID-19 patients in Wuhan, China", *Nursing Outlook,* 69(1), 13-21, 2021.

[5] Velikonja, N.K., Erjavec, K., Verdenik, I., Hussein, M., Velikonja, V.G., "Association between preventive behaviour and anxiety at the start of the COVID-19 pandemic in Slovenia", *Slovenian Journal of Public Health,* 60(1), 17-24, 2020.

[6] Ahorsu, D.I., Lin, C.Y., Timpka, T., Broström, A., Updegraff, JA., Arestedt, K., &Pakpour, A.H., "Associations between fear of COVID-19, mental health, and preventive behaviours across pregnant women and husbands: an actor-partner interdependence modeling", *International Journal of Mental Health and Addiction,* 20(1), 1-15, 2020.

[7] Yang, H., Bin, P., He, A., "Opinions from the epicenter: An online survey of university students in Wuhan amidst the COVID-19 outbreak1", *Journal of Chinese Governance,* 5(2), 234-248, 2020.

[8] Wise, T., Zbozinek, T.D., Michelini, G., Hagan, C.C., Mobbs, D., "Changes in risk perception and self-reported protective behaviour during the first week of the COVID-19 pandemic in the United States", *Royal Society Open Science,* 7(9), 200742, 2020.

[9] Goodwin, R.W.J., Tuicomepee, A., Suttiwan, P., Watakakosol, R., "Anxiety and public responses to covid-19: Early data from Thailand", *Journal of Psychiatric Research,* 129, 118-121, 2020.

[10] Samadipour, E., Ghardashi, F., Aghaei, N., "Evaluation of risk perception of Covid-19 disease: A community-based participatory study", *Disaster Medicine and Public Health Preparedness,* Cambridge University Press, 1-8, 2020. doi:10.1017/dmp.2020.311.

[11] Psycharchieves. (2020). *COVID-19 snapshot monitoring (COSMO)* [Online]. Available from: https://www.psycharchives.org/en/item/62216bdb-69fa-44e7-92b4-8438b3817341.

[12] Karadag, F., Aslan, S., Budakoglu, I., Kucukkarapinar, M., Yay, A., Ucar, O., "Turkey COVID-19 Snapshot MOnitoring (COSMO Turkey): Monitoring knowledge, risk perceptions, preventive behaviours, and public trust in the current coronavirus outbreak in Turkey", *PsychArchieves*, Preprint, 2020. https://doi.org/10.23668/psycharchives.3124

[13] World Health Organization (2021). COVID-19 Explorer. Country: Turkey, Doubling/Halving Time [Online]. Available: Available from: https://worldhealthorg.shinyapps.io/covid/

[14] Rosi, A., van Vugt, F.T., Lecce, S., Ceccato, I., Vallarino, M., Rapisarda, F., …&Cavallini, E., "Risk Perception in a Real-World Situation (COVID-19): How It Changes From 18 to 87 Years Old", *Frontiers in Psychology,* 12:646558,1-8, 2020. doi:10.3389/fpsyg.2021.64655

[15] Kucukkarapinar, M., Karadag, F., Aslan, S., Budakoglu, I., Ucar, O., Yay, A., Utku, T. "Turkish COVID-19 Snapshot Monitoring (COSMO) Wave-1,2,3 (17.07-31.07.2020; 01.08-15.08.2020; 16.08-31.08.2020)", *PsychArchives,* Preprint, 2020. https://doi.org/10.23668/psycharchives.4197

[16] Peres, D., Monteiro, J., Almeida, M., Ladeira, R., "Risk perception of COVID-19 among Portuguese healthcare professionals and the general population", *Journal of Hospital Infection,* 105(3), 434-437, 2020.

[17] Rubaltelli, E., Tedaldi, E., Orabona, N., Scrimin, S., "Environmental and psychological variables influencing reactions to the COVID-19 outbreak", *British Journal of Health Psychology,* 25(4), 1020-1038, 2020.

[18] Kuang, J., Ashraf, S., Das, U., Bicchieri, C., "Awareness, risk perception, and stress during the COVID-19 pandemic in communities of Tamil Nadu, India", *International Journal of Environmental Research and Public Health,* 17(19), 7177, 2020.

[19] Siegrist, M., Luchsinger, L., Bearth, A., "The Impact of trust and risk perception on the acceptance of measures to reduce COVID-19 cases", *Risk Analysis,* 41(5), 787-800, 2021.

[20] Ye, M., Lyu, Z., "Trust, risk perception, and COVID-19 infections: Evidence from multilevel analyses of combined original dataset in China", *Social Science and Medicine,* 265:113517, 2020.

[21] Kucukkarapinar, M., Karadag, F., Aslan, S., Budakoglu, I., Yay, A., Ucar, O., "Turkish COVID-19 Snapshot Monitoring (COSMO) Wave-1 (17.07-31.07.2020)", *PsychArchives,* Preprint, 2020. https://doi.org/10.23668/PSYCHARCHIVES.3457

[22] Kamran, A., Isazadehfar, K., Heydari, H., Azgomi, R.N.D., Naeim, M., "Risk perception and adherence to preventive behaviours related to the COVID-19 pandemic: a community-based study applying the health belief model", *BJPsych Open,* 7(4), 2021.

[23] Guastafierro, E., Toppo, C., Magnani, F.G., Romano, R., Facchini, C., Campioni, R., &Leonardi, M., "Older Adults' Risk Perception during the COVID-19 Pandemic in Lombardy Region of Italy: A Cross-sectional Survey", *Journal of Gerontological Social Work,* 64(6), 585-598, 2021. doi: 10.1007/s12062-021-09352-4.

[24] Pasion, R., Paiva, T.O., Fernandes, C., Barbosa, F., "The AGE effect on protective behaviors during the COVID-19 outbreak: sociodemographic, perceptions and psychological accounts", *Frontiers in Psychology,* 11:561785, 1-14, 2020. doi:10.3389/fpsyg.2020.561785.

[25] Dryhurst, S., Schneider, C.R., Kerr, J., Freeman, A.L., Recchia, G., Van Der Bles, A.M., …&van der Linden, S., "Risk perceptions of COVID-19 around the world", *Journal of Risk Research,* 23(7-8), 994-1006, 2020.

[26] Yıldırım, M., Güler, A., "Factor analysis of the COVID-19 Perceived Risk Scale: A preliminary study", *Death Studies,* 46(5),1065-1072, 2020.

[27] Tversky, A., Kahneman, D. Availability: a heuristic for judging frequency and probability, in Judgment under Uncertainty: Heuristics and Biases (Eds. D. Kahneman, P. Slovic, and A. Tversky), Cambridge University Press, Cambridge, pp. 163-189. 1982,

International Journal of Health Services Research and Policy

www.dergipark.org.tr/ijhsrp

IJHSRP

e-ISSN: 2602-3482

Review Article

SCIENTIFIC STUDIES ON THE EFFECTS OF THE CHANGES IN TREATMENT PROCESSES DURING THE COVID-19 PANDEMIC ON INFERTILE COUPLES: LITERATURE REVIEW

Yeter DURGUN OZAN*[1] ***Sümbül DİNÇER[2]***

[1] Department of Nursing, Atatürk Faculty of Health Sciences, Dicle University, Diyarbakır, Turkey
[2]Master's Degree Program on Women's Health and Diseases Nursing, Institute of Health Sciences, Dicle University, Diyarbakır, Turkey
*Corresponding author; yeter_ozan@hotmail.com

Abstract: *The COVID-19 pandemic has been rapidly raging. Suspending the services related to infertility and assisted reproductive techniques are among the measures taken to prevent the spread of the epidemic. Various guides and recommendations have been published by many national and international associations for this purpose. Recommendations foresee the completion of cycles that have already been initiated and require no new reproductive therapies to be initiated except for patients with a low ovarian reserve and those with a background of oncological disorders. The majority of couples whose treatment is suspended/postponed throughout this process have experienced intense stress, sadness, and anxiety. In addition, some of the patients do not have adequate coping skills. This article is designated as a literature review in order to provide information about the current emotional states of infertile couples throughout the COVID-19 pandemic and to guide the studies planned for their needs. Due to the fact that the subject is related to the pandemic, the years covered by the literature review were limited to 2019 and later. As a result of the literature review; 2 studies conducted in Turkey and 5 studies conducted abroad, examining the effects of COVID-19 on infertile couples, were included. The majority of studies revealed that suspending fertility treatments caused high levels of anxiety and stress in infertile couples. Providing psychological counseling services to couples through online platforms by health professionals is thought to enable couples to cope better with the situation.*

Keywords: *COVID-19, infertility, anxiety, stress, fertility treatment.*

Received: November 04, 2021 *Accepted: March 10, 2022*

1. Introduction

COVID-19 was initially reported in December 2019 in Wuhan (China); subsequently, the epidemic raged rapidly in other parts of the country. With the spread of the epidemic to other countries in a short time, COVID-19 disease was declared a pandemic by the World Health Organization (WHO) on March 11, 2020, when the first case was observed in Turkey [1,2]. A series of recommendations have been published on issues such as reorganizing hospital staff and resources as well as clinic and patient management in accordance with the need to take the necessary precautions to use the health system effectively during the COVID-19 pandemic. For this reason, associations and regulatory authorities operating on reproductive health have published guidelines based on expert suggestions and offered various recommendations in order to prevent a possible collapse in the health system during the pandemic. Organizations such as the European Society of Human Reproductive and Embryology

(ESHRE), the American Society of Reproductive Medicine (ASRM), The Fertility Society of Australia (FSA), and the Turkish Society of Reproductive Medicine (TSRM) suggested suspending the acceptance of new pregnancy cycles and to postpone the beginning of new treatment cycles except for the patients currently on their gestation cycle or requiring immediate fertility preservation due to ongoing cancer treatment. [3-7] In this context, the Ministry of Health of the Republic of Turkey decided to suspend new elective procedures and treatments in line with the recommendations of national and global health associations on the grounds of a circular published on March 17, 2020 [8]. Unexpected closures of fertility clinics both around the world and in Turkey have hindered the dreams of infertile couples to have a baby that they have been longing for years. Furthermore, the uncertainty about the pandemic outbreak may cause disappointment in these groups, who are already easily vulnerable and aggravate their anxiety and hopelessness about the success of the treatment process. This article is designated as a literature review in order to provide information about the current emotional states of infertile couples throughout the COVID-19 pandemic and to guide the studies planned for their needs.

2. Material and Method

Due to the fact that the subject is related to the pandemic, the years covered by the literature review were limited to 2019 and later. Electronic databases such as Pub-Med, Science Direct, Ebsco Host, Ovid, CINAHL have been scanned using the keywords 'covid-19, infertility, anxiety', 'covid-19, fertility treatment, postponement', 'covid-19, infertility, stress and coping'. The study included factors that negatively affect the emotional state of infertile couples whose fertility treatment was postponed, which were determined in the light of the studies examined, as well as related cross-sectional studies. As a result of the literature review; a total of 7 research studies, examining the effects of COVID-19 on infertile couples, were examined. 2 of these studies were conducted in Turkey while 5 of them were conducted abroad.

3. Results and Conclusion

The Covid-19 pandemic; which has already caused great stress all over the world and still has many unknowns, including its duration and health effects, is likely to have negative effects on infertile individuals who are among the vulnerable groups. Many studies have revealed that the closure of fertility clinics due to the pandemic creates intense stress, anxiety, and sadness in couples (Table 1). Ben- Kimhy et al. (2020) revealed in their study that patients whose treatments were suddenly suspended due to the Covid-19 pandemic felt very helpless, stressed, and lonely. In addition, it was determined that the stated stress level aggravated in relation to elderly ages and being alone. It has also been argued that patients with adequate social support systems are less affected by this process; hence it is necessary to strengthen these systems, which play an important protective role in times of crisis and help reduce distress levels. In addition, it has been stated that access to social support systems has become more challenging and may be associated with stress, with the force of the social distance applied during the pandemic period. Therefore, it has been suggested that online support groups may be an effective intervention to address the perceived need for socialization during periods of limited social interaction such as quarantine. In addition, it has been noted that encouraging patients to engage in activities such as doing exercise and healthy nutrition to optimize success after re-initiating treatments may provide patients a meaningful goal during quarantine. It has been argued that it is very important to communicate with patients during this period, which is defined as a psychologically distressing situation, and to provide psychosocial counseling when needed. It was stated that caregivers could use the data identified to identify the patients at higher risk of emotional distress and to adjust policies regarding the suspension of treatment in current and future events [9].

Barra et al. (2020) found that there was a significant increase in the stress, anxiety, and depression levels of couples whose treatment was either suspended or postponed due to the Covid-19 pandemic. It has been stated that these psychological outcomes are significantly more challenging in women over the age of 35 and who have attempted IVF before and that the occurrence of psychological symptoms is significantly related to the time exposure to news about Covid-19. In addition, other reasons for the increased incidence of psychological symptoms in women have been shown to be inadequate ovarian reserves, endometriosis, and uterine fibroids. The study further underlined that not only women but also men undergoing infertility treatment experience anxiety and stress and it was emphasized that the psychological consequences of suspending andrological services during quarantine should be taken into account. It was suggested that psychological counseling services should be strengthened in order to reduce psychological distress, improve the mental health and quality of life of patients who have applied to IVF centers throughout the Covid-19 outbreak. It was suggested that specific strategies could be developed for this purpose and these strategies could be notified to patients systematically during the treatment through various methods (i.e. brochures, websites, personal referrals) and via multiple providers (i.e psychologists, doctors, medical assistants, nurses) [10].

Esposito et al. (2020) have stated in their study that the existence of the current Covid-19 pandemic and the suspended ART programs thereto caused stress in infertile couples. It has been determined that the unknown effect of Covid-19 on the fetus causes anxiety in infertile couples. However, the majority of couples were found to be willing to continue ART programs despite the existing unknowns. In addition, while the percentage of uncertainty about pregnancy safety was found to be significantly higher in patients with a shorter infertility period, it was determined that patients with infertility for more than 1 year were more likely to take risks and resume the program to get pregnant. This issue may be included within the considerations of resumption of programs because many centers have already been prioritized for couples of elder maternal ages or couples who are close to the government-determined threshold for taking infertility ART services in terms of waiting lists. Infertile couples with individuals who were affected by Covid-19 in their family or environment had higher levels of anxiety compared to those who did not. It has further been determined that some infertile couples plan to give up ART programs due to the economic crisis caused by the pandemic. In general, it has been underlined that the psychological consequences of the Covid-19 pandemic on infertile patients should not be underestimated and specific psychological support should be planned [11].

The research studies conducted by Boivin et al. (2020) revealed that the closure of infertility clinics had adverse effects on patients which may be considered extreme, uncontrollable, and stressful. The current situation was perceived as a threat to the achievement of patients' goals of becoming parents. The majority of the patients were able to cope with the uncertainty of the situation by using various strategies (distraction, focusing on the positive aspects, adapting mentally and physically for subsequent treatments, strengthening their social networks, and staying up to date). On the other hand, it has been reported that 11,9% of women consider methods such as avoidance and denial and do not attain the necessary resources to cope effectively. It was further argued that being well informed about the psychosocial vulnerabilities of the patients related to infertility appeared to be important, particularly during the current crisis. Therefore, it has been emphasized that various strategies can be developed to monitor the weakened mental health associated with infertility treatment during the Covid-19 period. It was further suggested that the relevant authorities should work in collaboration and proactively manage the process to address the uncertainty arising from the pandemic outbreak. Moreover, it has been suggested that future psychological studies aiming to support patients' coping strategies should prioritize identifying patients at risk of distress with standard measures and develop digital technologies that are appropriate to the realities of fertility care in the context of Covid-19 [12].

Turocy et al. (2020) discussed in their study that 85% of the patients whose cycle was suspended find this situation moderate to extremely distressing, while 22% perceive this situation as equivalent to the loss of a baby. It was determined that the rate of patients not agreeing with the suspension of their cycles, in line with American Society for Reproductive Medicine (ASRM) recommendations was higher than the rate of agreement. In addition, the majority of the patients whose cycles were suspended stated that they wanted to resume their treatment in consultation with their doctor. It was stated that the majority of patients agreed with the opinion that diagnostic procedures such as hysterosalpingogram, hysteroscopy, and laparoscopy should be canceled. The study argued that patients' feedback on ASRM guidelines may be used to shape health policies to be developed for the pandemic period [13].

Tokgöz et al. (2020) revealed that the prevalence of state anxiety is higher in women whose ART cycles were delayed due to the Covid-19 outbreak. In addition, women with reduced ovarian reserve were found to have higher anxiety levels. It has been stated that women who believe that the possibility of not getting pregnant is more important than the risk of being infected with COVID-19 have a higher level of anxiety compared to women who have the opposite opinion. It has been suggested that support and intervention studies for infertile women should be focused on improving negative emotional factors [14].

Arbağ et al. (2021) discussed in their study that the vast majority of women who received infertility treatment felt helpless, sad, worried, and angry due to changes in their treatment programs, they experienced uncertainty and were tired of waiting. They also stated that the stress experienced by women due to infertility problems is much higher than the fear of being infected with COVID-19. The majority of women also stated that their spouses supported the suspension of their treatment during the pandemic outbreak. Some women stated that they did not agree with their husbands on this issue. For this reason, it has been argued that the level of anxiety and stress experienced due to the suspension of infertility treatment is higher in women compared to men. In addition, some women did not find the decision to postpone the treatment reasonable and asserted that this was applied to protect the health personnel from infection. Therefore, women experienced feelings of anger, distrust, and threat toward health officials. On the other hand; it has been stated that there are female patients who feel themselves safe, hence welcoming the suspension of the treatments due to the uncertainty of the pandemic and its potential adverse effects on both the pregnancy and the baby. It has been determined that the psychological changes experienced by women suffering from infertility problems due to the pandemic cause a decrease in their self-esteem and aggravate negative changes in their body images. The women stated that they would resume their treatment despite the financial difficulties experienced due to the pandemic. The women in question said that they resorted to coping methods such as praying, exercising, distracting, meditating, and drawing attention to the positive aspects of the suspension of infertility treatment during the pandemic process. On the other hand, it was determined that non-functional coping methods (crying, rebelling, blaming health authorities) also resorted among women with insufficient coping resources. For this reason, the importance of evaluating women's coping methods and empowering women who are inadequate in this regard was emphasized. According to these evaluations, it was stated that nurses may be assigned to support patients on various issues through online platforms. In addition, it was suggested that online peer support programs aiming to strengthen social support could be implemented and women's coping skills could be improved by organizing training to develop effective coping strategies [15].

Table 1. Summary of prior studies on the effects of Covid-19 on infertile couples

Item No	Author(s)	Publishing Journal	Title-Purpose of the Article	Method	Results
1	Ben-Kimhy et al. 2020	Human Reproduction	Title: Fertility patients under COVID-19: Attitudes, Perceptions, and Psychological Reactions Purpose: To examine the factors associated with the perceptions, attitudes, and psychological distress of infertile patients whose treatment was suspended during the Covid-19 process.	Place of Research: Israel Type of Research: Cross-sectional Study/online survey n:168	* Despite the decision executed by the Ministry of Health, 72% of the patients reported during the survey that they wanted to resume their treatment. * The patients stated that they felt very helpless, stressed, and lonely. * It was stated that elder age and being alone were associated with higher levels of distress and stress for patients. * It has also been argued that patients with adequate social support systems are less affected by this process.
2	Barra et al.2020	Journal of Psychosomatic Obstetrics & Gynecology	Title: Psychological status of infertile patients who had in vitro fertilization treatment interrupted or postponed due to COVID-19 pandemic: a cross-sectional study. Purpose: To investigate the psychological state of infertile women and men whose in vitro fertilization (IVF) treatment was interrupted or postponed due to the Covid-19 emergency.	Place of Research: Italy/ Genoa Type of Research: Cross-sectional Study/online survey n:524	* The prevalence of feelings of anxiety and/or depression was found to be significantly higher, especially in women older than 35 years of age and who had previously attempted IVF. * The occurrence of psychological symptoms is found to be significantly related to the time of exposure to news about Covid-19. * It has been determined that women with low ovarian reserves, suffering endometriosis and uterine fibroids more frequently indicate psychological symptoms. * Women with infertility factors are found to exhibit higher anxiety and/or depression status compared to those without; similarly, it was found that male patients with infertility factors are more likely to exhibit anxiety and/or depression frequently compared to those without. * While 196 individuals participating in the study stated that they wanted to resume IVF treatment despite the Covid-19 pandemic, 401 individuals stated that the opportunity to know when they could resume their IVF treatment would make them feel safer.

Table 1 continued.

Item No	Author(s)	Publishing Journal	Title-Purpose of the Article	Method	Results
3	Esposito et al. 2020	European Journal of Obstetrics & Gynecology and Reproductive Biology	Title: Influence of COVID-19 pandemic on the psychological status of infertile couples Purpose: To evaluate the impact of the Covid-19 pandemic on the emotions, concerns, and future plans of infertile couples.	Place of Research: Italy Type of Research: Online survey n: 627	* The Covid-19 pandemic and subsequent suspension of ART programs have led to increased stress levels in infertile couples. * The uncertainty of the effect of Covid-19 on the fetus is found out to aggravate the level of anxiety in couples. Despite this, 64.6% of the participants stated that they wanted ART programs to be resumed. * It has further been determined that 11,5% of the infertile couples plan to give up ART programs due to the economic crisis caused by the pandemic. * Couples with at least one relative affected by the Covid-19 outbreak have been found to experience higher levels of anxiety compared to unaffected families.
4	Boivin et al. 2020	Human Reproduction	Title: Patient experiences of fertility clinic closure during the COVID-19 pandemic: appraisals, coping, and emotions Purpose: To evaluate the reactions of patients towards the closure of infertility clinics due to Covid-19; to examine coping strategies and emotional responses.	Place of Research: United Kingdom Type of Research: Mixed Method/Cross-Sectional Study n: 450	* Almost all patients reported stress, anxiety, and frustration about the situation; while others expressed that they felt anger and resentment towards the injustice of the situation. * It was stated that the closure of infertility clinics had a negative effect on the lives of the patients rather than a positive one. * The uncertainty created by the situation was perceived by the patients as a threat to the achievement of the goal of having a baby. * Majority of the patients were able to cope with the uncertainty of the situation by using various strategies (distraction, focusing on the positive aspects, adapting mentally and physically for subsequent treatments, strengthening their social networks, and staying up to date).

Table 1 continued.

Item No	Author(s)	Publishing Journal	Title-Purpose of the Article	Method	Results
5	Turocy et al.2020	Fertility and Sterility	Title: The Emotional Impact of the ASRM Guidelines on Fertility Patients During the COVID-19 Pandemic Purpose: To investigate the opinions of patients undergoing fertility treatment during the COVID-19 pandemic about ASRM recommendations and the emotional effects these recommendations have had on patients.	Place of Research: United States Type of Research: Online survey n: 518	* 85% of patients whose cycle was canceled reported that they found this situation moderate to extremely distressing. * As a matter of fact some reported that they perceive this situation as equivalent to the loss of a baby. * It was determined that the rate of patients not agreeing with the suspension of their cycles, in line with American Society for Reproductive Medicine (ASRM) recommendations was higher than the rate of agreement. * Majority of the patients whose cycles were suspended stated that they wanted to resume their treatment in consultation with their doctor.
6	Tokgoz, Kaya, Tekin. 2020	Journal of Psychosomatic Obstetrics & Gynecology	Title: The level of anxiety in infertile women whose ART cycles are postponed due to the COVID-19 outbreak Purpose: To evaluate the level of fear and anxiety about the Covid-19 outbreak in infertile women whose ART cycles were delayed due to the pandemic.	Place of Research: Turkey Type of Research: Cross-sectional Study/online survey n: 101	* The level of state anxiety was found to be higher in women whose treatments were delayed due to the epidemic. * The decrease in ovarian reserves was found to significantly affect anxiety levels. * It has been concluded that worrying about not being able to have children causes higher levels of anxiety than being infected with the coronavirus.

Table 1 continued.

Item No	Author(s)	Publishing Journal	Title-Purpose of the Article	Method	Results
7	Arbağ, Aluş Tokat, Fata. 2021	ESHRE's 37th virtual Annual Meeting 2021	Title: Emotions, Thoughts, and Coping Strategies of Women with Infertility Problems on Changes in Treatment during Covid-19 Pandemic: A Qualitative Study Purpose: Using Folkman's Transactional Stress and Coping Model to evaluate the feelings, thoughts, and coping strategies of women patients suffering infertility regarding treatment changes throughout the Covid-19 pandemic.	Place of Research: Turkey Type of Research: Qualitative Study n: 30	* Some women perceived the changes in treatment programs positively and stated that suspending the treatment made them feel safer due to the uncertainty created by the pandemic and the yet unpredictable effects of the virus on the pregnancy process and the baby. * Majority of the women evaluated that the closure of their clinics had a negative impact on their lives. * They reported that they experienced hopelessness, uncertainty, disappointment, anxiety, anger, sadness, and exhaustion during this process. * Women perceived changes in infertility treatments as a stronger stressor than coronavirus. * In addition, some women did not find the decision to postpone the treatment reasonable and asserted that this was applied to protect the health personnel from infection. * Women experienced feelings of anger, distrust, and threat towards health officials. * Moreover, women stated that they had to stay at home all the time throughout the pandemic, they had to stay away from their friends and families, therefore they did not need self-care hence saw themselves as uglier. * The women stated that they would resume their treatment despite the financial difficulties experienced due to the pandemic. * The women in question said that they resorted to coping methods such as praying, exercising, distracting, meditating, and drawing attention to the positive aspects of the suspension of infertility treatment during the pandemic process.

Funding: This study did not receive any specific grant from funding agencies in the public, commercial or not-for-profit sectors.

Conflicts of interest: None.

The Declaration of Ethics Committee Approval

The author declares that this document does not require an ethics committee approval or any special permission. Our study does not cause any harm to the environment.

Compliance with Research and Publication Ethics: This work was carried out by obeying research and ethics rules.

Authors' Contributions:

YDO: reviewed literature, wrote, and revised the manuscript. SD: provided assistance and reviewed and revised the manuscript.

References

[1] World Health Organization(2020, March 11). *WHO Director-General's opening remarks at the media briefing on COVID-19* [Online]. Avaliable: ,https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-

[2] Ministry of Health (2022). *COVID-19 Information Page* [Online]. Avaliable: https://covid19.saglik.gov.tr/TR-66935/genel-koronavirus-tablosu.html

[3] Ministry of Health (2020). *Guidelines for Working in Health Institutions and Infection Control Measures in the COVID-19 Pandemic, Scientific Advisory Board Study, 127–132* [Online]. Avaliable: https://covid19.saglik.gov.tr/TR- 66532/saglik-kurumlarinda-calisma-rehberi-ve-enfeksiyon-kontrol-onlemleri.html

[4] Europian Society of Human Reproduction and Embryology (ESHRE)(2020). *Guidance on recommencing ART treatments* [Online]. Avaliable: https://www.eshre.eu/COVID19WG

[5] American Society for Reproductive Medicine (ASRM) (2020). *Patient management and clinical recommendations during the coronavirus (COVOD-19) pandemic* [Online]. Avaliable: https://www.asrm.org/globalassets/asrm/asrm-content/news-and-publications/covid- 19/covidtaskforce.pdf

[6] The Fertility Society of Australia (FSA) (2020). *Updated Statement of the COVID-19 FSA Response Committee* [Online]. Avaliable: https://www.virtushealth.com.au/sites/vh/files/2020-03/20200324-covid-19-statement-fsa- response-committee.pdf

[7] Turkish Reproductive Health and Infertility Association (TSRM) (2020). *Post-COVID-19 Restart Recommendations* [Online]. Avaliable: https://www.tsrm.org.tr/pro/tsrm-egitim/bilgilendirme/tsrm-covid-19-sonrasi-yeniden-baslangic-onerileri-el-kitabi

[8] Ministry of Health (2020*). Elektif İşlemlerin Ertelenmesi ve Diğer Alınacak Tedbirler* [Online]. Avaliable: https://shgmhastahakdb.saglik.gov.tr/Eklenti/36865/0/elektif-islemlerin-ertelenmesi-ve-diger-tedbirlerpdf.pdf (Accessed 31.10.2021).

[9] Ben-Kimhy, R., Youngster, M., Medina-artom, T. R., Avraham, S., Gat, I., Marom Haham, L., & Kedem, A., "Fertility Patients Under COVID-19: Attitudes, Perceptions And Psychological Reactions", *Human Reproduction*, *35*(12), 2774-2783, 2020. Doi: 10.1093/humrep/deaa248

[10] Barra, F., La Rosa, V. L., Vitale, S. G., Commodari, E., Altieri, M., Scala, C., & Ferrero, S., "Psychological status of infertile patients who had in vitro fertilization treatment interrupted or

postponed due to COVID-19 pandemic: a cross-sectional study", *Journal of Psychosomatic Obstetrics & Gynecology*, 30, 1-8, 2020. Doi: 10.1080/0167482X.2020.1853095.

[11] Esposito, V., Rania, E., Lico, D., Pedri, S., Fiorenza, A., Strati, M. F., ... & Venturella, R., "Influence Of COVID-19 Pandemic On The Psychological Status Of İnfertile Couples", European *Journal Of Obstetrics & Gynecology And Reproductive Biology*, *253*, 148-153, 2020. Doi: 10.1016/j.ejogrb.2020.08.025.

[12] Boivin, J., Harrison, C., Mathur, R., Burns, G., Pericleous-Smith, A., & Gameiro, S., "Patient experiences of fertility clinic closure during the COVID-19 pandemic: appraisals, coping and emotions", *Human Reproduction*, *35*(11), 2556-2566, 2020. Doi: 10.1093/humrep/deaa218

[13] Turocy, J.M., Robles, A., Hercz, D., D'Alton, M., Forman, E.J., Williams, Z., "The Emotional Impact of The ASRM Guidelines on Fertility Patients During The COVID-19 Pandemic", *Fertility and Sterility*, 114(3), e63, 2020. Doi: 10.1016/j.fertnstert.2020.08.194

[14] Tokgoz, V.Y., Kaya, Y., Tekin, A.B., "The level of anxiety in infertile women whose ART cycles are postponed due to the COVID-19 outbreak", *Journal of Psychosomatic Obstetrics & Gynecology*, 19, 1-8, 2020. Doi: 10.1080/0167482X.2020.1806819

[15] Arbag, E., Tokat, M.A., Fata, S., "Emotions, Thoughts, and Coping Strategies of Women with Infertility Problems on Changes in Treatment during Covid-19 Pandemic: A Qualitative Stud.". *Abstracts of the 37th Annual Meeting of the ESHRE, 26 June to 1 July 2021*, Vol 36, Sup1, 2021, pp.i88-i89. Avaliable: https://www.eshre.eu/Annual-Meeting/Eshre%202021