International Journal of Health Services Research and Policy

IJHSRP

e-ISSN:
2602-3482

VOLUME 5
ISSUE 2

AUGUST
2020

Publisher
International Engineering Science and Education Group

INESEG

Publisher of Journal: *Rojan GÜMÜŞ*

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e-ISSN: 2602-3482

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CONTENTS

Research Articles

Review Articles

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e-ISSN: 2602-3482

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Research Article

HEALTH WORKER AND CAREGIVER INTERACTION DURING CHILD VACCINATION SESSIONS AT HEALTH FACILITIES IN SOMALI REGION OF ETHIOPIA: A QUALITATIVE STUDY

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Abstract: *Somali Region is one of the largest regions in Ethiopia which has performed persistently low with immunization coverage. Communication during vaccination sessions at health facilities is a key factors that influence caregiver's decision to bring back their children for vaccination. The objective of this study was to assess health worker and caregiver interaction during immunization sessions and identify communication gaps at health facilities in the Somali region. This was a cross-sectional qualitative study. The study was carried out using in-depth interviews with health workers responsible for vaccination, observation of vaccinator and caregiver interaction during immunization sessions, and exit interview of caregivers who brought their children for vaccination or whose child was vaccinated at the health facility. Health workers responsible for vaccination in twelve health facilities from the central and remote parts of the region were interviewed. A total of 63 vaccination sessions in the 12 health facilities were observed and caregivers were interviewed on exit. Most caregivers described the vaccinators as friendly and supportive. Some mothers who did not bring the immunization card with them were returned without the child getting the service. The return date for vaccination was written on child immunization card in most cases. Most caregivers do not identify vaccines by name or purpose, however, they all want their children to get vaccines as recommended by health workers. Health workers do not communicate all information required for continued use of immunization services at health facilities during vaccination sessions. In the Somali region, caregiver communication will need to be improved through training of health workers on immunization basics and effective communication skills.*
Keywords: *vaccination, health worker, communication, Ethiopia*

Received: December 31, 2019 Accepted: June 02, 2020

1. Introduction

Globally two to three million children die of vaccine-preventable diseases annually [1]. Immunization remains a reliable high impact strategy to decrease deaths from vaccine-preventable diseases and a key strategy to attain sustainable development goal 3 that aims to decrease mortality in under-fives to 25/1000 life births by 2030 [2-4]. Immunization has enabled disease eradication and elimination and substantial gain in improved child survival [5].

The national immunization program in Ethiopia includes BCG and Polio vaccine given at birth,

the DPT-HepB- HiB (Pentavalent vaccine) OPV, PCV vaccines given at age 6, 10, and 14 weeks. Measles containing vaccine given at 9 months and repeated after 6 months, Rota vaccine is given at age 6 and 10 weeks while IPV is given at age 14 weeks. The HPV vaccine was introduced in 2019 and is given to girls at 14 years of age [6].

The Ethiopian Demographic Health Survey (EDHS) has shown consistent improvement in national EPI coverage over the past years from 18% in 2000 to 39% in 2016. The current highest vaccine coverage is in Addis Ababa (89%) and the lowest in the Somali region (19%) [7].

The Somali region located in the east southeastern part of Ethiopia is one of the regions that has persistently performed low with routine immunization coverage. In 2018 the region administrative data for Penta 3 coverage was 71% and measles coverage 67%, way below the national target of 90%. The dropout rate from Penta 1 to Penta 3 was 15.6%, which is above the highest acceptable level of 10%. [8].

Communication is one of many interacting factors that influence parents' and other caregivers' decisions to take their children for vaccination. Communication alone cannot address all aspects of vaccine hesitancy or refusal. However, communication interventions are an important component of vaccination and inadequate communication can hurt vaccination uptake, vaccine completion, and parental trust in a vaccination program (9). In most settings, communication about childhood vaccination is common, but there is uncertainty around how people perceive and understand communication from health workers at health facilities during vaccination sessions and whether and how this influences their decision to vaccinate. Understanding and improving health worker/caregiver interactions can lead to health workers' gaining more satisfaction from their vaccination work and caregivers feeling more satisfied and better informed, and more children being fully vaccinated and protected (9-10) Health worker and caregiver communication during vaccination sessions is one of the important factors, along with health worker's knowledge, attitude and practice that determine successful immunization service uptake. A Study evaluating health worker and caregiver interaction at health facilities during vaccination session and gaps in communication to our knowledge is nonexistent

The objective of this study was, therefore to assess health worker and caregiver interaction during vaccination sessions at health facilities in the Somali region and to identify gaps in communication that contribute to low completion of immunization.

2. Material and Methods

2.1. Study site

The study was conducted in the Somali Region of Ethiopia. The region has a population of 6 million with a majority (85%) moving or pastoralist population. The region has 1 central hospital, 3 general hospitals, 9 primary hospitals 216 health centers, and 1311 health posts. The Somali Region is subdivided into eleven administrative zones, which are subdivided into 93 districts (Woredas) and six town administrations, and further subdivided into sub-districts (Kebele), which are the lowest administrative unit [11].

Study design:

The study used a qualitative cross-sectional method. In-depth interview of health workers at health facilities and exit interview of caregivers after vaccination session was conducted using a semi-structured questionnaire. All vaccination sessions on the day of the visit were observed.

2.2. Respondent sample

Three districts in the region, geographically representing central and remote areas were selected purposively. In the district, health facilities were listed and a health center and a health post were selected randomly. At each health facility, an in-depth interview of health workers responsible for vaccination, observation of vaccinator and caregiver interaction during immunization session, and exit interview of caregiver after the vaccination session was done.

2.3. Assessment of health worker and caregiver interaction

In-depth interviews, using in-depth interview guides, on health workers' general levels of motivation regarding their immunization responsibilities, vaccine and vaccination knowledge, service delivery, communication with caregivers, and collaboration with community volunteers to pass on immunization messages was conducted. Data collectors were selected based on their knowledge of the local language and previous experience in qualitative research. All data collectors were trained on the study tools. A team consisting of an interviewer and a note-taker conducted an in-depth interview with health workers. Interview proceedings were recorded.

Health worker and caregiver interaction during immunization sessions in each health facility were documented through observation. After observation, an exit interview of caregivers whose child received vaccination at the health facility was conducted. Interview guides for an exit interview and a checklist for observation of vaccination sessions were used. During observation and exit interview, caregivers waiting time at a health facility, their experience of the vaccination session, caregiver's knowledge of the return date and possible side effects, use of immunization card, and caregiver's experience with the health worker during the vaccination session were assessed.

2.4. Data management

Findings from in-depth interview audio recordings were transcribed into Microsoft word 2010 by the data collectors who were fluent in the local language and English. After transcription, the transcribed document was reviewed by investigators and compared to note taken in the field for accuracy. The investigators coded the transcripts utilizing focused coding based on the objectives of the study. The codes were then entered into qualitative analysis software ATLAS.ti 8 by topic to explore both anticipated and emergent themes using a thematic analysis technique.

Ethical considerations

The Somali region health bureau ethical committee reviewed and approved the study. Ethical clearance for the study was obtained from the ethics committee of the Somali region health bureau. (Certificate permit number, SRHB/18/2000-2005 on 20/6/19). Informed consent was obtained from each participant for the in-depth interview, observation, and exit interview. The observation was conducted after obtaining informed consent both from the health worker and caregiver.

3. Results and Discussion

The qualitative study was conducted in the Somali region between 20-26 July 2019. The study enrolled and analyzed in-depth interviews from health workers in twelve selected health facilities in six districts. Most of the vaccinators at health centers were nurses while health extension workers provided vaccination service at health posts (Table 1).

Table 1. In-Depth Interviews: Details of health workers interviewed

Zone	Facility	Profession	Sex	Year of service	Main task	Other tasks
Siti	Error HC	Nurse	F	6	Vaccinator	MCH/Family planning
	Kanteras Health Post	Nurse	F	5	Vaccinator	The Health extension package
	Hurso Health center	Nurse	M	3	Epi focal person	Cold Chain and Vaccine management
	Halisho Health Post	Nurse	F	5	Health extension worker	Health extension package
Liban	Aynle health Center	Nurse	F	5	vaccinator	MCH/Family Planning
	Hysuftu Health center	Nurse	M	5	Epi Focal person	Health extension package
	Mesjidi Health post	Nurse	F	5	Epi Focal person	HEW supervisor
	Dheka Suftu Health Post	HEW	M	1	Vaccinator	Health extension package
Shebele	Adade health center	Nurse	F	4	Epi Focal person	MCH/Family planning
	Adade Health Post	HEW	M	9	Vaccinator	Health extension package
	Kelafo health center	Nurse	F	9	Epi Focal Person	MCH/Family Planning
	Hillobad Health Post	HEW	F	1	Vaccinator	Health Extension package

A total of 63 vaccination sessions in twelve health facilities were observed, and caretakers with a child vaccinated at health facility were interviewed on exit. All of the caretakers who brought a child to health facility were mothers and the majority were in the age group 25-34 years (52%, 33/63) and most can not read and write (54% 34/63) (Table 2).

Table 2. Profile of Caregivers Who Brought Child to Health Facility for Vaccination

Caregiver	Age			Relation to child		Language		Read and Write	
	15-24	25-35	36-49	Mother	Other	Somali	Other	Yes	No
Number	29	33	1	63	0	62	1	29	34
Percentage (%)	46	52	2	100	0	98	2	46	54

3.1. Findings from the in-depth interview

The main themes that emerged surrounding health worker's motivation and practice were health workers job satisfaction, knowledge on vaccine and vaccine contraindication, vaccination card usage, challenges in service delivery, and collaboration with community volunteers.

Despite working in difficult circumstances, with insufficient support and compensation and supply of vaccine or other essential commodities there was a high level of motivation from health workers providing immunization.

All vaccinators at the health facilities were happy on the work they do to get children vaccinated as the respondents below said:

“I enjoy vaccinating children and there are no aspects of the immunization work I do that I do not like” (Health extension worker, at Dekasuftu health post).

The decision by vaccinator when caregivers forget to bring the immunization card with them is mixed. Some tell the caregivers to go back and bring the card, especially if the residence is nearby, and do not give the vaccine to the child. Others advise them to bring for the next visit and give the vaccine to the child after checking the child's records on the immunization registration book at the facility.

All vaccinators responded that for those caregivers who bring immunization cards with them they give vaccines to the child even if the due date the child was supposed to get the vaccine has passed. "When caregiver brings child late for vaccination, I do not have a bad feeling towards the caretaker, I ask the caretaker the reason for not coming on the date of appointment, then check the vaccination card and advise them that vaccine should be taken on the date specified and not to be late again and give the vaccine required to the child" (EPI focal person and vaccinator: Hurso health center).

"When mothers forget to bring the immunization card, I send them back to bring the card, it is very difficult for me to give service to a child without an immunization card." (Epi focal person and vaccinator: Adade Health Center, Shebele Zone).

Most health workers mentioned that children aged one year and below are target groups for routine immunization and provide the certificate of completion to children who completed the primary series at 9 months of age. At the time they provide the certificate of completion however, they tell caregivers to bring their child at 15 months of age for the MCV2 vaccine.

A sick child is commonly mentioned by the health worker as a contraindication for vaccine. However, there was a lack of clarity on the degree of sickness that should be a contraindication to give a vaccine. Most health workers know that a child might develop fever and pain at the injection site however, this information is not regularly passed on to caregivers.

All mentioned that their facilities conduct vaccination sessions only twice weekly at health centers and weekly at health posts, and in all facilities, BCG and Measles vaccines are given monthly. Health workers mentioned that the vaccination session schedule is based on caregivers' convenience, shortage of BCG and measles vaccine, and facility decision to offer these vaccines on fewer days to avoid vaccine wastage. All health centers conduct outreach sessions; however, outreach sessions are not conducted regularly due to a shortage of transport services. Some felt that their facilities do not have adequate staff and most of the health centers and all health posts involve community volunteers in their activities and consider their contribution as the most important single factor for a successful vaccination program.

3.2. Findings from Observation of vaccination sessions

Most caregivers (87% 120/138) brought immunization card with them when they visited health centers than those visiting health posts (57%, 79/138). Vaccinators in the majority of the health facilities mentioned the return date and its importance to caregivers. However, there was inadequate documentation of the return date and vaccine given on immunization cards. Most children visiting health centers received all the vaccine they required than those at health posts (Figure 1).

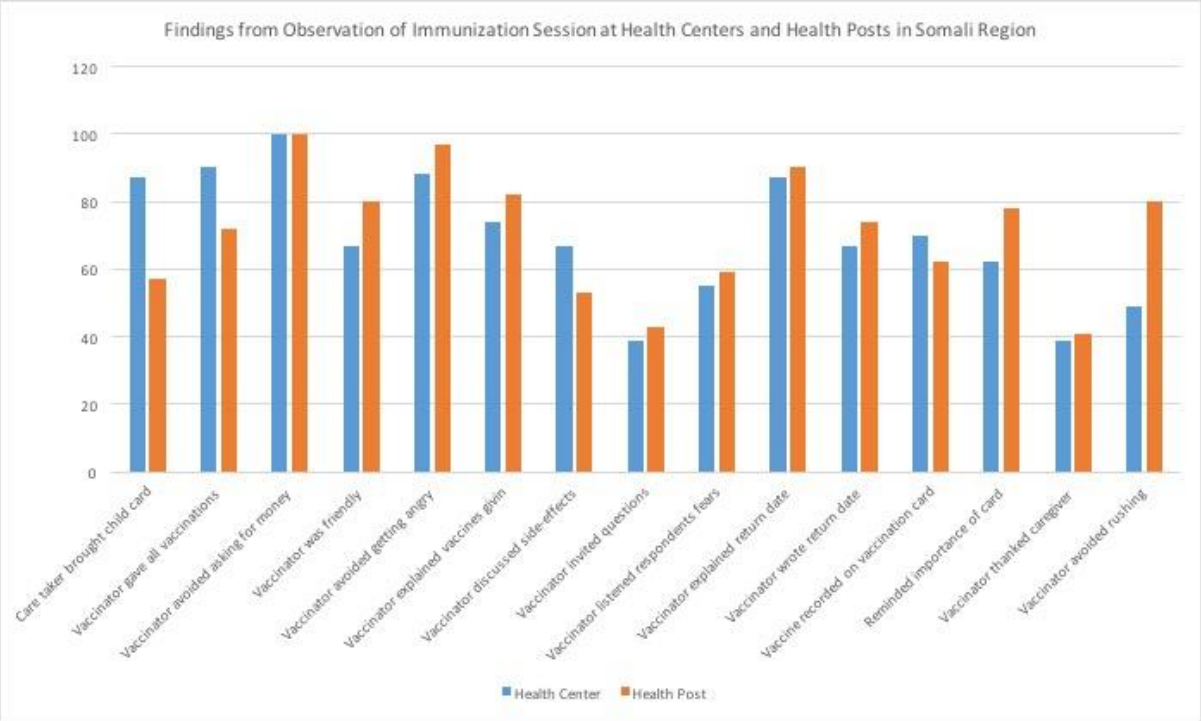

Figure 1.Finding from observation of immunization session at health centers and health posts in the Somali region

3.3. Findings from Exit Interview

The average time that a caregiver stays at the health facility for the child to be vaccinated is higher at health posts (average 20.8 minutes, range 15-35 minutes) than at health centers, (average 11.6 minutes, range 10-15minutes), (Figure 2). All caregivers praised health workers' treatment during the service. Caregivers identify the vaccine given to the child by the site of injection and route of administration and not by name and purpose. They consider vaccines to be important to prevent illness. Most caregivers brought the immunization card with them however, only 67% of the cards at health centers and 74% at the health posts had a return date written. Most caregivers correctly mentioned the return date as told by the health worker, some did not. Most caretakers responded that fever and pain at the injection site are possible expected side effects and mentioned this is from their previous experience and not because it was told by the health worker.

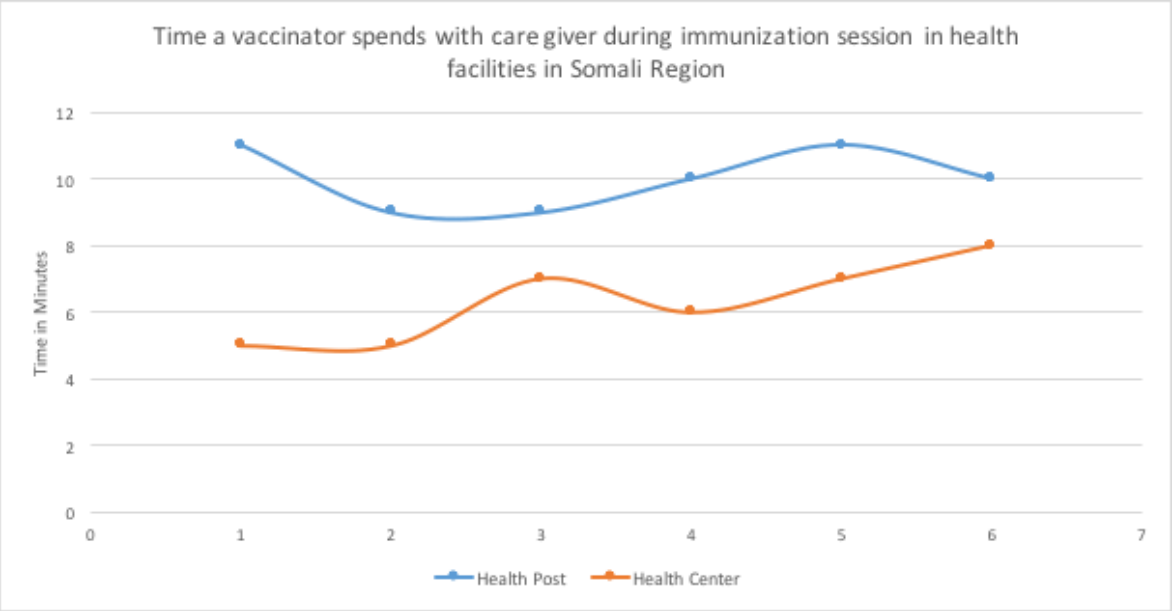

Figure 2. Time vaccinator spends with the caregiver during immunization session in Somali region

4. Discussion

In this cross-sectional study, we found that the quality of interaction between the health worker and caregiver during immunization sessions at health centers and health posts in the Somali region is affected by the following factors.

There is a high level of illiteracy among caregivers who brought children for vaccination. Caregivers who can not read will not comprehend what is written, and the purpose and importance of the child vaccination card. Consequently, some caregivers do not bring the child vaccination card with them, and some vaccinators do not give service and return back the caregiver to bring the card. This could be avoided if the contents and purpose of the immunization card are clearly and regularly communicated with caregivers and advised to bring with them when they visit the health facility.

Health workers in the Somali region are characterized as friendly by caregivers and avoided getting angry when there was a reason to be. This is a very positive and encouraging finding and departure from finding of other studies [12-16] that suggested health worker's attitude was a major hindrance to caregiver uptake of immunization services. A bad experience may affect caregiver willingness to vaccinate subsequent children and caregivers may discuss their negative experience with others in the community. This is also reflected in Demographic and Health Survey data that shows higher birth order children tend to receive fewer vaccinations [8].

Return date is not written on vaccination card in some cases and vaccinators verbally communicate the return date without confirmation that it is understood. In the majority of times, the caregiver forgets because the information was not captured or the caregiver expects the information on the return date to be told again sometime in the future. This finding is in agreement with the previous study done in Wonago, Ethiopia [17].

Caregivers did not know the specific vaccine that was administered to their child, this is because they could not read the name of the vaccine given from the vaccination card, however, this does not

seem to be a factor in vaccine uptake as most caregivers believe that vaccination is good for their child. Similar findings were seen from studies in the Gambia [18] and Rwanda [19].

The time that the vaccinator interacts with the caregiver is brief, especially at health centers. This will have an impact on the scope and depth of information shared with the caregiver
Vaccinators do not often communicate the side effects of the vaccine the child received although most caregivers mentioned that they know fever and pain at the injection site are expected after vaccination. A caregiver who does not have previous experience could be alarmed if side effects that the health worker failed to mention occur and could be a reason to keep a child away from vaccination [20].

The MCV2 is now added to the routine immunization schedule to be given 6 months after MCV1 which is given at age 9 months. Therefore, the certificate of completion of the basic vaccination should be given after children receive the MCV2 and not at 9 months as seen in some health facilities.
Contraindication for giving a vaccine in some facilities includes any sick child, this could be because of fear that health workers might be blamed if an illness gets worse after vaccination [21].

All vaccines are not available all day at health facilities. Notably BCG and MCV vaccine. The BCG and MCV vaccine are often provided monthly which requires the caregivers to come back on a separate schedule to get the service. In situations where the return on the specific date is not possible this will result in the child missing the vaccines.

Community volunteers contribute hugely to the success of immunization programs. The health facilities collaborate with the community volunteers to pass on immunization messages to the community, trace defaulters and pregnant mothers and notify newborns for vaccination. Involving community volunteers in vaccination programs has been documented as an important aspect of the success of immunization programs.

5. Conclusion

The study triangulated findings from in-depth interviews, observations, and exit interviews. The findings were found to be consistent irrespective of the method used. During the immunization session, health workers do not communicate all messages required for continued use of immunization services by the caretaker at health facilities. Caregiver interaction in the Somali region will need to be improved through training of health workers on the basics of immunization and Interpersonal communication (IPC). To standardize expectations and performance at health facilities there is a need to develop standard communication competency guides.

Acknowledgments

We are thankful to the health workers and caregivers who took their time to participate in the in-depth and exit interviews. We also thank the data collectors, the Somali Region Health Bureau, all study area health facility heads, and the CGPP admin and Finance team, who made this study possible. This study was supported by USAID through a grant to the CORE Group Polio Project.

Ethical considerations

The Somali region health bureau ethical committee reviewed and approved the study. Ethical clearance for the study was obtained from the ethics committee of the Somali region health bureau. (Certificate permit number, SRHB/18/2000-2005 on 20/6/19). Informed consent was obtained from each participant for the in-depth interview, observation, and exit interview. The observation was conducted after obtaining informed consent both from the health worker and caregiver.

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

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

e-ISSN: 2602-3482

IJHSRP

Research Article

FREQUENCY AND POWER ANALYSIS OF EEG THETA ACTIVITY DURING DIFFERENT NUMERICAL AND VERBAL TASK IN MALES

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Abstract: *The brain forms EEG waves due to mental processes. This study aims to investigate the effectiveness of the EEG theta wave formed in the brain during different numerical and verbal tasks. Twenty healthy medical male students without any health problems were included in the study. The five questions were answered by the subjects via PowerPoint on the computer screen. Bipolar electrode positioning was performed. In this study, domain measurements, FFT, and power spectral density were analyzed. As a result of the study, no statistically significant difference was found between EEG theta waves obtained as a result of both numerical and verbal correct and incorrect answers ($p>0.05$). An increase in mean amplitude was found in both the numerical and verbal processes to respond incorrectly. As a result, no significant change was observed in the domain measurements, frequency, and power analysis of EEG theta waves during numerical and verbal correct and incorrect responses.*

Keywords: *Theta, FFT, PSD, mental, verbal, numerical*

Received: April 24, 2020 Accepted: June 17,2020

1. Introduction

EEG is used to measure the functional state and electrical activity of the brain. Different brain waves accompany the rhythmic activity of the brain. In particular, the theta wave shows activity in the frequency range 4-7 Hz. Theta wave does not affect phase I of sleep but also in working memory, mental effort, short-term memory loadings, and cognitive events [1]. EEG measures neurobiological studies that occur in mental processes, resting states, and cognitive processes and directly measures the electrical activity of the brain [2]. It is known that the analysis of human EEG during various motor and image tasks is useful for evaluating the links between nervous system functions and behaviors and provides a simple measure of neural activity in real-time. The EEG is captured using wired sensors connected to specific locations along with the head [3]. Due to its non-invasive nature, EEG detection is widely used in many areas such as neurophysiology, psychology, pathophysiology, cognitive neuroscience, neuro-engineering, and even social psychology. Also, many studies have interpreted the relationship between specific mental states and EEG [4]. In the process of working memory, an increase in theta activity is observed, and a decline in memory working decreases the activity of the theta wave [5]. However, in

some studies, in the process of difficult mathematical tasks, the degree of difficulty of the mathematical problem can be discussed, it is reported that there is no significant change in theta wave [6].

In our study, we established the hypothesis that there is a change in the theta wave between different numerical and verbal processes. In this study, we investigated the changes in the parameters of Fast Fourier Transformation (FFT), Power Spectral Density (PSD), and domain measurements of theta wave in mental processes.

2. Materials and Methods

The subjects included in the study declared that they are healthy and have no disease. Therefore, they do not include any neurological disorders, smoking status, and medical drug consumption, and other disease groups. 20 healthy medical male students with no health problems were included in the study. The average age is 21.15±2.10 years. The study was started after the consent of all subjects.

Ethical Procedure: Kırsehir Ahi Evran University Faculty of Medicine Clinical Research Ethics Committee decision was taken (2019-07/85). The experiment was carried out according to the Declaration of Helsinki.

2.1. Experimental procedure and EEG data acquisition

All subjects continued for 10 seconds for numerical and 10 seconds for verbal procedures. Biopac sterile disposable electrodes lead set (EL503) were placed on the left side of the skull. The earth electrode was placed under the ear. Using Biopac MP36 Student Lab software version 4.1 (BIOPAC System Inc., Goleta, CA, USA), analysis of the raw EEG waves for the theta wave was performed.

In this study, mental procedures were performed with two different methods. The average response was 5 seconds for 10 missions. Method 1: numerical correct questions; a) 9X2 = 18, b) 35/7 = 5, c) 108+3 = 111, d) 57-8 = 49. Numerical incorrect operations; a) 9X2 = 16, b) 35/7 = 8, c) 108+3 = 1111, d) 57-8 = 41.

Method 2: Verbal correct questions; a) Turkey's capital? = Ankara, b) Who is the president of the United States? = Trump c) What is the name of the college you're studying? = Kırşehir Ahi Evran University, d) What will your profession be when you graduate from this department? = Doctor.

Verbal incorrect operations; a) Turkey's capital? = Istanbul, b) Who is the US's president = Obama, c) What is the name of the university where you are studying? = Ankara University, d) What profession will you do after graduating from this university? = Engineer.

This study was carried out at Kırşehir Ahi Evran University. The Biopac MP36 student experiment system was used for recording with bipolar electrodes. The electrodes were placed on the left side of the head. Domain measurements, FFT, and PSD measurements of EEG theta signals were measured during mental procedures from all subjects. Figure 1 shows the experimental design, figure 2 shows the FFT analysis, figure 3 shows the PSD analysis, and figure 4 shows the raw EEG analysis.

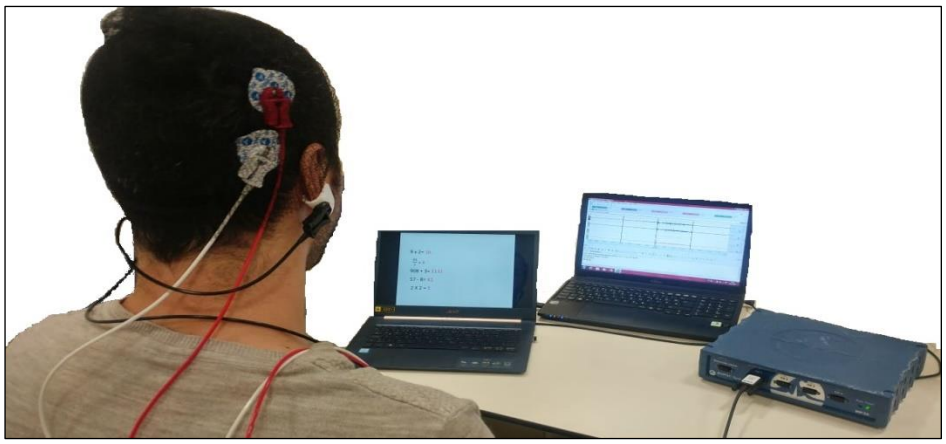

Figure 1. Experimental design

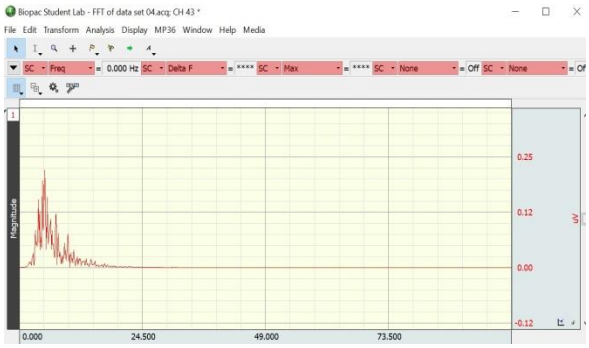

Figure 2. FFT analysis example

Figure 3. PSD analysis example

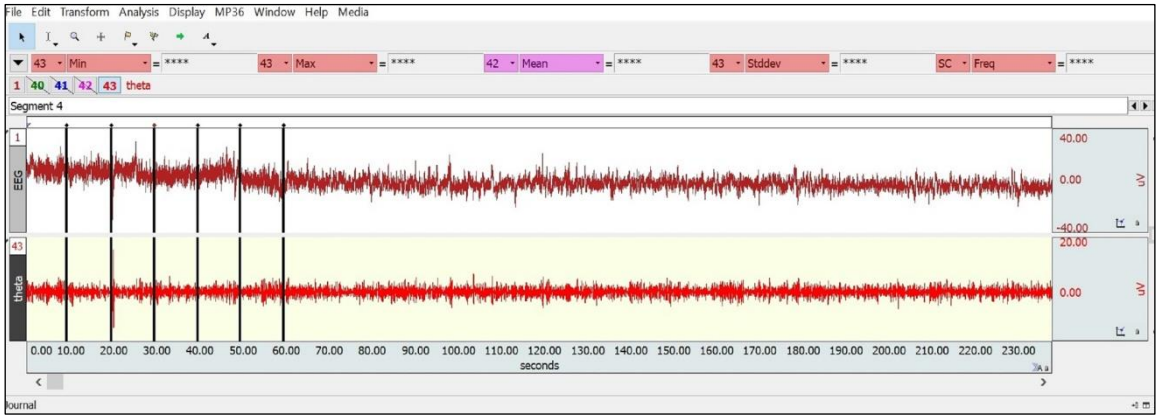

Figure 4. EEG raw data analysis and theta wave

2.2. Data Analysis

The normality hypothesis was tested by the Kolmogorov-Smirnov and the Shapiro-Wilk tests. Descriptive statistics of the variables are given as Mean±Standart deviation, Median (25th percentile - 75th percentile). Paired t-test and Wilcoxon matched-pair test were used for univariate analysis of dependent variables. Statistical analysis of the study was performed by using Statistical Package for Social Sciences version 21.0 software for Windows (V.21.0. Armonk, NY: IBM Corp., USA).

3. Results

In this study, 3 electrodes were placed on the left side of the subjects as shown in Figure 1. The analysis was performed with the help of two computers. Mental tasks were monitored in one computer and the EEG record was measured on the other computer. In our study, time-based field measurements were taken. These are shown in Table 1 and Table 2. Min: The minimum measurement finds the minimum amplitude value within the selected area. Max: The maximum measurement finds the maximum amplitude value within the selected area. Mean: The mean measurement computes the mean amplitude value. Std: Standard deviation is a measure of the variability of data points. Skew: Skew is a statistical measure of the degree of asymmetry in a distribution. The normal distribution has a skew of 0. The left tail has a negative skew, the right tail has a positive skew. Kurtosis: It indicates the degree of peaknedness in distribution, e.g. the size of the "tails" of the distribution. Lin reg: It is a better method to calculate the slope when you have noisy, erratic data [7].

Table 1. Domain measurements (Mean parameter results for 20 subjects)

Mean (μV)	**Min** (μV)	**Max** (μV)	**Std dev** (μV)	**Skew** (μV)	**Kurtosis** (μV)	**Lin reg** (μV)	**FFT Max Value**	**FFT Max F**	**PSD Max F**	**PSD Max Power**
Correct calculation of numerical question for Theta, 10 sec										
0.0025	-8.3887	8.4343	2.3219	0.0089	4.4417	0.0001	0.247	5.394	5.505	0.007
Miscalculation of numerical question for Theta, 10 sec										
0.0029	-6.7304	7.3858	2.2174	0.0697	3.3104	-0.0001	0.253	5.312	4.905	0.007
Correct answer to the verbal question for Theta, 10 sec										
-0.0092	-7.5684	7.6766	2.3793	-0.0137	2.9594	0.0019	0.275	5.15	5.252	0.009
Incorrect answer to the verbal question for Theta, 10 sec										
-0.0009	-8.0445	8.4283	2.4155	0.0084	3.5146	-0.0024	0.273	5.549	5.227	0.008

During numerical correct tasks, mean: 0.0025 μV, FFT value: 0.247 μV, FFT max Frequency: 5.394 Hz, PSD max power: 0.007μV^2/Hz, PSD max Frequency: 4.905 Hz. When numerical tasks are answered incorrectly, mean: 0.0029, FFT value: 0.253, FFT max Frequency: 5.312 Hz, PSD max power: 0.007 μV^2/Hz, PSD max Frequency: 4.905 Hz was found to be. Verbal during correct tasks, mean: -0.0092 μV, FFT value: 0.275 μV, FFT max Frequency: 5.150 Hz, PSD max power: 0.009 μV^2/Hz, PSD max Frequency: 5.252 Hz. When verbal tasks are answered incorrectly, mean: -0.0009, FFT value: 0.273, FFT max Frequency: 5.549 Hz, PSD max power: 0.008 μV^2/Hz, PSD max Frequency: 5.227 Hz was found to be.

There was no significant difference between numerical correct calculation and numerical incorrect calculation in all variables ($p>0.05$). Similarly, verbal mental tasks were examined and there was no statistically significant difference between right and wrong theta waves in all variables ($p>0.05$).

Table 2. Comparison of frequency and power spectral densities obtained from correct and incorrect numerical and verbal responses

Parameters for Theta	Mean ± Standart deviation, Median (25th percentile - 75 th percentile)	Mean ± Standart deviation, Median (25th percentile - 75 th percentile)	P
	Numerical correct calculation	Numerical miscalculation	
FFT Max value (μV)	0.239 (0.1720~0.3020)	0.226 (0.2102~0.2957)	0.538
FFT Max F (Hz)	5.029 (4.3205~6.6160)	4.931 (4.5890~5.9320)	0.881
PSD Max F (Hz)	5.058 (4.6690~6.5167)	5.058 (4.669~5.7387)	0.217
PSD Max Power (μV^2/Hz)	0.005 (0.0030~0.0105)	0.005 (0.004~0.0077)	0.867
	Correct answer to the verbal question	Incorrect answer to the verbal question	P
FFT Max value (μV)	0.27505 ± 0.0901	0.27325 ± 0.0692	0.924
FFT Max F (Hz)	5.1509 ± 1.4377	5.5495 ± 1.1016	0.138
PSD Max F (Hz)	5.2525 ± 1.1882	5.2278 ± 1.3281	0.918
PSD Max Power (μV^2/Hz)	0.0065 (0.004~0.0130)	0.0060 (0.005~0.01275)	0.684

P>0.05 was not statistically significant.

4. Discussion

In a study conducted by the Jamos et al., in the cognitive performance study of 20 women, it was stated that there was an increase in the relative power of EEG theta waves [8]. The researchers observed an increase in theta activity during memory study and a decrease in the efficiency of the theta wave after memory tasks [9]. As a result of intracranial EEG recording from the hippocampus of 10 epilepsy patients, two different verbal memory tasks were performed, and it was reported to be proportional to theta strength that increased with memory performance by hippocampal stimulation [15]. İshii et al. indicated that theta rhythms increased during focused attention on mental computation [10]. It is stated that the amplitudes of the theta wave are higher during mental arithmetic performance [11]. It was found that there was a power increase in EEG theta bands in short-term memory processing processes on 10 women [12]. In the study conducted on 16 participants, it was stated that there was an increase in frontal theta rhythms during mental arithmetic tasks [13]. In our study, it was observed that theta activity in the numerical tasks with the correct answer decreased compared to the theta activity with the wrong answer. No change in the power spectral densities of those who gave the correct answer and responded incorrectly in numerical tasks was observed. In verbal tasks, an increase in FFT max value and PSD max power was observed in the process of responding correctly, while no significance was observed in FFT and PSD. No significant decrease or increase was observed between FFT and PSD

parameters ($p>0.05$). In our study, there was an increase in average amplitude in the wrong response processes and this was compatible with the literature, but no significant change was observed in the FFT and PSD parameters. It is uncertain that this is related to the excitement of the subjects.

The researchers found an increase in the activity of the EEG theta wave during 4 different mental arithmetic tasks [14]. The researchers received the EEG recording from 17 healthy male participants, and the participants were asked a total of 10 questions, consisting of numerical, visual, and verbal questions with different degrees of difficulty in their favorite music and traffic noise environments. As a result of the study, it was concluded that while solving difficult problems, people are more affected by the environment than solving simple problems [16]. In our study, an increase in mean amplitude was found in both the numerical and verbal processes to respond incorrectly. It was observed that the maximum frequency in the raw EEG record taken from the subjects for the theta wave was in the range of 4-7 Hz. No significant difference was observed in power analysis in numerical and verbal correct and wrong answer tasks. We could not find a statistically significant difference between FFT, PSD, and mean values during numerical and verbal tasks ($p>0.05$). When we look at our literature and study findings, it can be seen that EEG recording may be affected by environmental conditions and the importance of recording is remarkable.

Our study is thought to contribute to the literature due to the low number of similar studies. In addition, the number of subjects was kept close to the literature studies during the study, but it is a matter of curiosity on how the results may change if the sample volume increases. However, since the working conditions are standard, the work has repeatability. The disadvantage of this study seems to be the extent to which the environmental and subjects' effects are not fully understood. Therefore, more detailed studies are needed with different numerical and verbal tasks. Thus, more studies are needed regarding theta change in fixed EEG recording and how it changes when mental tasks are applied.

5. Conclusion

In this study, the activity of the theta wave formed in the brain during the different responses to the same numerical and verbal task was interpreted. Thus, how the brain behaves in the right and wrong answers is still a mystery. It is important that a person responds incorrectly to something right, and the possibility that it can be detected. It is suggested that the new studies should be attentive to the studies by considering the effects such as electrode-induced effects, noises from the devices and subjects, ambient sounds, psychological state, and excitement. Therefore, we could not observe a significant change in the study, but a more detailed analysis is needed for investigating the brain waves generated during these processes.

Ethical Procedure: Kırsehir Ahi Evran University Faculty of Medicine Clinical Research Ethics Committee decision was taken (2019-07/85). The experiment was carried out according to the Declaration of Helsinki.

The compliance to Research and Publication Ethics: This work was carried out by obeying research and ethics rules.

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

e-ISSN: 2602-3482

IJHSRP

Research Article

EFFECT OF EATING ATTITUDES OF INDIVIDUALS WITH TYPE 2 DIABETES UPON QUALITY OF LIFE

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Abstract: *Eating disorders, which are one of the most important causes of poor glycemic control, increase weight gain among diabetic people, complicate weight loss, and reduce the quality of life by aggravating diabetic complications. The current study was undertaken to explore the effect of eating attitudes of individuals with Type 2 diabetes upon the quality of life. This descriptive and cross-sectional study was done with 127 Type 2 diabetic individuals between November 2019 and March 2020. The data were gathered using the Patient Information Form, Eating Attitudes Test, and The Diabetes Quality-of-Life Measure. The average age of the participants was 58.77±8.78 years, 62.2% of them were female and 42.7% of them showed a cutoff point of ≥30 for eating attitudes. There was a negatively significant correlation between the Type 2 diabetic individuals' total score of eating attitudes test and the sub-dimensions of satisfaction with treatment, the impact of treatment, worries about future effects of diabetes and total diabetes quality of life scores (r=-.493, p=0.000; r=-.226, p=0.011; r= -.193, p=0.030; r=-.390, p=0.000) but a positively significant and moderate correlation between the sub-dimension of worries about social and vocational issues and total score of eating attitudes test (r=0.304; p=0.001). It was determined that individuals with Type 2 diabetes with impaired eating behaviors had a low quality of life. It is recommended that with the first diagnosis, individuals' eating behaviors should closely be monitored and they should be informed of the importance of eating and nutrition in diabetes.*
Keywords: *Diabetes mellitus, Type 2, Eating behavior, Quality of life.*

Received: April 2, 2020 Accepted: May 28, 2020

1. Introduction

Diabetes Mellitus (DM) is a metabolic disease characterized by chronic hyperglycemia caused by insulin secretion, insulin activity, or both of them. The most frequently seen diabetes are Type 2 DM (T2DM) –a combination of weak insulin resistance and poor insulin secretion- and Type 1 DM (T1DM) –characterized with insulin secretion deficiency- [1]. According to the report of the International Diabetes Federation (IDF) 2019; the number of people living with DM across the world was nearly 463 million and it is anticipated that the number will have reached over 700 million by 2045 and global DM prevalence will go up gradually. In Turkey; the number of people living with DM is estimated to be nearly 6.5 million and by 2045 the number of diabetic individuals will be almost 10.4 million by putting Turkey among one of the 10 countries where diabetes takes place most [2]. The prevalence of DM and diabetic complications increase morbidity and mortality and decrease quality of life [3, 4]. İt is very essential to prevent complications in DM. Complications can be prevented with glycemic control [3].

For glycemic control; patients should adopt some lifestyle changes such as healthy eating behaviors, exercise, and weight control [5].

Eating disorders (ED), one of the most crucial causes of poor glycemic control, aggravate weight gain among diabetic people, complicate weight loss, and worsen DM complications [5, 6]. In addition to ED; impaired eating attitudes are among the widest problems of DM patients with poor glycemic control and high BMI and prevalence of ED is reported to change from 12.2 % to 40 % in T2DM individuals [1, 6-8]. Literature also underlines that ED and worsened eating attitudes cause anxiety among DM patients and their quality of life decreases [1, 9].

In treating T2DM individuals, eating and nutrition play a key role in preventing disease complications or delaying the emergence of these complications and -therefore- in elevating the quality of life. Therefore, it is necessary to regularly assess symptoms of ED when providing routine care to T2DM individuals [7]. Understanding the correlation between the quality of life, ED and T2DM better will help both health personnel and patients prevent T2DM and will ease the global burden.

The current study was undertaken to explore the effect of eating attitudes of individuals with Type 2 diabetes upon the quality of life.

2. Materials and Methods

2.1. Design and Sample

This study was conducted descriptive and cross-sectional. The population consisted of the T2DM patients who presented to internal medicine department of a research and training hospital located in northern Turkiye between November 2019 and March 2020 and the sample of the study consisted of 127 T2DM individuals who (a) were aged ≥18 years, (b) were diagnosed with T2DM diagnosis for at least one year (c) took oral anti-diabetic medicines and/or insulin, (d) were not pregnant, (e) did not have communication and perception problems, (f) presented to the internal medicine department for medical examinations during study-period and (g) volunteered to join the study.

2.2. Data Collection

Data for the current study were collected by means of Eating Attitudes Test, Diabetes Quality of Life Measure, and a Patient Information Form developed by the researchers following a comprehensive review of the literature [7, 10-13]. After the questionnaire form was prepared, a preliminary interview was held with 5 patients and necessary corrections were made and the investigation started. The questionnaire was collected by researchers using face to face interview technique. Filling in the data collection forms took approximately 35-40 minutes.

2.2.1 Patient Information Form

The questionnaire consisted of 16 close-ended questions about the patients' socio-demographic and disease features such as age, gender, Body Mass Index (BMI), Hemoglobin A1c (HbA1c), education status, marital status, work status, income status, diagnosis duration (years), coexisting diseases, treatment type, engaged in diet, hypoglycemia attacks, hyperglycemia attacks, maintaining body weight, being knowledgeable about eating-nutrition.

2.2.2 Eating Attitudes Test (EAT)

The test was developed by Garner and Garfinkel [14] and its Turkish validity and reliability tests were performed by Savaşır and Erol [15]. The test includes 40 questions and responses are in 6 points Likert type "always-never". For the items 1,18,19,23,27 and 39; "sometimes" is marked as 1 point, "rarely" 2 points and "never" 3 points while other options are marked as 0. For the rest of the items; "always" is marked as 3 points, "very frequently" 2 points, "frequently" 1 point, and other options are marked as 0 points. The total score is determined by adding up the points. The cutoff point for EAT 40 is 30. Thirty points and above are significant and the level of the total score is directly related to the level of psychopathology. The distinction score for the diagnosis of anorexia was determined to be 30. Cronbach alpha reliability coefficient was 0.70 in the study of Savaşır and Erol [15]. In this study, the Cronbach alpha reliability coefficient was 0.87.

2.2.3 Diabetes Quality of Life Measure (DQOL)

Original version of the measure, developed in 1970 by Brislin [16], is consisted of four sub-dimensions: satisfaction with treatment (15 items), the impact of treatment (20 items), worries about future effects of diabetes (4 items) and worries about social and vocational issues (7 items). The measure is a 5-point Likert type with 46 questions. Scoring is between 1 and 5 points and points marked for each question are summed and the sum is divided by the number of questions. Thus, the average score is obtained. Lower scores indicate a higher quality of life [16]. Turkish validity and reliability tests of DQOL were performed by Yıldırım et al. in 2007 and Turkish adapted version has 45 questions and 4 sub-dimensions [satisfaction with treatment (15 items), the impact of treatment (20 items), worries about future effects of diabetes (4 items), and worries about social and vocational issues (7 items)]. Points from 1 to 5 are given to each question and reverse-scoring is used [17]. Cronbach alpha reliability coefficient was 0.89 in the study of Yıldırım et al. [17]. In this study, the Cronbach alpha reliability coefficient was 0.78.

2.3. Data Analysis

Statistical analyses of the data were done using SPSS (Statistical Package for the Social Sciences, Chicago, Illinois) 21.0 software. Categorical variables were summarized as numbers and percentages and continuous variables as mean ± standard deviation (SD). Distributions of the variables were measured by using the Shapiro-Wilk test or Kolmogorov-Smirnov test. Cronbach's alpha value was found using reliability analysis. Independent t-tests were used in two groups which had continuous variables. One-way analysis of variance (ANOVA) was used for more than two groups. Spearman Correlation Analysis was used to determine the relationship between dependent and independent variables. A two-sided p-value < 0.05 was considered significant for all analyses.

Ethical Consideration: Before data collection, Ethics committee approval was gained from the Burdur Mehmet Akif Ersoy University (Decision Date and Number: 04.9.2019; GO 2019/132). The study protocol was conducted according to the Declaration of Helsinki. Written permission was obtained from the Director Office of Hospital. Written consents of the patients, who participated in the study, were obtained after reading an informed consent.

3. Results

Average age, BMI, HbA1c and diagnosis duration of the participating T2DM individuals were 58.77 ± 8.78 (min: 41- max: 80), 29.82 ± 5.65 (min: 17.4 - max: 45.9), 7.67 ± 1.69 (min: 5 - max: 13.2)

and 15.77 ± 6.33 (min: 8 - max: 46); respectively. 62.2 % of the participants were female, 59.8 % of them had primary school graduation, 80.3 % of them were married, 16.5 % of them did not work at all and 59.1 % of them had an income equal to expenses. 77.2 % of the T2DM individuals presented another coexisting disease, 41.7 % of them received oral antidiabetic (OAD) treatment, 29.9 % of them were engaged in diets, 5.5 % of them sometimes had hypoglycemia -7.1 % had hyperglycemia attacks, 26.8 % of them maintained body weight and only 18.9 % of them were knowledgeable about eating and nutrition in diabetes. Since EAT cutoff was 30; 52.8 % of the participant T2DM individuals showed a cutoff point of < 30 whereas 42.7 % of them showed a cutoff point of ≥30 (Table 1).

Table 1. Distribution of T2DM patients by descriptive characteristics

Descriptive characteristics	n	%
Gender		
Female	79	62.2
Male	48	37.8
Education status		
Primary school	76	59.8
High school	27	21.3
University graduate	24	18.9
Marital status		
Married	102	80.3
Single	25	19.7
Work status		
Employed	21	16.5
Unemployed	106	83.5
Income status		
Less than expenses	46	36.2
Equal to expenses	75	59.1
More than expenses	6	4.7
Coexisting diseases		
Yes	98	77.2
No	29	22.8
Treatment type		
Diet	3	2.4
OAD	53	41.7
Insulin	29	22.8
OAD+Insulin	42	33.1
Engaged in diet		
Yes	38	29.9
Sometimes	15	11.8
No	74	58.3
Hypoglycemia attacks		
Sometimes	7	5.5
No	120	94.5
Hyperglycemia attacks		
Sometimes	9	7.1
No	118	92.9
Maintaining body weight		
Yes	34	26.8
No	93	73.2
Being knowledgeable about eating-nutrition		
Yes	24	18.9
No	103	81.1
EAT		
< 30	67	52.8
≥ 30	60	47.2
Total	**127**	**100.0**

As seen in Table 2; among the participant T2DM individuals, there was no statistically significant difference between DQOL sub-dimensions-satisfaction with treatment, the impact of treatment, worries about future effects of diabetes, worries about social and vocational issues and total DQOL score and educational status, marital status, income status, coexisting diseases, treatment type and being knowledgeable about eating-nutrition in diabetes ($p>0.05$). No statistically significant difference was found in the participant T2DM female individuals' scores of satisfaction with treatment, the impact of treatment, worries about future effects of diabetes and total DQOL scores ($p>0.05$) whereas female individuals' scores in worries about social and vocational issues were higher as compared to male patients ($p<0.05$). No statistically significant difference existed between T2DM individuals' employment status and the scores of satisfaction with treatment, the impact of treatment and worries about future effects of diabetes ($p>0.05$) whereas the employed individuals' scores in worries about social and vocational issues and total DQOL score were higher than those unemployed ($p<0.05$).

Scores of satisfaction with treatment, the impact of treatment, worries about future effects of diabetes and total DQOL score among those participant T2DM individuals who responded "partly" and "no" to the question about engagement in diets were identified to statistically be higher as compared to those responding "yes" to the same question ($p<0.05$). There were statistically significant differences between the prevalence of DM individuals' hypoglycemic attacks and scores in the impact of treatment, worries about future effects of diabetes and total DQOL score; between the prevalence of hyperglycemia attacks and scores in the impact of treatment and worries about future effects of diabetes and between maintaining body weight and scores in satisfaction with treatment, the impact of treatment and total DQOL score ($p<0.05$). Those participant T2DM individuals whose EAT cutoff point was < 30 demonstrated a higher score in satisfaction with treatment and a higher total DQOL score as compared to those whose cutoff point was ≥30. Those participant T2DM individuals whose EAT cutoff point was ≥30 demonstrated a higher score in worries about social and vocational issues as compared to those whose cutoff point was < 30 ($p<0.05$).

Table 2. Comparison of individuals with T2DM with DQOL scale and sub-dimensions

Descriptive characteristics	Satisfaction with treatment	Impact of treatment	Worries about the future effects of diabetes	Worries about social and vocational issues	DQOL Total
Gender*					
Female	2.60 ± 0.43	3.56 ± 0.45	3.81 ± 0.48	4.69 ± 0.12	3.43 ± 0.29
Male	2.65 ± 0.37	3.52 ± 0.41	3.85 ± 0.46	4.58 ± 0.19	3.42 ± 0.25
Test statistics	2.898	0.355	0.535	22.448	1.988
p	0.485	0.613	0.695	**0.001**	0.812
Education status**					
Primary school	2.53 ± 0.39	3.42 ± 0.41	3.75 ± 0.45	4.71 ± 0.12	3.35 ± 0.26
High school	2.73 ± 0.49	3.63 ± 0.46	4.00 ± 0.51	4.71 ± 0.22	3.40 ± 0.29
University graduate	2.83 ± 0.32	3.78 ± 0.45	4.00 ± 0.51	4.71 ± 0.17	3.61 ± 0.29
Test statistics	1.820	2.890	0.965	2.128	2.213
p	0.166	0.054	0.384	0.123	0.239
Marital status*					
Married	2.59 ± 0.39	3.55 ± 0.45	3.84 ± 0.47	4.64 ± 0.17	3.43 ± 0.28
Single	2.70 ± 0.46	3.50 ± 0.39	3.79 ± 0.48	4.66 ± 0.13	3.44 ± 0.28
Test statistics	1.794	0.927	0.063	1.254	0.042
p	0.226	0.623	0.621	0.723	0.825

Table 2. (Continued)

Work status*					
Employed	2.58 ± 0.43	3.41 ± 0.50	3.78 ± 0.51	4.35 ± 0.18	3.31 ± 0.28
Unemployed	2.62 ± 0.40	3.57 ± 0.42	3.84 ± 0.47	4.71 ± 0.06	3.45 ± 0.27
Test statistics	0.124	1.252	0.017	42.497	0.051
p	0.664	0.145	0.625	**0.000**	**0.038**
Income status**					
Less than expenses	2.70 ± 0.38	3.55 ± 0.43	3.75 ± 0.39	4.71 ± 0.12	3.53 ± 0.27
Equal to expenses	2.66 ± 0.42	3.52 ± 0.44	4.00 ± 0.52	4.71 ± 0.17	3.37 ± 0.28
More than expenses	2.33 ± 0.32	3.47 ± 0.46	3.87 ± 0.51	4.42 ± 0.21	3.23 ± 0.29
Test statistics	0.910	0.216	0.024	0.914	0.922
p	0.405	0.806	0.976	0.412	0.401
Coexisting diseases*					
Yes	2.63 ± 0.41	3.54 ± 0.43	3.85 ± 0.45	4.66 ± 0.14	3.44 ± 0.27
No	2.56 ± 0.40	3.53 ± 0.46	3.75 ± 0.56	4.61 ± 0.20	3.39 ± 0.29
Test statistics	0.030	0.047	2.108	7.782	0.022
p	0.419	0.881	0.292	0.170	0.439
Treatment type**					
Diet	2.80 ± 0.21	3.78 ± 0.69	4.25 ± 0.80	4.57 ± 0.21	3.75 ± 0.40
OAD	2.46 ± 0.42	3.68 ± 0.39	4.00 ± 0.48	4.71 ± 0.16	3.42 ± 0.29
Insulin	2.66 ± 0.43	3.57 ± 0.36	3.75 ± 0.48	4.71 ± 0.19	3.35 ± 0.24
OAD+Insulin	2.70 ± 0.37	3.34 ± 0.48	3.75 ± 0.42	4.71 ± 0.13	3.36 ± 0.29
Test statistics	1.617	1.825	2.123	1.107	1.037
p	0.189	0.200	0.101	0.349	0.379
Engaged in diet**					
Yes[a]	2.20 ± 0.26	3.36 ± 0.35	3.75 ± 0.41	4.71 ± 0.16	3.20 ± 0.14
Sometimes[b]	2.86 ± 0.35	3.73 ± 0.30	3.75 ± 0.36	4.71 ± 0.13	3.57 ± 0.17
No[c]	2.86 ± 0.30	3.57 ± 0.47	4.00 ± 0.51	4.71 ± 0.16	3.57 ± 0.28
Test statistics	57.421	4.526	3.298	2.209	26.389
p	**0.000**	**0.013**	**0.040**	0.114	**0.000**
	b>a; c>a	**b>a, c>a**	**b>a, c>a**		
Hypoglycemia attacks*					
Sometimes	2.73 ± 0.37	3.12 ± 0.29	2.89 ± 0.24	4.63 ± 0.19	3.20 ± 0.13
No	2.61 ± 0.41	3.57 ± 0.43	3.88 ± 0.42	4.65 ± 0.16	3.44 ± 0.28
Test statistics	0.832	2.333	2.732	0.949	8.623
p	0.455	**0.008**	**0.000**	0.744	**0.027**
Hyperglycemia attacks*					
Sometimes	2.76 ± 0.36	3.20 ± 0.30	3.05 ± 0.39	4.65 ± 0.19	3.26 ± 0.17
No	2.61 ± 0.41	3.57 ± 0.43	3.89 ±0.43	4.65 ± 0.16	3.44 ± 0.28
Test statistics	0.747	1.857	0.414	0.735	5.438
p	0.333	**0.015**	**0.000**	0.975	0.059
Maintaining body weight*					
Yes					
No	2.20 ± 0.26	3.39 ± 0.37	3.69 ± 0.42	4.60 ± 0.16	3.21 ± 0.15
	2.77 ± 0.34	3.60 ± 0.45	3.88 ± 0.48	4.66 ± 0.16	3.51 ± 0.27
Test statistics	2.178	3.092	0.928	1.927	21.814
p	**0.000**	**0.021**	0.056	0.072	**0.000**
Being knowledgeable about eating-nutrition*					
Yes	2.67 ± 0.36	3.57 ± 0.43	3.82 ± 0.56	4.67 ± 0.14	3.46 ± 0.28
No	2.60 ± 0.42	3.53 ± 0.44	3.83 ± 0.45	4.64 ± 0.16	3.42 ± 0.28
Test statistics	0.232	0.699	0.369	1.195	0.032
p	0.468	0.686	0.912	0.504	0.509
EAT*					
< 30	2.73 ± 0.36	3.61 ± 0.48	3.88 ± 0.51	4.60 ± 0.20	3.49 ± 0.29
≥ 30	2.48 ± 0.41	3.47 ± 0.37	3.77 ± 0.43	4.70 ± 0.05	3.36 ± 0.25
Test statistics	1.837	6.661	1.825	90.889	3.866
p	**0.000**	0.074	0.200	**0.000**	**0.006**

*Independent Sample T Test; **One-way ANOWA

A positive, significant but weak correlation was found between the participant T2DM individuals' DQOL total score and age (*r= 0.232, p=0.009*) but no correlation was found between EAT total score and age (*r=-.153, p=0.086*). A negative and moderately significant correlation existed between the participant T2DM individuals' DQOL total score and BMI (*r=-.425, p=0.000*) whereas a positively and moderately significant correlation was found between EAT total score and BMI *(r=0.326, p=0.000*). The participant T2DM individuals' DQOL total score and HbA1c were negatively, significantly, and moderately correlated (r=-.406, p=0.000) but no correlation was found between EAT total score and HbA1c (*r=0.060, p=0.506)*. There was not a statistically significant difference between the participant T2DM individuals' DQOL total score, EAT total score, and diagnosis duration (*r=0.079, p=0.375; r=-. 085, p=0.343*). The participant T2DM individuals' EAT total score and scores in satisfaction with treatment, the impact of treatment, worries about future effects of diabetes sub-dimensions and total DQOL score were negatively and moderately correlated (*r=-.493, p=0.000; r=-.226, p=0.011; r= -.193, p=0.030; r=-.390, p=0.000*) but score in worries about social and vocational issues and EAT total score were positively, significantly and moderately correlated (*r=0.304; p=0.001*) (Table 3).

Table 3. Relationship between some descriptive characteristics of individuals with T2DM and DQOL and EAT

Descriptive characteristics		Satisfaction with treatment	Impact of treatment	Worries about the future effects of diabetes	Worries about social and vocational issues	DQOL Total	EAT
Age	r	.232**	.036	.259**	.158	.238**	-.153
	p	.009	.692	**.003**	.077	.007	.086
BMI	r	-.425**	-.474**	-.237**	-.274**	.025	,326**
	p	**.000**	**.000**	**.007**	**.002**	.781	**.000**
HbA1c	r	-.406**	.046	-.532**	-.523**	-.001	.060
	p	**.000**	.611	**.000**	**.000**	.990	.506
Diagnosis duration	r	.079	.080	.061	-.007	.018	-.085
	p	.375	.370	.498	.939	.841	.343
EAT	r	-.390**	-.493**	-.226*	-.193*	.304**	1
	p	**.000**	**.000**	**.011**	**.030**	**.001**	-

**p<0.05* ; ***p<0.01* is significant at the level.

4. Discussion

Eating attitude disorders that are seen in DM are associated with weak metabolic control, weight gain, tendency not to pay attention to prescribed insulin doses, and increased prevalence in microvascular and macrovascular complications. Therefore, the coexistence of DM and eating attitude disorders causes a high risk for morbidity and mortality as well as a decrease in patients' quality of life [9]. In this sense; in the current study, the effect of T2DM individuals' eating attitudes upon their quality of life was discussed in light of literature.

Of chronic diseases; T2DM is one of these diseases that physically, socially, and psychologically influence patients' quality of life in terms of both disease outcomes and treatment process. Literature reports a poor quality of life in T2DM individuals [3, 4, 13, 18] and likewise, the current study yielded a low quality of life in T2DM individuals; which may be explained by the fact that DM complications damaging vital organs and nerves lead to life-threatening damages and thus, minimize patients' quality of life [13].

In T2DM individuals, ED is one of the crucial problems that produce insufficient glycemic control and reduce the quality of life. 42.7 % of the participant T2DM individuals demonstrated impaired eating behaviors. The rate of these eating behaviors was reported to be 40 % in the systematic review done by Garcia-Mayor et al. [6], 20 % in the study of Papelbaum et al. [7], 19.6 % in the study of Petroni et al. [11], 12.2 % in the study of Nicolau et al. [8] and 39.3 % in the study of Yılmaz and Çetinkalp [9]. Such factors as age, gender, metabolic status influence eating attitudes. Therefore; it may be argued that the characteristics of the participants in the current study affected this rate.

T2DM is a chronic disease associated with obesity and metabolic syndrome, and nutrition and eating management and weight control in this disease is a key in treatment as well as prevention. Mal-managed nutrition increases diabetic complications and thus ED deteriorates the quality of life [13]. In the study of Santana et al. [1], it was reported that ED and impaired eating behaviors in DM individuals led to a decrease and an impairment in individuals' quality of life. Cerrelli et al. [19] reported a correlation between disrupted eating behaviors in T2DM individuals and poor quality of life [1, 19]. Similarly; in our study T2DM individuals with impaired eating behavior showed the low quality of life. Parallel to the literature; it may be said that individuals with disrupted eating behavior show poor quality of life.

Female T2DM individuals are one of the groups whose quality of life is negatively affected [10, 13, 20]. In our study; among the T2DM women, only the scores in worries about social and vocational issues were found to be higher than T2DM men and the study of Bıyık and Akı [21] done to examine DM individuals' quality of life reported results similar to our study. In the current study, the reason why the scores in worries about social and vocational issues were higher in women may be related to the traditional gender roles of women in Turkish society because even if women play an active role in social life and work-life; they equally go on carrying a domestic burden; which appears to raise women's anxiety.

In our study, it was noted that T2DM individuals who were employed had a higher quality of life and similarly, the study of Bilgin et al. [22] on the quality living of T2DM individuals reported that the employed individuals' quality of life was higher. That Almogbel [13] stated a positive effect of employment status in T2DM individuals upon the quality of life concurred with our study finding. When individuals are employed and work in a job where they can have responsibilities, the level of their satisfaction with life goes up and as a result, we are of the opinion that employment status elevates the quality of life.

Nutrition and eating in DM are one of the crucial steps of treatment. The study of Kueh et al. [12, 23] reported that those T2DM individuals who were engaged in diets had a better quality of life. Likewise; in our study, those who were engaged in diets showed a higher quality of life as compared to those who were partly engaged in diets or those not engaged in diets at all. Similar to the literature; we may argue that the status of engagement in diets increases the quality of life.

Hypoglycemia is one of the important disorders in T2DM individuals that may cause physical and psychosocial morbidity. Green et al. [24] found a correlation between T2DM individuals' hypoglycemia and low quality of life. Similarly; Williams et al. [25] identified the negative effects of hypoglycemia of T2DM individuals upon the quality of life. Similar to our study finding, it may be suggested that hypoglycemia causes microvascular complications by influencing T2DM individuals' glycemic control negatively and reduces their quality of life.

In our study, it was concluded that as age increased in T2DM individuals, their quality of life decreased. Likewise; some studies underlined the same correlation between T2DM individuals' age and their quality of life [10, 26-29]. It may be considered that as disease duration lengthens with elevated age, physical functioning is deteriorated and risk for more complications goes up; which may end up with a reduced quality of life. In a healthy population, as age increases, the risk for ED is minimized [30]. Yet, some other studies found no correlation between T2DM individuals' age and their eating disorder, too [1, 8]. Likewise, our study too concluded that age did not affect ED.

Since most of the T2DM individuals are either overweight or obese, the correlation between BMI and quality of life is very important. In our study, it was identified that as BMI increased, quality of life decreased and those who maintained body weight presented a better quality of life. Likewise; in some studies, high BMI values turned out to negatively influence the quality of life [22, 27]. In our study, another dimension that BMI negatively affects is ED. Thus, some studies confirmed that as T2DM individuals' BMI values increase, so do their ED [5, 7, 8, 11]. It may be argued that disrupted eating behaviors are associated with high BMI. We were of the opinion that with increased weight, physical and psychological problems aggravate ED and –as a result- reduce the quality of life.

It is very crucial to keep a balanced and satisfactory glycemic control in life-style diseases like DM. HbA1c is one of the important clinical parameters for assessing glycemic control [28]. There are studies that proved that elevated HbA1c values (> %7) lead to low quality of life [20, 27, 28] and those that suggested no correlation between the quality of life and HbA1c [19]. In our study, high HbA1c was found to be correlated with low quality of life. For us, these differences may result from glycemic control awareness level of the sample groups and HbA1c values indicate a short term glycemic control. In our study, another finding related to HbA1c was that HbA1c demonstrated no correlation with impaired eating behaviors. Similarly; the study of Yılmaz and Cetinkalp [9] found no statistically significant correlation between HbA1c and eating attitudes. However; the study of Papelbaum et al. [7] concluded that T2DM individuals' ED is correlated with weak glycemic control only in the presence of high BMI. Similar to the literature; it may be concluded that HbA1c does not influence eating disorder behaviors.

In our study, it was identified that T2DM individuals' diagnosis duration did not affect the quality of life. Yet, some studies reported that as diagnosis duration increases, quality of life decreases [13, 28]. This difference between the studies may be explained by the differences in diagnosis duration of the samples. In these studies; diagnosis duration was determined as < 5 years and > 5 years. In our study, the minimum diagnosis duration was 8 years and the average diagnosis duration was 15.77 ± 6.33 years. It may be suggested that with long diagnosis duration, patients demonstrated a better conformation to and engagement in disease and treatment.

In conclusion, the results of the current study indicated that distorted eating behaviors and low quality of life were widespread in T2DM individuals. Meanwhile, those with impaired eating behaviors presented a low quality of life. According to these results, it is recommended that an assessment of distorted eating behaviors should be realized as a part of the clinical management of T2DM individuals.

We are of the opinion that in society, it will be helpful to teach proper and well-balanced eating habits, to provide training programs about diabetic eating and nutrition and health services of high quality so that society can adopt regular eating patterns and better quality of life patterns.

Acknowledgments

The authors would like to thank all the participants.

Ethical Consideration: Before data collection, Ethics committee approval was gained from the Burdur Mehmet Akif Ersoy University (Decision Date and Number: 04.9.2019; GO 2019/132). The study protocol was conducted according to the Declaration of Helsinki. Written permission was obtained from the Director Office of Hospital. Written consents of the patients, who participated in the study, were obtained after reading an informed consent.

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

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

e-ISSN: 2602-3482

IJHSRP

Research Article

THE EFFECT OF TWO DIFFERENT METHODS IN TERMS OF MALPRACTICE: A RANDOMIZED CONTROLLED STUDY

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Abstract: *The objective is to research the face-to-face method of education and the educational methods through information technology in the tendency and approach to medical errors and whether some characteristics create a difference in both these situations. It is randomized controlled intervention research with a pretest-posttest design. A power analysis was carried out and 60 individuals were included in the sampling. Pretesting was conducted through data collection tools before hospital implementations were commenced. The required interventions were conducted after hospital implementations were commenced. No interventions were made on the control group. The individual identificatory characteristics of the participants comprised the independent variables; the Medical Error Tendency Scale for Nurses (METSN) and Medical Error Attitude Scale (MEAS) comprised the dependent variables. The analyses were implemented via SPSS-22 program, and $p<0.05$ was regarded as the significance level. The mean age of the participants was 22.02 ± 3.33 (20-41). The pretest score from METSN was 217.51 ± 15.14, the posttest score from METSN was 220.18 ± 15.39, the pretest score from MEAS was 62.71 ± 5.24, and the posttest score from MEAS was 64.21 ± 5.18 in terms of Mean ± SD scores. No difference was found in the pretest and posttest scores from METSN and MEAS of the variables of age group, gender, income, the place lived in over a long period, whether the job was selected in accordance with one's own preference, satisfaction with job selection. A moderately positive correlation was found between the pretest and posttest scores from METSN and MEAS. Type of education received and some of the socio-demographic characteristics researched do not constitute any difference in terms of the tendency and attitude to medical error and malpractice; nevertheless, the posttest scores of the intervention groups were high. Evaluation of whether clinical skills make a difference may be recommended.*

Keywords: *Medical error, malpractice, tendency and attitude, face-to-face education, via information technology education*

Received: May 18, 2020 Accepted: June 30, 2020

1. Introduction

"Medical Error (ME)" or "Malpractice (M)" as expressed in another definition used in the literature, which was first recorded in 1671 and commonly used as of the second half of the 20th century was derived from "Male" and "Praxis" words in Latin, and it means "erroneous practice" [1]. The Joint Commission on Accreditation of Healthcare Organizations has defined this situation as "harm done to the patient as a result of the fact that a professional providing health service has committed an inappropriate and unethical behavior, and s/he has acted insufficiently and negligently in professional implementations" [2]. A medical side effect occurs that prolongs the length of hospital stay and / or causes an additional problem during discharge from hospital in %3.7 of the patients hospitalized and that harms them as a result. %58.0 of these side effects are due to (ME) / (M). ME / M is not only the erroneous, deficient implementation of an intervention, treatment, or practice, but it also denotes a procedure that wasn't conducted although it should have been, or that was conducted although it shouldn't have been [3]. Nursing is a job with substantial workload arising from the effects of many negative factors emanating from the work environment. Reasons such as excessive workload, emotional stress experienced due to patients' problems, working with patients in need of intensive care, and in the process of dying and working in shifts in particular in nursing make working conditions harder. Working under difficult conditions may increase the ME / M ratio of nurses during their nursing interventions [4]. According to a study specified in the national literature, medication errors that endanger patient safety are generally related to nurses [5-8].

ME / M causes prolongation of the treatment, additional costs, and emotional damage emanating from the treatment of new disabilities or complications [9]. In addition, ME / M brings with itself the loss of the morale and motivation of health professionals, distrust in patients towards health staff, and dissatisfaction in society with the health system. It has been stated in the "report on patient safety" of the WHO that patients in various countries, including Australia, Canada, England, Germany, and New Zealand experience ME / M and undesirable events. The frequency of unexpected ME / M is between %3.2 and %16.6 in these countries. One in every ten patients is seriously affected by errors committed during treatment; %14.0 of these errors result in death, and %70.0 of them result in various disabilities [10]. The training provided to the health staff is emphasized to have decreased ME / M in the literature [11,12]. Training on health can be provided today in many ways such as the traditional method or through information technology and information technology adventure has gained impetus, symmetry, mobility, and globality through new media technologies making the headlines since the 1960s [13]. Information technology can be defined as the use (obtaining) of modern knowledge in the electronic environment, which encompasses access, storing, data processing, and transfer or delivery [14]. Within this context, this study aims to compare whether face-to-face education method, preferred as an educational method since very old times and the method of information technology creates a difference in bringing ME / M tendency and attitude to desired levels. Whether some identificatory characteristics also make a difference in ME / M tendency and attitude will be determined through this study.

2. 2. Materials and Methods

2.1. Design

The study is intervention research with randomized control encompassing comparison of pretest and posttest. It is oriented towards the comparison of the pre-intervention awareness level of nursing

students in ME / M tendency and attitude with their post-intervention awareness level. The participants were randomly selected in this factually experimental design [15] defined as a two-factor mixed design with pretest-posttest control groups. The research design is also a mixed design relevant and irrelevant in itself. Since the participants were measured with respect to the dependent variable before and after the experimental implementation, it has a relevant pattern; since the measurements of the control groups made up of different subjects were compared to each other, it has an irrelevant pattern [16]. The population of the study was composed of all nursing students in their third year studying for their bachelor's degree in a state university (N = 119). Nursing students in their first year were excluded from the study because they are not allowed to perform an invasive intervention, nursing students in their second year were excluded from the study since their professional skills have not reached the desired level. In the third year, the course of pediatric nursing is offered. Within the scope of this course implementation, ME / M likelihood increased since procedures to be conducted on groups of infants were in the forefront. It was assumed that the ME / M tendency and attitude of the participants to stay with the group bearing risk had diversified over time since there were pediatric patients. A power analysis was implemented through G-power, and the appointment of individuals to be included in the groups was determined via research randomizer.

2.2. Inclusion criteria for volunteers to be included in the study

Being a nursing student in the third year, having WhatsApp / Messenger application that is accessible, being in the procedure of pediatric nursing, not having any language barriers

Collection of Data: The minimum sampling size to be attained in accordance with the results of G-power analysis is 51 individuals. For the purpose of increasing the representation ability of the sampling for the population, an extra %20 of the minimum sampling size was included in the study and the study was completed with 60 individuals. The number of groups in the research was designed to be three. Two of the groups were the intervention groups, and one of them was the control group (CG). The intervention groups were the Face-to-Face Education Group (FFEG) and the Information Technology Group (ITG). The simple random sampling method regarded [17] as valid and the best way of the selection of the representative sampling was used in the selection of the study groups. Groups, as specified below, were formed through Research Randomizer on the basis of a class list of 119 individuals. ***FFEG*****:** 118., 117., 116., 111., 102., 92., 75., 74., 73., 66., 58., 57., 55., 52., 44., 34., 11., 10., 7., and 1. individuals ***ITG*****:** 115., 114., 107., 105., 101., 93., 90., 88., 71., 68., 67., 63., 62., 48., 39., 32., 28., 24., 19., and 9. individuals ***CG***: 113., 108., 104., 100., 99., 95., 91., 86., 84., 81., 72., 61., 54., 50., 46., 42., 29., 27., 5., and 3. Individuals. Before hospital implementations were commenced for all three groups, a pretest was conducted via Medical Error Tendency Scale for Nurses (METSN) and Medical Error Attitude Scale (MEAS). During the pretest, the participants were told to choose a nickname for themselves, and the posttest was implemented in accordance with these nicknames. After hospital implementations were commenced, the required intervention techniques were applied to the participants: Training made up of three parts were provided to the FFEG regarding ME / M tendency and attitude on a face-to-face basis. These parts of training included the definition and significance of ME / M, commonness and history of ME / M, the reasons why it is frequently observed with nurses, how it can be prevented, duties, authorizations, and responsibilities in preventing ME / M, the state of ME / M in legal terms and what sanctions could be imposed. One part of the training was given by an expert nurse specialized in the field of occupational health and safety (in malpractice in particular); the

other parts were provided by a faculty member in the field of pediatric nursing and by a faculty member that provided the course of occupational fundamentals and technique. The same tests were re-administered as post-tests to all three groups at the end of four weeks. The materials of training were sent to the ITG through WhatsApp / Messenger in the form of PowerPoint presentations three times (for three weeks in total with a different subject for each week). It was ensured that the content of the training was the same as that of the training given to FFEG in order to prevent confusing impact. Whether the participants studied the presentation was determined and reinforced by the participants giving feedback through WhatsApp / Messenger. No interventions were made on the control group. The method of triple blinding was used in the study. Through this method, it was ensured that the participants, the narrator and the one implementing data entry and analysis did not know who was in which group.

Ethical Statement: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This study is approved by Bingöl University Ethics Committee (92342550/044; 19.06.2019)

2.3. Database Analysis

The situations of the participants researched in their form of individual identificatory characteristics comprised the independent variables of the study, and the questions measuring METSN and MEAS comprised the dependent variable of the study. Statistical Package for the Social Sciences-22 program was used for the analyses. In statistical evaluations, number and percentage, values , and rank averages are given. Before normality analyzes, missing data and extreme value extractions were made. Then, histogram drawings were made for compliance with normal distribution, skewness, and kurtosis values were examined, and Kolmogorov-Smirnov analyzes were performed. Logarithmic transformations were applied since the data did not show normal distribution. However, it was observed that the total and sub-dimension scores of the scales did not fit the normal distribution. For this reason, non-parametric tests [Mann Whitney U (MWU) and Kruskall Wallis (KW)] were used in the research. The averages were provided with standard deviations; $p<0.05$ was regarded as the significance level.

2.4. Tests Used in the Study

Individual Information Form: It was produced by the researchers, and it was for determining the properties of the participants such as age, gender, habits, chronic illness, the place where s/he spent her/his life over a long period of time, her / his perception regarding her/his income, her/his preference of the profession and her/his state of satisfaction with the job, her/his perception of the reason for ME / M.

***METSN*:** It was developed by Ozata and Altunkan [5] in 2010 for the purpose of measuring ME / M tendencies of nurses. The scale consists of 49 items. These items and their sub-items include " Medication and Transfusion Implementations" (MTI), "Falls" (F), "Hospital Infections" (HI), "Patient Monitoring / Material Safety" (PM / MS) and "Communication" (C). The scale is a 5-item Likert type. In the evaluation of the scale, the scoring range was determined as between 49 - 245. It has been stated that this ratio can also be divided by the count of expressions if desired. It has been demonstrated that the higher the average score of the scale gets, the tendency of nurses for committing ME gets lower and that the lower the average score of the scale gets, the tendency of nurses for committing ME gets higher. It has been specified that the Cronbach's Alpha coefficient of the scale developed is .95.

***MEAS*:** This scale, developed by Gulec and Intepeler in 2012, has 3 factors. The 1st factor was named "Medical Error Perception" (MEP), the 2nd factor was named "Medical Error Attitude (MEA) and 3rd factor was named "Reasons for Medical Error" (RME). The final version of MEAS is made up of 16 items and it is in the type of five-item Likert. The total scoring range of the scale is between 16 - 80. Two items on the scale are scored inversely. The cut-point of the scale was determined as 3. ME attitudes of the staff members getting an average below 3 in the scale are evaluated to be negative, ME attitudes of those getting 3 and over are evaluated to be positive. While the negative attitude indicates that the staff members have a low awareness of the significance of ME and error reporting, the positive attitude shows that there is a high level of awareness among staff members for the significance of medical errors and error reporting. The scoring and assessment criteria specified for the whole scale are regarded in the same way also for all sub-items of the scale. The Cronbach's Alpha reliability coefficient implemented for the purpose of testing internal consistency, one of the reliability indicators of MEAS and its sub-items, was reported to be 0.75 for the whole scale. As for the reliability coefficients of the internal consistency of the sub-items of the scale, they were disclosed as 0.74 for MEP item, as 0.62 for MEA item, as 0.60 for RME item.

3. Results

The mean age of the participants in the study was 22.02 ± 3.33, and %78.3 of them were females (the rate of female students in the department was %77.6). The rate of those with a chronic illness was %3.4, the rate of those that spend the majority of their lives in an urban area was %78.3. In this study, the pretest score from METSN is 217.51 ± 15.14 (177 - 245), the posttest score from METSN is 220.18 ± 15.39 (178 - 244), the pretest score from MEAS is 62.71 ± 5.24 (52 - 75), and the posttest score from MEAS is 64.21 ± 5.18 (52 - 73) when mean ± sd scores are taken into account. The Cronbach's Alpha value in the pretest from METSN 0.899; it is 0.925 in the posttest from METSN. The Cronbach's Alpha value in the pretest from MEAS 0.563; it is 0.634 in the posttest from MEAS.

No characteristics of the participants shown in Table 1 such as age group, gender, the place of the residence occupied over a long period, etc. made a difference regarding the group the participants were placed in ($p > 0.05$).

As can be seen in Table 2, a difference was found in the posttest score distributions for MTI, F, HI, and C sub-items of METSN in terms of the groups of the participants ($p < 0.05$). In this study, the posttest value of the sub-item for C, the pretest value of the sub-item of MEP, the posttest median values of the sub-item for MEA from METSN of the FFEG are higher in such a way to create a difference ($p < 0.05$). As for the values for the ITG, the posttest values for sub-items of falls, medication and transfusion implementations for METSN, the posttest value of the total score from MEAS and the posttest value of the sub-item for MEA are higher in a way to make a difference ($p < 0.05$). In the control group, no difference was found regarding both the total score of the scales used and their scores of sub-items ($p > 0.05$). Although it did not create a significant difference in the study ($p > 0.05$), it was observed that there was a higher increase in the posttest scores of the participants in ITG in comparison to their pretest scores from both METSN and MEAS.

Table 1. Distribution of some characteristics of the participants in accordance with the group they are placed in (N = 60)

	FFEG[a] (n = 20)		ITG[b] (n = 20)		CG[c] (n = 20)		
	n	**%***	**n**	**%***	**n**	**%***	
Age group							
Between 19-21 age	13	33.3	15	38.5	11	28.2	$\chi^2 = 1.758$
22 and above	7	33.3	5	23.8	9	42.9	p = 0.41
Gender							
Male	16	34.0	16	34.0	15	31.9	$\chi^2 = 0.196$
Woman	4	30.8	4	30.8	5	38.5	p = 0.90
Longest living area							
Rural area	5	38.5	3	23.1	5	38.5	$\chi^2 = 0.786$
Urban area	15	31.9	17	36.2	15	31.9	p = 0.67
Income perception							
Enough	13	37.1	9	25.7	13	37.1	$\chi^2 = 2.194$
Insufficient	7	28.0	11	44.0	7	28.0	p = 0.334
Do you have a habit of smoking, drinking alcohol, or hookah?							
Yes	5	38.5	5	38.5	3	23.1	$\chi^2 = 0.786$
No	15	31.9	15	31.9	17	36.2	p = 0.67
Does he have a chronic disease?							
Yes	0	0.0	2	100.0	0	0.0	$\chi^2 = 4.358$
No	20	35.1	17	29.8	20	35.1	p = 0.11
Is the profession your own choice?							
Yes	18	32.7	19	34.5	18	32.7	$\chi^2 = 0.436$
No	2	40.0	1	20.0	2	40.0	p = 0.80
Is he happy with his job?							
Yes	17	38.6	14	31.8	13	29.5	
No	0	0.0	1	33.3	2	66.7	$\chi^2 = 3.206$
No idea	3	23.0	5	38.5	5	38.5	p = 0.52
If he made a medical mistake, would he report it?							
Yes	19	32.8	19	32.8	20	34.5	$\chi^2 = 1.034$
No	1	50.0	1	50.0	0	0.0	p = 0.59
Would he report your friend's ME/M?							
Yes	18	31.6	19	33.3	20	35.1	$\chi^2 = 2.105$
No	2	66.7	1	33.3	0	0.0	p = 0.34

[a] *Face-to-Face Education Group;* [b] *Information Technology Group;* [c] *Control group*
** The line percentage was regarded.*

The state of difference between the total pretest and posttest scores of the participants from METSN and MEAS and some characteristics of participants is shown in Table 3. According to this, the pretest score of those deeming their income to be sufficient from MEAS is higher ($p < 0.05$). In the study, the posttest score from MEAS was found to be higher in those with a chronic disease and in those saying that they wouldn't report it if they committed a medical error ($p < 0.05$).

Table 2. Distribution of the pretest and posttest scores for METSN and MEAS in total and sub-items in terms of participants' groups (N=60)

Characteristics		FFEG[a] (n = 20) Mean ± SD or Mean Rank (Min-Max)	ITG[b] (n = 20) Mean ± SD or Mean Rank (Min-Max)	CG[c] (n = 20) Mean ± SD or Mean Rank (Min-Max)	Test value**
METSN[d]	Pre-test	222.00 (195.00-245.00)	220.00 (177.00-242.00)	222.00 (181.00-237.00)	KW = 3.510, p = 0.173
	Post-test	227.50 (196.00-244.00)	222.00 (178.00-242.00)	222.50 (190.00-237.00)	KW = 3.186, p = 0.203
Test*		Z = -0.906, p = 0.365	Z = -1.309, p = 0.191	Z = -0.561, p=0.575	
MTI[d1]	Pre-test	85.00 (74.00-90.00)	81.00 (63.00-90.00)	84.00 (57.00-88.00)	KW = 1.858, p = 0.395
	Post-test	84.50 (76.00-89.00)	83.00 (68.00-90.00)	83.00 (69.00-90.00)	KW = 7.705, **p = 0.201**
Test*		Z = -0.303, p = 0.762	Z = -2.601, **p = 0.009**	Z = -0.526, p = 0.599	
F[d2]	Pre-test	23.00 (15.00-25.00)	21.00 (18.00-25.00)	23.00 (13.00-25.00)	KW = 0.762, p = 0.683
	Post-test	23.00 (19.00-25.00)	23.00 (19.00-25.00)	23.00 (17.00-25.00)	KW = 6.712, **p = 0.035**
Test*		Z = -0.635, p = 0.526	Z = -2.071, **p = 0.038**	Z = -0.088, p = 0.930	
HI[d3]	Pre-test	56.50 (48.00-60.00)	54.00 (47.00-59.00)	55.00 (45.00-60.00)	KW = 0.563, p = 0.755
	Post-test	57.00 (48.00-60.00)	55.50 (46.00-60.00)	56.00 (43.00-60.00)	KW = 5.981, **p = 0.050**
Test*		Z = -0.674, p = 0.500	Z = -1.380, p = 0.168	Z = -0.172, p=0.864	
PM/MS[d4]	Pre-test	38.50 (30.00-45.00)	36.00 (27.00-45.00)	39.00 (27.00-45.00)	KW = 3.287, p = 0.193
	Post-test	39.50 (32.00-45.00)	38.00 (23.00-44.00)	38.00 (29.00-44.00)	KW = 3.874, p = 0.144
Test*		Z = -1.178, p=0.239	Z = -0.618, p=0.537	Z = -0.285, p = 0.775	
C[d5]	Pre-test	21.50 (5.00-25.00)	24.00 (16.00-25.00)	22.00 (5.00-25.00)	KW = 1.137, p = 0.566
	Post-test	24.00 (19.00-25.00)	24.00 (8.00-25.00)	23.00 (12.00-25.00)	KW = 10.35, **p = 0.006**
Test*		Z = -2.545, **p = 0.011**	Z=-0.929, p = 0.353	Z = -1.575, p=0.115	
MEAS[e]	Pre-test	61.80 ± 5.86	61.90 ± 5.37	62.49 ± 4.18	F = 1.674, p = 0.197
	Post-test	64.70 ± 3.97	64.45 ± 5.14	63.50 ± 6.36	F = 0.291, p = 0.749
Test*		t = -1.962, p = 0.065	t =- 3.422, **p=0.003**	t = 0.836, p = 0.414	
MEP[e1]	Pre-test	6.20 ± 1.36	6.15 ± 1.59	5.80±1.36	F =0 .455, p = 0.637
	Post-test	5.35 ± 1.26	5.95 ± 1.76	5.80±1.39	F = 0.877, p = 0.421
Test*		t = 2.429, **p = 0.025**	t = 0.940, p = 0.359	t = 0.000, p = 1.000	
MEA[e2]	Pre-test	28.05 ± 3.51	28.85 ± 3.21	29.65 ± 2.77	F = 1.262, p = 0.291
	Post-test	29.90 ± 2.12	30.05 ± 2.35	28.85 ± 2.99	F = 1.349, p = 0.268
Test**		t = -2.325, **p = 0.031**	t = -2.108, **p = 0.049**	t = 1.228, p = 0.234	
RME[e3]	Pre-test	27.55 ± 3.06	26.90 ± 3.00	29.00 ± 3.17	F = 2.428, p = 0.097
	Post-test	29.45 ± 2.87	28.45 ± 3.08	28.85 ± 4.23	F = 0.426, p = 0.655
Test*		t = -2.027, p=0.057	t = -2.153, **p = 0.044**	t = 0.183, p = 0.857	

[a] Face-to-Face Education Group, [b] Information Technology Group, [c] Control group,
[d] Medical Error Tendency Scale for Nurses; [d1]Medication and Transfusion Implementations', [d2]Falls, [d3]Hospital Infections, [d4]Patient Monitoring/Material Safety, [d5]Communication;
[e] Medical Error Attitude Scale, [e1]Medical Error Perception, [e2]Medical Error Attitude, [e3]Reasons for Medical Error,
*Paired-Samples T-test / Wilcoxon Signed Ranks test, **One-Way ANOVA / KW: Kruskall Wallis test

Table 3. Distribution of the pretest and posttest scores of the participants from METSN and MEAS in terms of some of the participants' characteristics (N=60)

Characteristics	METSN[a] Pretest Mean ± SD / Mean Rank	METSN[a] Posttest Mean ± SD / Mean Rank	MEAS[b] Pretest Mean ± SD / Mean Rank	MEAS[b] Posttest Mean ± SD / Mean Rank
Income perception				
Enough	31.26	32.63	63.91 ± 5.61	65.31 ± 4.89
Insufficient	29.44	27.52	61.04 ± 4.24	62.68 ± 5.28
Test*	U = 411.00, p = 0.691	U = 363.00, p = 0.264	t=2.256, **p=0.028**	t = 49.336, p = 0.056
Does he have a chronic disease?				
Yes	27.75	34.25	65.50 ± 4.94	72.00 ± 1.41
No	30.08	29.85	62.66 ± 5.30	63.89 ± 5.09
Test*	U = 52.50, p = 0.852	U = 48.50, p = 0.731	t = 0.794, p = 0.565	t = 6.720, **p = 0.019**
If he made a medical mistake, would he report it?				
Yes	30.53	30.31	62.55±5.22	64.12±5.25
No	29.75	36.00	67.50±4.94	67.00±0.00
Test*	U = 56.50, p = 0.950	U=47.00, p=0.678	t=-1.319, p=0.385	t=-4.175, **p=0.001**

[a]Medical Error Tendency Scale for Nurses, [b]Medical Error Attitude Scale, **t: Independent Samples T-test/U: Mann-Whitney U Test, F: One-Way ANOVA*

The relationship between the total pretest and posttest scores of the participants from METSN and MEAS is shown in Table 4. a positive, moderate relationship was found between the pretest and posttest scores from both scales ($p < 0.05$).

Table 4. The Relationship between the total pretest and posttest scores of participants from METSN and MEAS (N=60) *

		METSN[a] Pretest	METSN[a] Posttest	MEAS[b] Pretest	MEAS[b] Posttest
METSN Pretest	**Rho**	1			
	p	-			
METSN Posttest	**Rho**	0.437**	1		
	p	**0.001**	-		
MEAS Pretest	**Rho**	-0.133	-0.172	1	
	p	0.310	0.190	-	
MEAS Posttest	**Rho**	-0.069	0.023	0.472**	1
	p	0.601	0.859	**0.001**	-

[a] Medical Error Tendency Scale for Nurses, [b] Medical Error Attitude Scale

** Spearman correlation analysis was implemented.*

4. Discussion

There were two objectives in this study with a pretest-posttest comparison and with the randomized-controlled trial method, the first of which was to determine whether any difference emerged between participants' scores from METSN and MEAS in terms of the methods employed in the intervention. The second objective of the study was to determine whether the desired characteristics created any difference in the scores from METSN and MEAS. The result that primarily attracts attention in the study is the attitudes of the participants regarding the reasons for ME / M. The participants specified among the top three reasons inexperience in the hospital, stress, and lack of knowledge, and they indicated among the lowest three reasons the long periods of working and presence of excessive protocols-procedures regarding implementations/incomprehensibility of protocols-procedures, not paying attention to shift changes and dissatisfaction with the administrator. In the study carried out by In the literature, while excessive workload, exhaustion and lack of communication were found to be the reasons that most cause ME / M; absence of on-the-job training, dislike-negligence of the profession and administrative problems were reported to be the last three reasons that cause ME / M [18-21].

The second conclusion of the study is that the methods employed in intervention do not make a difference in the total scores from METSN and MEAS. However, it was observed that a difference emerged in scores in the items of communication, ME perception, and ME attitude in the face-to-face education group. It was found that a difference emerged in the sub-items of medication and transfusion implementations, falls, the total score from MEAS, and MEA sub-dimensions in the group where Whatsapp and Messenger were used as the information technology. On the other hand, the situation regarded as significant is the excess of the proportional increase in the posttest scores of the participants in ITG from METSN and MEAS. In a study by Sezer et al where whether online and traditional methods create any difference in on-the-job training is assessed, it was reported that the posttest scores of the intervention group rose in a similar way to those in this study [22]. In one study, 500 obstetricians and 500 pediatricians were asked whether they gave any recommendation to their patients regarding the consumption of chicken products. This study not only reveals the impact of traditional communication tools once again but also the fact that doctors have been opting for the Internet and social media tools in getting information and that they regard these tools as important references with respect to treatment options [23].

The third result of the study is that among the desired characteristics, perception of income level, the state of chronic illness, and variables regarding reporting of ME/M in case of the commitment of these create a difference in terms of METSN and MEAS. Socio-demographic characteristics assessed in the study conducted by Guven et al [24]. Through cooperation with volunteering nurses working in a state hospital did not create any difference in terms of ME / M attitude. In the study by Ozen et al., the score averages in those at the age of 31 and over and in women from METSN were found to be high enough to create a difference [18]. In another study was reported that total score averages and the score averages from some sub-items from METSN were higher in women, in those that deemed their income to be insufficient and in those dissatisfied with their jobs [25]. The reason for the differences has been considered to be the fact that the sampling group was working.

The last finding of the study is the result of intervention methods for pretest and posttest scores. It was observed that the score values of the participants regarding ME / M tendencies and attitudes after the interventions implemented increased positively and moderately. This situation has been interpreted

in such a way that it is thought that updates and reinforcements of information for individuals to increase ME/M tendency and attitude are beneficial. The use of web-based networks has been explained as pedagogical tools in the literature and it has been stated that the educational use of such tools will be beneficial [26-28]. The finding that comes before us in observations in our day regarding this age group is that the source of information for those that continue their daily lives in the allure of social media is now the digital world. Therefore, the result is attention-grabbing. It is deemed that the awareness-raising regarding health education or implementations rendered in general through information technologies will be convenient.

5. Conclusions

In this study where whether face-to-face education methods and methods of education through information technologies make a difference in ME/M tendency and attitude was assessed, and it was found that there was no difference between both intervention methods in terms of efficiency. ME / M tendency decreased and levels of positive attitude increased after both intervention methods. None of the socio-demographic characteristics made a difference in the total scores for tendency and attitude; however, some of them made a difference in sub-item scores. It will be beneficial to re-conduct this study both on other samples and in various disciplines providing health services.

Ethical Statement: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

This study is approved by Bingöl University Ethics Committee (92342550/044;19.06.2019).

Funding sources: The work did not receive any other grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of Conflict Interest: The authors declare no further conflicts of interest. For any conflicts of interest outside the submitted work, all authors filled in the ICMJE form that is available upon request.

Acknowledgments: We thank all of the participants.

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INESEG
INTERNATIONAL ENGINEERING SCIENCE AND EDUCATION GROUP

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

e-ISSN: 2602-3482

IJHSRP

Research Article

EVALUATION OF SLEEP QUALITY WITH BURNOUT LEVEL IN EMERGENCY MEDICAL ASSISTANTS

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Abstract: *Burnout syndrome is a condition in which people work in professions that require face-to-face communication and prolonged stress and personal copying methods fail. Healthcare professionals are one of the riskiest occupational groups in terms of burnout syndrome due to their heavy workload. Intense and stressful conditions reduce the joy and productivity of healthcare professionals. In this study, our primary aim is to evaluate the relationship between burnout level and sleep quality in emergency medicine assistants (EMA). This study is a descriptive and cross-sectional study. According to the data obtained from the Higher Education Board, the personal information form and Maslach Burnout Inventory (MBI) and Pittsburgh Sleep Quality Index (PSQI) surveys were sent to all emergency assistants receiving training in Turkey. A total of 94 people working as emergency medical assistants participated in our study. According to the MBI subgroup emotional exhaustion, 84% (n= 79) of the participants had a high level of emotional exhaustion and 16% (15) had moderate emotional exhaustion. When the MBI subgroup desensitization was evaluated, 87.2% (n= 82) was found high and 12.8% (n= 12) was found moderate. When the personal success of the MBI subgroup was evaluated, 97.9% (n= 92) was found low and 2.1% (n= 2) was found moderate. When the correlation between the MBI subgroups and the PSQI scoring was evaluated, a moderate positive correlation was found between emotional exhaustion and PSQI ($p \leq 0.001$). When the sleep quality with MBI is evaluated by regression analysis, it is seen that the state of exhaustion affects the quality of sleep by 13.1%. A high level of burnout during the education period of the emergency medicine assistant causes sleep quality deterioration. This situation causes difficulties in business and private life over time. We think that it will be beneficial to regulate the monthly working hours in order to decrease the burnout levels and increase sleep quality for keeping EMAs physically and mentally healthy, to increase the training staff to make them feel safe, and to organize programs to increase non-work social activities.*

Keywords: *Maslach Burnout Inventory, Sleep Quality, Emergency Medical Assistants*

Received: April 1, 2020 Accepted: May 29, 2020

1. Introduction

Burnout syndrome is a condition in which people work in professions that require face-to-face communication and prolonged stress and personal coping methods fail [1]. The concept of burnout, which was defined for the first time in 1974, was defined as emotional exhaustion due to the inability to fulfill their occupational requirements as a result of long working hours [2]. Healthcare professionals are one of the riskiest occupational groups in terms of burnout syndrome due to their heavy workload.

Intense and stressful conditions reduce the joy and productivity of healthcare professionals [3]. In addition to the workload, the need to provide emotional support, providing care for severe and deadly patients, disturbed sleep patterns, and the high number of duties increase burnout in major stressors on healthcare professionals [4,5]. In addition to the stressful environment in the workplace, an irregular social life prepares the ground for the burnout of Emergency personnel over time [6].

Sleep is one of the basic requirements and it should be regular so that people can be healthy physically and mentally [7, 8]. Sleep helps the body rest and enable correction and repair of brain functions. The quality of sleep, which is an important aspect of this biological process that provides body renewal, is that the individual feels fit and fit after awakening [9]. The circadian rhythm is the cycle in which the human body actively continues its vital activities during the 24-hour day in the period of sunlight, and passes to sleep rhythm more passively after sunset. Disruption of this rhythm leads to poor quality of sleep and sleep disorders [10]. Inadequate sleep resulting from the working patterns and departments of healthcare professionals causes sleep disorders [11, 12].

According to two different studies by Maslach et al. on burnout syndrome, there are three main factors related to this syndrome. These are divided into three sub-categories as emotional burnout, desensitization, and personal accomplishment [2, 13]. Working with a shift and duty systems may cause physiological and/or psychological health problems after a while as it contradicts the biological rhythm of the person [13, 14]. In the literature, it has been reported in studies related to nurses that the state of burnout arising from the disruption of the circadian rhythm increases [15, 16].

Sleep rhythm and sleep quality are seen in normal people deteriorate due to the working patterns with shifts and duties [17, 18, 19]. The duration of the emergency medicine assistantship training is 4 years, and it is a difficult process. During this period, it causes sleep disorders. In this study, our primary aim is to evaluate the relationship between burnout level and sleep quality in emergency medical assistants.

2. Method

2.1. Study Design

This study is a descriptive and cross-sectional study. Approval was obtained from the local ethics committee for the study. Our study was conducted between 1.12.2019-31.12.2019. According to the data obtained from the Higher Education Board, the personal information form and Maslach Burnout Inventory (MBI) and Pittsburgh Sleep Quality Index (PSQI) surveys were delivered to all emergency assistants who receive training in Turkey. The questionnaire forms were sent via e-mail. According to the data obtained from the Higher Education Information system, the universe of the study was determined as 705 emergency medical assistants [20]. Power analysis was applied to determine the appropriate sample size. Accordingly, the sample size of this study was calculated to be 83 individuals with an effect of 0.50, a power of 85%, and an error of 0.05 α. Participants who received emergency medicine training were included in the study. A total of 94 people working as emergency medical assistants participated in our study. Participants were grouped according to age, marital status, sex, number of children, year of assistantship, occupational year, monthly working hours, educational staff, type of hospital worked, and number of patients applying to the emergency department.

Ethics declaration: This study was approved by the Ethics Committee of Yozgat Bozok University on 30.10.2019 with the decision of 2017-KAEK-189_2919.189.10.30_24. Our study was carried out in

accordance with the Helsinki Declaration. The study is voluntary and permission has been obtained from the participants.

2.2. Scales Used

2.2.1 Maslach Burnout Inventory (MBI)

Maslach Burnout Inventory was created by Maslach and Jackson and consists of 22 items. The inventory has sub-dimensions of emotional exhaustion, personal success, and desensitization. Emotional exhaustion is defined as the feeling of being overloaded and depleted due to the work of the person. Desensitization is a situation related to the attitude and behavior of the person devoid of emotion towards their care and service. Personal success, on the other hand, is defined as overcoming the problems and finding oneself self-sufficient [21]. It was adapted to Turkish by Ergin in 1992. He arranged the answers to the questions in a 5-point likert in accordance with the Turkish society [22]. 5-point scale (0 = never, 1 = very rarely, 2 = sometimes, 3 = usually, 4 = always) was shaped according to Turkish culture.

Scoring between 0 and 16 from the emotional burnout subscale indicates low burnout, scoring between 17 and 26 indicates moderate burnout, and scoring 27 and above indicates high burnout. Scoring 0-6 from the burnout subscale of desensitization indicates low burnout, scoring 7-12 indicates moderate and scoring 13 and higher indicates high burnout. Scoring 39 and above from the burnout subscale in the form of personal success indicates low burnout, scoring between 32-38 points indicates moderate, and scoring up to 0-31 points shows high levels of burnout. In our study, the reliability coefficient of the MBI was calculated with Cronbach Alpha and was found 0.775.

2.2.2 Pittsburgh Sleep Quality Index (PSQI)

PSQI was developed by Buysse et al. (1989) and has been shown to have sufficient internal consistency (Cronbach's alpha= 0.80), test-retest reliability and validity [23, 24]. The validity and reliability study of PSQI in our country was performed by Ağargün et al. (1996) (Cronbach's alpha = 0.80) [24]. PSQI consists of 7 components: subjective sleep quality (component 1), sleep latency (component 2), sleep time (component 3), habitual sleep efficiency (component 4), sleep disorder (component 5), use of sleeping medicine (component 6) and daytime dysfunction (component 7). The sum of the seven component points gives the total PSQI score. The response of each is scored between 0-3 according to the frequency of the symptoms. The scale has a total score between 0-21. A total scale score between 0-4 points indicates good sleep quality, and between 5-21 points means bad sleep quality. In our study, the reliability coefficient of the PSQI was calculated with Cronbach's Alpha and was found at 0.76.

2.2.3 Statistical Analysis

All statistical data were analyzed by SPSS 20.0 for Windows. Kolmogorov-Smirnov test and skewness-kurtosis method were used to evaluate the normal distribution of all variables. In addition, the normal distribution of the data was evaluated with the histogram as one of the graphical methods. Descriptive statistics were used in the demographic examination of the patients. When evaluating the data in the study, the Chi-square test was applied if it was qualitative. In the evaluation of the study data, numerical values are expressed as mean ± standard deviation. In the comparison of the numerical

changes between variables that are statistically parametric and the data obtained by the study carried out within the scope of clinical research, student's t-test and non-parametric characteristics, according to the categorical (nominal or ordinal), numerical independent group of the established variables, Kruskal-Wallis H test, and Mann-Whitney U test was used. For correlations between data, the Pearson rank correlation method was used in parametric data and Spearman rank correlation method was used in non-parametric data. The linear regression method was used to evaluate the effect of sleep quality on MBI subgroups. A p value less than 0.05 has been accepted statistically significant.

3. Results

A total of 94 people working as emergency medical assistants participated in our study. The mean age of the male participants in the study was 29.08±3.03, and the mean age of the female participants was 29.2±3.4. There was no statistically significant difference between the mean ages of the participants (t: -0.006; p= 0.513). 59.1% (n= 59) of the participants were male and 40.9% (n= 35) were female. The sex difference of the participants was found to be statistically significant (x^2: 49.809; p≤0.001). According to the marital status of the participants, 64.9% (n= 61) were married and 35.1% (n= 33) were single. When the number of children of the participants was evaluated, 60.6% (n= 57) had 0 children, 37.3% (n = 35) had 1 child, 2.1% (n= 2) 2 or more children.

When the monthly working hours of the participants were evaluated, 44.7% (n= 41) reported that they worked 241 hours or more, 30.9% (n= 29) 217-240 hours, 17% (n= 16) 193-216 hours, 7.4% (n= 7) 192 and below. When the participants' years of work in the profession were evaluated, 54.7% (n= 54) had been working 0-4 years, 29.8% (n= 28) 5-9 years, and 12.8% (n= 12) 10-14 years. When the emergency assistantship period of the participants was evaluated, 37.2% (n= 35) were first year assistants, 23.4% (n= 22) second year assistants, 18.1% (n= 17) were third year assistants, and 21.3% (n=20) were fourth year assistants.

When the number of monthly patient admissions in the places where the participants work is evaluated, 42.6% (n= 40) had 500-1000, 20.2% (n= 19) had 250-500, 16.2% (n= 15) had 100-249, 9.6% (n= 9) had 1000-1500, 9.6% (n= 9) had 1501-2000, 2.1% (n= 2) had 50-100 patient admissions. When the types of hospital the participants worked at were evaluated, 51.1% (n= 48) were employed at Education Research Hospital (ERH), 48.9% (n= 46) in the university hospital. There was no statistically significant difference according to the hospital type of the participants (x2: 0.043, p= 0.837).

According to the MBI subgroup emotional exhaustion, 84% (n= 79) of the participants had a high level of emotional exhaustion and 16% (15) had moderate emotional exhaustion. When the MBI subgroup desensitization was evaluated, 87.2% (n= 82) was found high and 12.8% (n= 12) was found moderate. When the personal success of the MBI subgroup was evaluated, 97.9% (n= 92) was found low and 2.1% (n= 2) was found moderate. When the whole MBI was evaluated, 92.6% (n=87) were found at a high, and 7.4% (n=7) at a moderate level. The mean scores of emotional exhaustion scores of the participants were 31.8 ± 5.07, the desensitization of the subgroups was 17.9 ± 3.7, and the mean score of personal achievement was 24.5 ± 3.6.

When the MBI subgroup scores were compared according to the demographic characteristics of the participants, no significant relationship was found between age groups, sex, and the sub-dimensions of the MBI (p> 0.005) (Table 1).

When the marital status of the participants was evaluated in the MBI, no statistically significant difference was found in the emotional exhaustion subgroup (p> 0.05). A statistically significant difference was found between marital status groups in desensitization and personal success among the subgroups of MBI (p = 0.044; p = 0.032). When the MBI was evaluated according to the number of children of the participants, a statistically significant difference was found in desensitization and personal achievement subgroup (p= 0.048; p= 0.049) (Table 1).

Table 1. Socio-demographic data of the participants and distribution of MBI subgroups

Groups		**Percent/N**	**EE (Mean±Sd)**	**DS(Mean±Sd)**	**PS(Mean±Sd)**
Age groups	24-25 age	%8.5(8)	29.5±2.8	18.4±4.4	22.3±3.2
	26-27 age	%25.5(25)	32.7±4.6	17.3±3.9	25±3.4
	28-29 age	%30.9(29)	32.3±4.5	17.7±3.7	24.3±3.5
	30 and older	%35.1(33)	31.3±6	18.6±3.3	24.8±3.9
K.W.H. T(p value)			0.282[b]	0.407[b]	0.356[b]
Gender	Female	%40.9(35)	31.6±5.1	17.08±3.2	24.9±3.8
	Male	%59.1(59)	32.01±5.09	18.01±4.04	24.3±3.4
M.W. U.T(p-value)			0.376[b]	0.365[b]	0.562[b]
Marital Status	Married	%64.9(61)	31.5±5.2	17.3±3.6	24±3.4
	Single	%35.1(33)	32.4±4.8	19±3.7	25.6±3.8
M.W. U.T(p-value)			0.597[b]	0.044[a]	0.032[a]
Number of children	0 child	%60.6(57)	32.7±4.6	18.6±3.6	25.3±3.4
	1 child	%37.3(35)	30.8±5.2	16.9±3.6	23.4±3.6
	2 children	%2.1(2)	26±8.4	17±5.6	23±1.4
K.W.H.T(p-value)			0.137[b]	0.048[a]	0.049[a]

K.W.H.T.= Kruskal Wallis H Test, M.W. U.T=Mann-Whitney U Test,EE=Emotional Exhaustion,DS= Desensitization,PS=Personal Success "a"=significance level of p < 0.05, "b"= > 0.05 is not significant.

As shown in Table 2, when the MBI was evaluated according to the monthly working hours of the participants, a statistically significant difference was found in the subgroups of emotional exhaustion, desensitization and personal success (p <0.05) (Table 3). When the subgroups of MBI were evaluated according to the participants' year of assistantship, there was no statistically significant relationship between the groups (p> 0.05). Although there was a statistically significant difference in emotional exhaustion among the subgroups of the MBI according to the participants' year of work (p = 0.041), there was no statistically significant difference in the desensitization and personal success subgroups (p>0.05). (Table 2).

Table 2. Distribution of MBI subgroups according to the study variables of the participants

Study Type Variables		Percent/Nm	EE (Mean±Sd)	DS(Mean±Sd)	PS(Mean±Sd)
Monthly working hours	192 and below	%7.4(7)	30.7±4.8	17.1±3.6	23.7±3.6
	Between 193-216	%17(16)	32±5.3	17.2±3.8	23.2±3.8
	Between 217-240	%30.9(29)	31.7±5.2	18±3.2	24.5±3.4
	241 and above	%44.7(41)	33.5±4.7	19.3±3.3	25.9±3.1
K.W.H.T(p-value)			0.042[a]	0.01[a]	0.023[a]
Year of employment in the profession	0-4 year	%54.7(54)	32.5±4.3	18.2±3.4	24.9±3.7
	5-9 year	%29.8(28)	31.6±6.06	18.2±3.7	24.5±3.6
	10 -14 year	%12.8(12)	30.08±5.5	16±4.1	23.9±3.4
K.W.H.T(p-value)			0.041[a]	0.390[b]	0.813[b]
Assistant education year	1 year	%37.2(35)	32.7±3.8	18.2±3.7	24.7±3.2
	2 year	%23.4(22)	32.1±4.1	17.7±4.6	24.7±3.8
	3 year	%18.1(17)	30.1±5.7	18.1±3.3	23.8±3.7
	4 year	%21.3(20)	31.06±5.7	17.2±2.8	24.7±3.1
K.W.H.T(p-value)			0.270[b]	0.596[b]	0.959[b]

K.W.H.T.= Kruskal Wallis H Test, M.W. U.T=Mann-Whitney U Test,EE=Emotional Exhaustion,DS= Desensitization,PS=Personal Success "a"=significance level of p < 0.05, "b"= > 0.05 is not significant.

When the subgroups of MBI were evaluated according to the hospital where the participants in the study worked, there was no statistically significant relationship in all three subgroups (p> 0.05) (Table 3). There was no statistically significant difference in the number of patients entering the emergency department in the hospitals where (emergency medicine assistant) EMAs participated in the study (P>0.05). When the MBI subgroups of the participants in the study were evaluated according to the teaching staff, there was a statistically significant difference in the desensitization and personal success subgroups (p <0.05). No statistically significant difference was found in the emotional exhaustion subgroup (p>0.05) (Table 3).

When the correlations of the MBI subgroups according to the year of employment and monthly working hours are evaluated, there was a moderate negative relationship between the year of work in the profession and emotional exhaustion (r: 0.560; p = 0.040). There was no positive or negative correlation between the year of work in the profession and the desensitization and personal success among the MBI subgroups (p> 0.05). A moderate positive correlation was found between monthly working hours and emotional exhaustion (r: 0.429; p= 0.011). A moderately significant positive correlation was found with desensitization among subgroups (r: 0.321; p≤0.01). A moderate negative correlation was found between personal success and monthly work (r:-0.315; p= 0.02).

Table 3. Hospital Characteristics of the Participants and the relationship between MBI subgroups

Hospital Characteristics			**EE (Mean±Sd)**	**DS(Mean±Sd)**	**PS(Mean±Sd)**
Hospital type studied	University Hospital	%48.9	32.17±5.2	17.7±3.5	24.8±3.7
	Education Research Hospital	%51.1	32.6±4.9	18.1±3.8	24.3±3.6
Student t(p-value)			0.589[b]	0.658[b]	0.552[b]
Education Staff	1 Faculty Member	%9.6	33.4±5.5	19.04±2.3	25.8±2.8
	2 Faculty Member	%7.4	33.2±4.2	18.7±3.7	25.38±3.8
	3 Faculty Member	% 25.3	31.2±4.1	17.91±3.8	24.5±3.7
	4 Faculty Member	%19.1	30.7±4.6	17.8±4.4	23.4±3.6
	5 Faculty Member	%38.3	28.6±4.3	13.7±3.5	21.8±2.3
K.W.H.T(p value)			0.097[b]	0.015[a]	0.09[a]
K.W.H.T.= Kruskal Wallis H Test, EE=Emotional Exhaustion,DS= Desensitization,PS=Personal Success "a"=significance level of p < 0.05, "b"= > 0.05 is not significant.					

When the 7 component of sleep quality was evaluated, the mean score of component 1 was 2.9 ± 0.7, component 2 mean was 2.96 ± 0.9, component 3 mean was 6 ± 1.8, component 4 mean was 0.6 ± 1.3, component 5 mean was 2 ± 2.07, component 6 mean was 0.2 ± 0.7, and component 7 mean was 2.1 ± 1.13. The total PSQI mean score of the participants in the study was 17.04 ± 3.08 (Table 4).

Table 4. Average of the Sleep Quality Components of the Participants

Sleep Quality Components	Mean±Sd
Subjective Sleep Quality (Component 1)	2.9±0.7
Sleep Latency (Component 2)	2.96±0.9
Sleep Time (Component 3)	6±1.8
Conventional Sleep Activity (Component 4)	0.6±1.3
Sleep Disorder (Component 5)	2±2.07
Sleeping Drug Use (Component 6)	0.2±0.7
Daytime Dysfunction (Component 7)	2.1±1.13
The total PSQI mean score	17.04 ± 3.08

When PSQI mean scores were compared, there was no statistically significant difference between the socio-demographic characteristics of the participants in terms of age, marital status, number of children, and sex factors ($p > 0.05$).

When the PSQI scores of the participants were evaluated according to the assistantship year and the year of work in the profession, there was no statistically significant difference ($p > 0.005$). When the groups were evaluated according to their monthly working hours, there was a statistically significant difference in the PSQI score of the participants (χ^2: 8.223, $p = 0.042$).

When the PSQI score was evaluated according to the teaching staff of the participants in the study, there was no statistically significant difference between the groups ($p=0.084$). When the groups were evaluated according to the type of hospital where the participants worked, there was no statistically significant difference ($p= 0.464$). When grouped according to the number of daily patient admissions to the hospitals where they worked, there was a statistically significant difference between PSQI scores ($p= 0.044$).

When the correlation between the MBI subgroups and the PSQI scoring was evaluated, a moderate positive correlation was found between emotional exhaustion and PSQI ($p\leq0.001$). However, when the PSQI score was evaluated with the desensitization and personal success subgroups in the MBI, there was no positive or negative relationship ($p= 0.103$, $p=0.341$) (Table 5). When the sleep quality with MBI is evaluated by regression analysis, it is seen that the state of exhaustion affects the quality of sleep by 13.1%. Especially emotional exhaustion has a positive significant correlation. ($P\leq0.001$) As emotional exhaustion increases, sleep quality deteriorates.

Table 5. Correlation of Sleep Quality with the MBI subgroups of the participants

MBE Subgroups	Coerr.Coeff.	P-value
Emotional exhaustion	0.347	≤0.001*
Desensitization	0.169	0.103
Personal Success	0.099	0.341
* significance level of $p < 0.05$		

4. Discussion

Examining the burnout syndrome, which closely affects the lives of healthcare workers, is important in terms of preventing the problem [26]. The most important consequence of burnout is presented as the deterioration in the quality and quantity of the service provided, but it also causes serious physical and mental problems on individuals [27]. Emergency workers are constantly under stress due to critical patient care, work intensity, and the pace of work in shifts [28]. Among the factors that increase the burnout status during the emergency medicine assistant (EMA) training are long working hours and emergency patient density. However, sudden death cases cause instant mood changes. Stress factors increase and sleep disturbances occur due to the ongoing communication with other branches in patient admissions and consultation procedures.

It was reported that the burnout levels of gynecology and obstetric assistants performed in 2015 were 44%, and in a different study conducted with emergency service employees in 2015, the burnout status was 57.1% [29,30]. According to the results of our study, burnout levels were found high with 92.6% and they differed from the results of these studies. It is seen that EMAs with high burnout levels are not affected by variables such as sex and age whereas we see changes in desensitization and personal success scores as the number of children increase in the marital status and number of children groups. This situation gives rise to thoughts that EMAs, who have child responsibilities outside the hospital in their nonworking time, have decreased burnout due to the change in the areas of interests and socialization.

According to the results of our study, the scores of the MBI subgroups decrease as the year of work increases in the profession. Similar to our study, some studies have reported that burnout decreases as the working year increases [31,32]. According to these results, we believe that the physicians have a lack of experience in dealing with stressor factors in the first years of their career.

In the literature, in a study conducted with family doctor assistants, it was reported that burnout was higher in the first year assistant [33]. In another study conducted with plastic surgery assistants, it was reported that burnout status was high among first-year assistants [34].In our study, the difference between the groups was not statistically significant, although the MBI subgroups were high in 1st-year assistants. Unlike emergency medicine education, the number of duties decreases as the duration of education decreases in other assistant training. In emergency medicine assistantship, the work system of duties and shifts continues throughout the entire assistantship training. We believe that there is no difference between the years of education since EMAs continue to be dynamic from the 1st to the 4th year of the assistantship.

In the study conducted by Esen et al. with family doctors, it was reported that the burnout levels increased as the working hours increased [3]. Similarly, in our study, as the monthly working hours increase, the level of burnout increases. These results suggest that due to the increase in working hours, the level of burnout increases as the time allocated for themselves decreases. Ersoy et al. in their study with EMAs, reported that burnout levels differed according to the type of hospital worked at [35]. In our study, unlike theirs, burnout levels do not differ according to the type of hospital. In addition, when the burnout levels are evaluated according to the training staff in the studied hospital, the desensitization in their subgroups decreases as the training staff increases, however, the personal accomplishment subgroup scores increase as the training staff increases. It was concluded that the high number of training staff increased the personal accomplishment and confidence of EMAs while decreasing desensitization, and that receiving training in their intensive emergency service working life improved motivation.

It was concluded that 100% of EMAs participating in the study had poor sleep quality according to their PSQI scores. In a study conducted in the literature, daytime healthcare workers were found to have better sleep quality than shift workers [36]. In other studies conducted in the literature, it was reported that sleep quality was negatively affected in the work system with shifts and duties [37,38,39]. The results obtained in our study were similar to the data in the literature, and it was concluded that, due to the principle of working with shifts or 24-hour duties in emergency departments, EMA experienced disrupted circadian sleep rhythms in this work pattern.

In our study, unlike previous studies, sleep quality is not affected by factors of sex, marital status, and the number of children [40,41]. We think that the sleep quality is poor in the profession and emergency medicine training since its beginning and this situation does not change over the years, because the poor sleep quality starts to occur during the medical school years in the difficult training period. The increase in monthly working hours worsens sleep quality. It is observed that the quality of sleep is impaired in the places where the number of patients in the hospitals, where EMAs work, is high. In our opinion, this results from the fact that the pre-duty stress factors increased due to the previous experiences of EMAs, and their sleep quality deteriorated.

According to the results of our study, sleep quality deteriorates as emotional exhaustion increases. This supports the results obtained in previous studies [42,43]. However, the difference between these studies and ours is the presence of no correlation between desensitization and sleep quality in our study. As the reason for this difference, it was concluded that the participants experienced different emotions due to the difference in the profession group and sample of the studies. Emotional exhaustion from the burnout inventory affects the quality of sleep at the level of 13.1%. Especially when emotional exhaustion increases, it is seen that sleep quality will also be affected badly.

Limitation in our study; Burnout syndrome can be affected by many factors. The limitation of our study is that we do not question the chronic diseases of the participants' socio-demographic characteristics.

5. Conclusion and Recommendations

A high level of burnout during the training period of the emergency medicine assistants causes sleep quality deterioration. This causes difficulties in work and private lives over time. The increase in monthly working hours and the difference in social lives increase burnout and sleep quality impairment. The low number of training staff reduces the sense of personal accomplishment and

increases desensitization. We think that it will be beneficial to regulate the monthly working hours in order to decrease the burnout levels and increase sleep quality for keeping EMAs physically and mentally healthy, to increase the number of the training staff to make them feel safe, and to organize programs to increase non-work social activities.

Ethics declaration

This study was approved by the Ethics Committee of Yozgat Bozok University on 30.10.2019 with the decision of 2017-KAEK-189_2919.189.10.30_24.

The study was carried out in accordance with the Helsinki Declaration. The study is voluntary and permission has been obtained from the participants.

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

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

e-ISSN: 2602-3482

IJHSRP

Research Article

EVALUATION OF CLINICAL USE HABITS OF TUMOR MARKER TESTS

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Abstract: *Tumor markers (TMs) result from the re-expression of substances by embryologically related tissues. Many are found in different tumors of the same tissue. Therefore, they have low specificity and are not sufficiently sensitive as a screening test. The aim of this study is to evaluate the TM requesting habits of clinicians in Usak Training and Research Hospital, and the appropriateness of the test requests with the diagnosis. Data of 6998 serum TMs requested from 6531 patients between May 1 and July 31, 2019, were obtained from Laboratory Information System and grouped as sex, age, disease diagnoses, and multiple requests (more than 3 tests simultaneously). Compliance with the diagnosis was evaluated as appropriate or inappropriate based on published guidelines for indications for TM requests. Most TMs were made in the 50-70 age range (48.3%). Multiple TMs were mostly demanded from the Obstetrics and Gynecology Clinic with the diagnosis of menstrual irregularity. Also, 1078 of 1408 total PSA and 28 of 191 free PSA tests were requested with appropriate pre-diagnosis. This study is an example of the use of data mining for the conformity assessment purposes of the TM requests. Accordingly, it was found that the TMs were often incompatible with the diagnosis and were used for general screening purposes. In order to minimize misuse, evidence-based indicators should be developed and clinician awareness should be increased by creating test request algorithms that support the diagnosis.*

Keywords: *Tumor marker, test request, appropriateness*

Received: February 22, 2020 Accepted: June 18, 2020

1. Introduction

The disease that leads to deterioration of body functions by the uncontrolled growth, proliferation, or spread of a cell to surrounding tissues is called cancer. Cancer is a public health problem, and it is the leading cause of death worldwide. Each year, the costs of cancer diagnosis, treatment, and care constitute an important part of the national economic burden [1]. Tumor markers can use for diagnosis of cancer disease, determination of prognosis, monitoring of the treatment process. These markers can analyze from blood, urine, feces, and body fluids [2].

An ideal tumor marker should [3]; (a) be highly specific to a given tumor type; (b) provide a lead-time over clinical diagnosis; (c) be highly sensitive to avoid false-positive results. Additionally, (d) the levels of the marker should correlate reliably with the tumor mass, accurately reflecting any tumor progression or regression, along with a short half-life allowing frequent serial measurements. (e) The

test used for detection should be cheap for screening applications at the mass level and should be of such nature as to be acceptable to the target population. (f) It should not be detected healthy individual's body and in benign conditions or measured at much lower levels than in cancer cases. In reality, an ideal tumor marker does not exist according to this.

Tumor markers (TMs) result from the re-expression of substances by embryologically related tissues. Many found in different tumors of the same tissue [4]. Therefore, they have low specificity and are not sufficiently sensitive as a screening test except for PSA. Although markers other than PSA have no place in routine screening, they frequently used in clinical settings with incorrect indications. In this study, we intended to evaluate the request of tumor marker tests at Uşak Training and Research Hospital according to age, gender, and pre-diagnosis.

2. Materials and Methods

Tumor marker test results including carcinoembryonic antigen (CEA), alfa-fetoprotein (AFP), thyroglobulin (TG), carbohydrate antigen(CA) 125, CA15.3, CA19.9, prostate-specific antigen (PSA), free prostate-specific antigen (fPSA) from patients aged 18 years and over were obtained from Laboratory Information System between 1 May and 31 July 2019 at Uşak University Training and Research Hospital. Obtained data were evaluated by taking into consideration criteria such as age groups, gender, outpatient- clinic requests, appropriateness of prediagnosis, normal-pathologic values, and group marker tumor demand. Three or more test requests in one examination of a patient were evaluated as “Group Test Request”. The request for free PSA (fPSA) test without a previously studied PSA test was called “Inappropriate fPSA Request”. Thyroglobulin test was performed on Immulite 2000 (Siemens Healthineers USA) and all other TM tests were performed on ADVIA Centaur XP Immunoassay (Siemens, Munich, Germany) autoanalyzer. All internal quality control (BIO-RAD, Lypocheck Tumor Marker Plus, United States) and external quality control (BIO-RAD, EQAS, QCnet international) analysis performed at the time of the period that the data collected were in acceptable ranges. The values indicated by the manufacturers in the kit package insert were accepted as the reference ranges for the tumor marker tests. Microsoft EXCEL and SPSS 21.0 programs used for the classification and statistical analysis of the frequency of test requests and calculate the percentage ratios. The distribution of the tests requested according to the clinics and diagnosis were examined. The distribution of the group test requests according to the clinics was examined. In addition, the request patterns of PSA and fPSA tests were examined.

The examined clinical scenario was the use of TMs in the general practice in which a meaningful overprescription has shown. The performance indicators developed considering both available evidence and implementation feasibility [5]. Previously defined evidence-based criteria were followed to develop performance indicators [6].

The performance indicators developed in the present study reported as below:

1. Age: According to the Clinical Practice Guide (CPG), the eligibility of requests from persons under the age of 40 is discussed. In accordance with this criterion, the cases under the age of 40 were checked.
2. Gender: According to CPG, TM (PSA, CA125, CA 15,3) is sex-specific due to some malignancies. In this study, we specifically evaluated whether these TM requests were limited to gender in which malignancy was common.

3. Diagnosis: According to CPG, many tumor marker tests are recommended for the follow-up of patients diagnosed with malignancy. In this study, it was evaluated how much of the TM requests were demanded from patients with a diagnosis or a pre-diagnosis of malignancy.
4. Group Test Requests: Since other tumor markers other than PSA were non-tissue specific, 3 or more TM requests at the same time were considered inappropriate.

Ethics Committee's Name: Local ethical committee of Usak University Faculty of Medicine
Ethics Committee approval number and date: 17 / 22.11.2019

3. Results

Of the 6998 TM tests, 6202 were requested from outpatients and 796 from inpatients. The distribution of test requests according to gender was determined as 4168 females and 2830 males. The distribution of tumor marker tests performed is shown in Table-1. Accordingly, the most demanded tests were CEA and PSA.

Table 1. TM Tests Distribution

Tests	Frequency	Percent
CA 125	1027	14.7
CEA	1521	21.7
CA 19-9	1163	16.6
fPSA	191	2.7
CA 15-3	965	13.8
PSA	1408	20.1
AFP	615	8.8
TG	108	1.5
Total	6998	100.0

The distribution of the tests according to the clinics and the rate of requesting appropriate diagnosis are given in Table-2. The ratio of TM tests requested per patient is quite similar among all TM tests.

Table 2. Test distribution according to clinics, the ratio of requests with appropriate diagnosis

Tests / Clinics	AFP	CA 15-3	CA 19-9	CA 125	CEA	fPSA	PSA	TG	Total
İnternal Medicine (n)	316	148	233	198	225	101	206	15	1442
Gastroenterology (n)	98	3	12	0	14	0	0	0	127
Surgeries (n)	51	198	257	187	290	37	1132	8	2160
Endocrinology (n)	6	2	0	0	0	0	11	83	102
Oncology (n)	23	274	295	101	644	53	59	1	1450
Gynecology (n)	121	340	365	541	349	0	0	1	1717
Total (n)	615	965	1162	1027	1522	191	1408	108	6998
With appropriate pre-diagnosis(n)	297	133	327	627	608	28	1078	93	3191
The ratio of appropriate pre-diagnosis to the number of patients (%)	**48**	**13.70**	**28**	**61**	**40**	**14.60**	**76.50**	**86**	**45.50**
Number of patients (n)	608	847	1007	1015	1368	183	1397	106	6531
Avg test per patient	1.01	1.13	1.15	1.01	1.11	1.04	1.00	1.01	1.1

Table 3. Diagnoses recorded for test requested

DIAGNOSES	**Frequency**	**%**
No diagnosis, General examination	1878	26.8
Non-malignant gynecological diagnoses	889	12.8
Benign prostatic hyperplasia	733	10.5
Pain	671	9.7
Menstrual disorders	498	7.2
Vitamin deficiencies	413	5.9
Other diagnoses not associated with malignancy	477	6.9
Non-malignant urologic diagnoses	378	5.4
Non-malignant gastroenterological diagnoses	278	4.0
Viral Hepatitis	193	2.8
Other disorders of the breast	181	2.6
Non-malignant thyroid disorders	131	1.9
Other liver diseases (including cirrhosis and fibrosis)	57	0.8
Malignancy related other diagnoses (Colon, Breast, Lung, Kidney)	52	0.7
Malignant prostate neoplasm	44	0.6
Unspecified masses in any part of the body	30	0.4
Unspecified mass in the breast	30	0.4
Abnormal weight loss	22	0.3
Total	6998	

Table-3 shows the distribution of diagnoses entered when requesting tumor marker assays. Accordingly, 26.8% of the tests were requested from patients without any diagnosis. The most commonly used diagnoses were non-malignant gynecological diseases (12.8%).

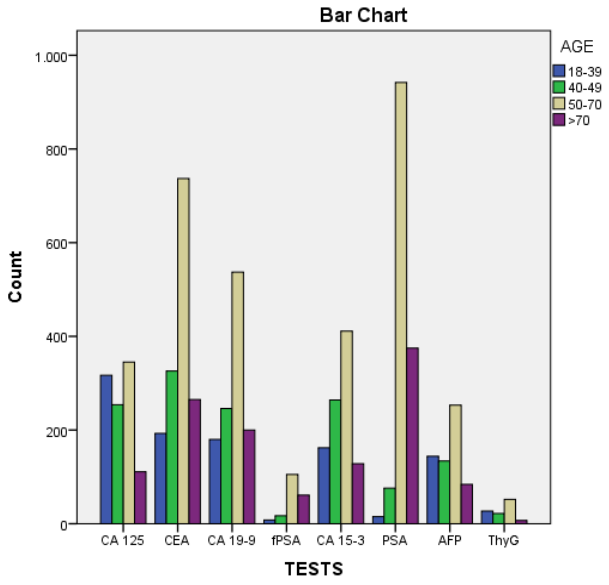

Figure 1. Distribution of Tests According to Age Groups

The age range where tumor marker tests were most frequently requested was found to be 50-70 (48.3%). In this study, the rate of TM requests under the age of 40 was found to be 15%. It is noteworthy that 30.8% of the CA 125 test requests were made from patients aged 18-39 years (Figure-1).

When the group requests are evaluated, it is seen that glycoprotein type TM tests (CA125-CA 15,3-CA 19,9-CEA) are frequently requested together. %46.3 of group test requests were ordered from the gynecology clinics (Table 4). Accordingly, the most commonly recorded diagnoses in the group test requests are those related to gynecological diseases (Menstrual disorders, etc).

Table 4. Clinical Distribution of Group Requests

CLINICS	**Frequency**	**%**
Gynecology	340	46.3
Internal Medicine	184	25.1
Oncology	98	13.4
Surgery	112	15.3
Total	734	100.0

The fPSA and PSA claims were further evaluated. Accordingly, fPSA requests are grouped as "Single appropriate fPSA Requests without PSA", Inappropriate fPSA requests with tPSA "," Single appropriate fPSA "," Appropriate fPSA Requests with PSA ". Only 37.7% of the fPSA tests were considered as appropriate requests (Table-5).

Table 5. Request Compatibility of fPSA

	Frequency	**%**
Single fPSA Requests without tPSA	42	22.0
Inappropriate fPSA requests with tPSA	71	37.2
Single appropriate fPSA Requests without tPSA	6	3.1
Appropriate fPSA Requests with tPSA	72	37.7
Total	191	100.0

4. Discussion

Tumor markers are minimally invasive, low-cost, and easily accessible tests that are used primarily for determining disease prognosis and treatment planning. It is important to use such easily accessible tests at the right time and to interpret them correctly. Guidelines to assist clinicians in this matter should put forward more effectively. Appendix 1 shows the diagnosis of the criteria of TM test requests. Laboratory specialists should consider these criteria when determining test request rules and arranging request papers.

Appendix 1: Appropriate TM Requests [7]

TUMOR MARKER	DIAGNOSIS CRITERIA OF TM TEST REQUESTS
AFP	1. Independent prognostic marker for NSGCT (e.g. of the testis). 2. Diagnostic aid for hepatocellular carcinoma and hepatoblastoma 3. Screening for hepatocellular carcinoma in high-risk populations
Ca 15.3	1. Detecting recurrences in asymptomatic patients with diagnosed breast cancer. 2. For monitoring the treatment of patients with advanced breast cancer
CA 19.9,	▪ Monitoring treatment of patients with pancreatic adenocarcinoma
CA 125	1. it is helpful for monitoring treatment with chemotherapy in ovarian cancer disease. 2. its measurement in postmenopausal patients with pelvic masses may help differentiate malignant from benign lesions
CEA	▪ Helpful in surveillance following curative resection of colorectal cancer and in monitoring therapy in advanced colorectal cancer.
PSA	▪ Diagnosis of prostate cancer and useful in determining prognosis, surveillance following diagnosis, and monitoring therapy in patients with prostate cancer.
TG	▪ TG is useful in monitoring the thyroid malignancies.
fPSA	▪ Total PSA values are between 4 and 10 µg/L

In this study, approximately 55% of TM orders were found to be incompatible with the diagnosis. PSA tests constitute 76.5% of the diagnostic-compliant TM orders. When we evaluated the diagnoses from patient records, we saw that almost 30% of the requested tests were with the diagnosis of general examination or without any pre-diagnosis. This suggests that physicians use TM tests as a routine biochemistry analysis. Deasy K et al showed that 79% of the orders were inappropriate [8]. The inappropriate use of TM tests could be harmful to the patient-clinician and government economy. Unnecessary TM tests will bring psychological stress to the patient as well as unnecessary further examination.

Different methods tried to prevent unnecessary test requests. For example, Durand et al. reported that due to small changes in test request forms, they reduced the inappropriate test request. In the forms, they wrote the organs where tumor markers were most affected and performed the tests on the prompt screen by separating the sections rather than one after the other [9]. Also, Ferraro et al checked all requests containing more than two TMs. Several of those were performed for diagnostic purposes. The most frequent and inappropriately requested TMs were carcinoembryonic antigen and carbohydrate antigen 19.9 [10]**.** In our study, group requests were made with glycoprotein structure tests (CA19.9, CA 15.3, CA125). Although these tests are structurally similar, it should be kept in mind that the organ pathologies to which they are primarily affected are different. The majority of these group test request is pelvic inflammatory disease (PID), ovarian cysts, and endometriosis.

Malignancy related diagnoses are only 1.3% of the total. Tumor marker requests from patients

with nonspecific diagnoses such as pain, menstrual disorders, and vitamin deficiencies are quite high, indicating that these tests are used for routine screening and / or are not deliberately requested.

In conclusion, if the frequency of inappropriate tests decreases, environmental, economical, unnecessary loss of workforce will be prevented, patients' waiting times will be shortened and contributions will be made to eliminate many problems including patient psychology.

Ethics Committee's Name: Local ethical committee of Usak University Faculty of Medicine

Ethics Committee approval number and date: 17 / 22.11.2019

The compliance to Research and Publication Ethics: This work was carried out by obeying research and ethics rules.

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International Journal of Health Services Research and Policy
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e-ISSN: 2602-3482

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Research Article

HISTOPATHOLOGICAL FINDINGS AND CLINICAL OUTCOMES OF PATIENTS AFTER LAPAROSCOPIC SLEEVE GASTRECTOMY

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Abstract:*Laparoscopic sleeve gastrectomy (LSG) has become an increasingly common method for surgical treatment of morbid obesity in recent years. This study aimed to evaluate the histopathological findings of gastrectomy specimens obtained in LSG and the clinical outcomes of patients. Between June 2018 and December 2019, the resected gastric samples of 170 patients with LSG underwent histopathological examination. Histopathologic examination is routinely performed on the gastric specimen that is resected during the sleeve gastrectomy for histopathologic examinations of the severity of inflammation, atrophy, intestinal metaplasia, and H. pylori infection. We found that the most common histopathological findings were chronic gastritis (58.2%), normal gastric mucosa (17.6%), and chronic active gastritis (12.4%). Patients with normal gastric histopathology after LSG lost more weight at the end of the 1st, 3rd, 6th, and 12th months than those with abnormal histopathological findings (chronic gastritis, chronic active gastritis, and edema congestion). Histopathologic examinations are extremely necessary for diagnosing lesions that may have been missed in endoscopies before sleeve gastrectomy. Many factors, such as age, sex, histopathology of the removed stomach, and H. pylori positivity, should be considered in predicting postoperative weight loss success.*

Keywords: *Obesity, Sleeve Gastrectomy, Bariatric Surgery*

Received: May 5, 2020 Accepted: June 03, 2020

1. Introduction

Obesity is a common condition that leads to chronic diseases, and it causes deaths due to many complications, including diabetes, cardiovascular diseases, cancer, and related comorbid diseases. Worldwide statistics represent that, more than 1.9 billion adults (39%) were considered overweight, and approximately 650 million (13%) were obese. In Turkey, 32.1% of adults were reported to be obese [1].

Nutritional changes applied for weight control, physical exercise, and obesity drugs are deemed insufficient in combating obesity, resulting in weight gain again after a short time [2]. Bariatric surgery has additional benefits over conventional health style modifications by reducing the stomach volume by decreasing the caloric intake or using restrictive procedures, or by decreasing the intestinal absorption by shortening the small intestine. For the past two decades, a laparoscopic sleeve gastrectomy (LSG) has emerged as the most popular bariatric surgery procedure worldwide [3,4].

Stomach samples obtained from bariatric surgery are assumed to be normal, except for unexpected incidental findings. However, this assumption was not supported by histological findings, and only a few studies are available on the histopathology of gastrectomy specimens obtained from bariatric surgery [5–7].

This study aimed to evaluate the histopathological findings of gastrectomy specimens obtained in LSG and the clinical outcomes of patients.

2. Methods

We selected our participants according to the 1991 NIH criteria (patients with a body mass index (BMI) of 40 kg/m^2 or BMI of 35 kg/m^2 due to at least one comorbid condition such as arterial hypertension, type 2 diabetes, obstructive sleep apnea (OSA), and dyslipidemia). Their surgeries and histopathological examinations were performed at a university hospital setting. The ethics committee approved this study. We retrospectively and systematically analyzed the demographic, clinical, and histopathological data obtained from the medical records of all patients who underwent LSG for morbid obesity.

Between June 2018 and December 2019, the resected gastric samples of 170 patients with LSG underwent histopathological examination.

Samples were obtained after vertical resection of the stomach during an LSG. Resection was tailored by using 38 Fr bougie. These samples were permanently sectioned in formalin and examined in general. Representative cross-section blocks of 2 mm thickness were fixed by formalin and paraffin, stained with hematoxylin and eosin, and examined by pathologists in the form of 2-mm thick-sliced slides. All patients with LSG received a routine *Helicobacter pylori* test. Slides were also stained with Giemsa to control the microorganisms. Additional pathological findings were examined with additional slides. The inclusion criteria were all patients undergoing LSG. All patients had undergone preoperative endoscopy. We also extracted the pre-operative clinical findings and postsurgical course of the patients. Then, data were entered and analyzed.

Ethical Statement: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

This study is approved by Pamukkale University Clinical Research Ethics Committee (60116787-020/22711; 19.3.2020).

3. Statistical Analysis

Extracted data were analyzed using the Statistical Package (SPSS) version 22.0 (SPSS Inc., Chicago, IL). Differences were considered statistically significant when $p < 0.05$. The participants' demographic, clinical, and histopathological characteristics were summarized by descriptive statistics (frequency, percentage, and mean ± SD or median and range). We also calculated the means and standard errors and 95% confidence intervals for continuous variables. Any association between two or more categorical variables was assessed by Chi-square/Fisher exact test as appropriate. In addition, any association between the two independent groups of quantitative variables was examined by unpaired *t*-test or Mann–Whitney U test as applicable.

4. Results

Among 170 patients included in the study, 134 (78.8%) were female, and the median age was 34.7±10.5 (18–70). The mean preoperative BMI was 43.1±6.7 kg/m^2 (32–67). Males had significantly higher BMI than females (p = 0.01). The average weight loss was 13.5±3.9 (7–31), 24.6±5.5 (15–45), 35.6±9.7 (20–60), and 43.5±8.8 (31–60) kilograms in the 1st, 3rd, 6th, and 12th postoperative months retrospectively. The excess weight loss (%EWL) were %24,6(10,5-54,5), %45,1(21,1-85,7), %61(27,1-112,5), %78,2(40,7-125) in the 1st, 3rd, 6th, and 12th postoperative months retrospectively. In particular, males significantly lost more weight than females in the 1st, 3rd, and 6th postoperative months (p = 0.0, p = 0.0, and p = 0,001, respectively) (Table 1).

Table 1. Demographic characteristics and clinical follow-up of patients

Gender	N (%)	Age Mean±SD* (Range)	BMI Mean±SD* (Range)	First-month given weight (n=109)	Third month given weight (n=79)	Sixth month given weight (n=42)	First-year given weight (n=11)
Male	36 (21.2)	35.1±10.01 (19-56)	45.7±6.4 (36-67)	16.3±5.7 (8-31)	29.8±7.7 (18-45)	44.4±10.6 (25-60)	48±14.4 (32-60)
Female	134 (78.8)	34.6±10.7 (18-70)	42.3±6.6 (32-65)	12.9±3.1 (7-25)	23.2±3.8 (15-31)	32.9±7.7 (20-50)	41.8±6.4 (31-52)
P-value		0.800	0,010	0.000	0.000	0.001	0.300

*SD, standard deviation

Of the patients, 34 (20%) had a smoking habit. Preoperative comorbidities were diabetes mellitus (13.6%), hypertension (9.4%), OSAS (3.6%), hypothyroidism (2.4%), insulin resistance (1.8%), factor V Leiden mutation (1.2%), and cardiac disease (0.6%). The first most common histopathological finding (n = 99, 58.2%) was chronic gastritis. Regarding the specimens, 30 (17.6%) were normal gastric mucosa, 20 (11.8%) were edema with congestion, and 15 (12.4%) were chronic active gastritis. Chronic active gastritis was divided into mild (2.4%), moderate (7.6%), and severe (2.4%) categories according to the amount of chronic inflammatory cells in propria (Figure 1). We also observed rare diagnoses. Other abnormal histopathology cases were incomplete type of intestinal metaplasia, gastrointestinal stromal tumor (GIST, Grade 1), and Dieulafoy's lesion separately. Those patients with these conditions were diagnosed intraoperatively, and the preoperative endoscopy was normal. However, none of these incidental findings had any clinical impact in terms of complications, and these patients remained well postoperatively.

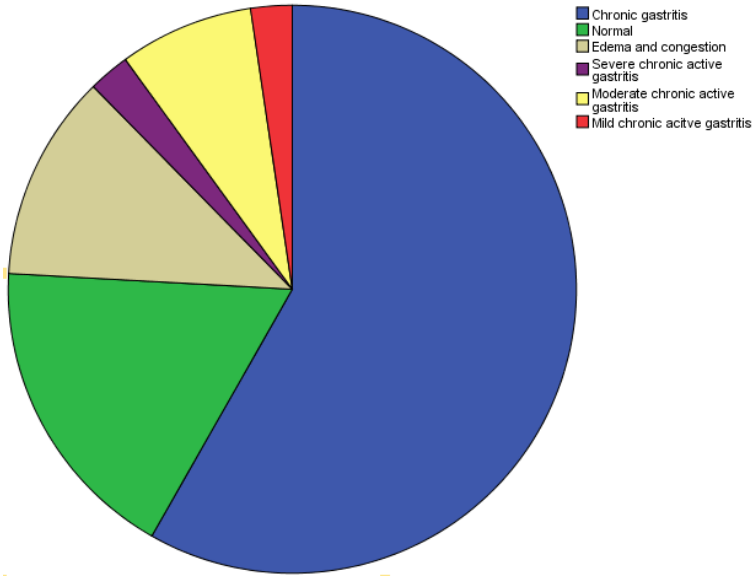

Figure 1. Histopathological findings of the patients

Patients with chronic active gastritis were older and had a higher BMI rate than those with other histopathological findings. In evaluating the histopathological findings according to gender, chronic gastritis was significantly higher in females than in males (86, 64.2%; p = 0.010) (Table 2).

Table 2. Histopathological findings according to gender

Histopathological findings	Female N (%)	Male N (%)	P-value
Normal	18 (60)	12 (40)	0.010
Chronic gastritis	86 (86.9)	13 (13.1)	
Chronic active gastritis	16 (76.2)	5 (23.8)	
Edema congestion	14 (70)	6 (30)	

Patients with normal gastric histopathology after LSG lost more weight at the end of the 3rd, 6th, and 12th months than the others (Table 3). The patients were evaluated in two groups: normal histopathological findings (group 1) and abnormal histopathological findings as chronic gastritis, chronic active gastritis, and edema congestion (group 2). In comparing groups 1 and 2, weight loss was higher in patients with normal histopathological findings at the end of the 1st, 3rd, 6th, and 12th months than those in patients with abnormal findings, and the difference was statistically significant at the 3rd month (p = 0.006).

Table 3. Histopathological findings and clinical follow-up of patients

Histopathological findings	N (%)	BMI Mean±SD* (Range)	Age Mean±SD* (Range)	First-month given weight (n=109)	Third month given weight (n=79)	Sixth month given weight (n=42)	First-year given weight (n=11)
Normal	30 (17.6)	44.3±6.7 (32-59)	34.5±12.7 (19-64)	14±4.9 (7-31)	27.5±7.5 (20-45)	38.2±11.7 (20-60)	48±14.4 (32-60)
Chronic gastritis	99 (58.2)	42.6±6.2 (32-65)	33.8±9.9 (18-64)	13.2±3.5 (7-27)	23.9±4.6 (15-34)	34±8.1 (20-47)	41.8±6.4 (31-52)
Chronic active gastritis	21 (12.4)	47±7.5 (40-63)	39.7±10.8 (24-70)	13.6±4.5 (8-25)	22.7±2.9 (18-27)	33.5±4.9 (30-37)	42 (42)
Edema congestion	20 (11.8)	41.05±8.02 (32-67)	34.3±9.05 (22-54)	15.1±3.8 (9-21)	22.2±3.3 (20-27)	33.5±12.02 (25-42)	42±14.1 (32-52)
P-value		0.010	0.100	0.500	0.040	0.500	0.900

We compared the age, BMI, and weight loss rates in the 1st, 3rd, 6th, and 12 months of *H. pylori* infection. No significant difference was observed according to *H. pylori* positivity (Table 4). Furthermore, *H. pylori* infection was regarded as a risk factor for chronic active gastritis. However, the two groups had no significant difference in terms of sex (Table 5).

Table 4. Demographic characteristics and clinical follow-up findings compared with H. pylori positivity

	H. pylori-positive	*H. pylori*-negative	P-value
Age (Mean±SD)	35.4±9.09 (19-51)	34.6±10.8 (18-70)	0.700
BMI (Mean±SD)	45.3±8.07 (35-63)	42.9±6.6 (32-67)	0.100
First-month given weight	13.2±4.6 (8-25)	13.6±3.8 (7-31)	0.700
Third-month given weight	21.5±3.1 (16-27)	25.0±5.6 (15-45)	0.050
Sixth-month given weight	35.3±10.7 (23-43)	35.6±9.8 (20-60)	0.900
First-year given weight	46 (46)	43.3±9.3 (31-60)	0.700

Gender and histopathological findings were compared with H. pylori positivity. Results can be followed from Table 5.

Table 5. Gender and histopathological findings compared with H. pylori positivity

	H. pylori-positive N(%)	*H. pylori*-negative N(%)	P-value
Gender			
Female	18 (13.4)	116 (86.6)	0.900
Male	5 (13.9)	31 (86.1)	
Histopathological findings			
Normal	0	30 (100)	0.000
Chronic gastritis	8 (8.1)	91 (91.9)	
Chronic active gastritis	15 (71.4)	6 (28.6)	
Edema and congestion	0	20 (100)	

5. Discussion

Sleeve gastrectomy is frequently used for obesity treatment worldwide, and it has already been proven as a safe and feasible surgical technique with good postoperative results along with significant improvement in accompanying comorbidities [8].

Histopathologic examination is routinely performed on the gastric specimen that is resected during the sleeve gastrectomy for histopathologic examinations of the severity of inflammation, atrophy, intestinal metaplasia, and *H. pylori* infection. We found that the most common histopathological findings were chronic gastritis (58.2%), normal gastric mucosa (17.6%), and chronic active gastritis (12.4%). According to various studies, the prevalence of histopathological findings of LSG specimens was 13%–74.4% for chronic gastritis, 35.2%–69% for normal histopathology, and 1.6%–8.4% for chronic active gastritis [9–14].

We also discovered rare and important pathological conditions, namely, incomplete type of intestinal metaplasia, GIST (Grade 1) with a microscopically negative margin, and Dieulafoy's lesion, illustrating the importance of postoperative histopathological follow-up.

GIST, which has an incidence of approximately 1/100,000 for all individuals, has a considerably higher incidence in patients undergoing bariatric surgery (0.3%–1.2%). In all of these studies with unexpectedly higher GIST grade, stromal tumors were not found in preoperative evaluation but during or postoperative histopathologic examination [15–18].

According to gender, age, and BMI were associated with chronic gastritis. Chronic gastritis was significantly higher in female elderly patients, but a higher BMI rate was found in males. Similar to our study, Safahaan et al. [19] reported that chronic active gastritis is associated with the female gender. Hence, obesity may be a risk factor for gastritis, and it is seen more frequently in women [19,20]. We found that males significantly lost more weight than females in the 1st, 3rd, and 6th months after surgery.

Similar to our study, 1012 patients with sleeve gastrectomy were evaluated and found to have a negative correlation between weight loss in females at 3 months [21].

Patients with normal gastric histopathology after LSG lost more weight at the end of the 1st, 3rd, 6th, and 12th months than those with abnormal histopathological findings (chronic gastritis, chronic active gastritis, and edema congestion). Previous studies that compared normal gastric histopathological findings with other histopathologies in terms of weight loss are unavailable. However, Erkinuresin et al. [22] reported that younger patients who had low BMI and inactive gastritis and underwent LSG could achieve more successful weight loss results than the older ones.

Globally, *H. pylori* infection is responsible for chronic bacterial infection, and most of the affected individuals are asymptomatic [23]. Some patients may develop gastritis, duodenitis, peptic ulcer, and other benign and malignant diseases [24–26].

Considering the high prevalence of *H. pylori* infection in our general community, our study results showed that *H. pylori* infection was diagnosed in 13.5% of our LSG specimens. This rate is higher than in the USA, Kuwait, and New Zealand (5.2%, 7.3%, and 8.6%, respectively) [12–14]. In other studies conducted in the Middle Eastern populations, *H. pylori* infection demonstrated a high prevalence (20%–97%) [24]. The prevalence of *H. pylori* in the obese population was 20%–50%, which is higher than our study (13.5%) [13,27,28]. We found that *H. pylori* infection is a risk factor for chronic active gastritis. Previous studies have similarly shown associations of *H. pylori* with chronic active gastritis [29–30].

We observed that the age, BMI, and weight loss rates of patients in the 1st, 3rd, 6th, and 12th months were not associated with *H. pylori* infection.

6. Conclusion

Histopathologic examinations are extremely necessary for diagnosing lesions that may have been missed in endoscopies before sleeve gastrectomy. LSG may be performed either as part of a staged approach or as a primary bariatric procedure in patients with obesity. Many factors, such as age, sex, histopathology of the removed stomach, and *H. pylori* positivity, should be considered in predicting postoperative weight loss success.

Ethical Statement: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

This study is approved by Pamukkale University Clinical Research Ethics Committee (60116787-020/22711; 19.3.2020).

Acknowledgment

The authors would like to thank Enago for the English language review.

Informed consent was obtained from all individual participants included in the study.

The authors declare that they have no conflict of interest.

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

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Research Article

THE EVALUATION OF BURNOUT AND COMMUNICATION SKILLS IN PRIMARY CARE STAFF

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Abstract: *Burnout syndrome is an important problem among health professionals. The aim of the study is to evaluate the relationship between the burnout status and communication skills in primary care staff. The study was conducted in the descriptive type between April and June 2019. The population of the study comprised of family physicians and family health professionals working in primary care unit. The participants were administered the Maslach Burnout Inventory, certain questions concerning sociodemographic characteristics, and the communication skills evaluation scale. In total, 383 individuals working in the primary care unit participated in the study. The mean age was 43 ± 8.1 and among them, 64.8% were women. The scores of the emotional exhaustion and depersonalization of family physicians were significantly higher compared to family health workers. While the depersonalization score of women was significantly lower than men, the sense of personal accomplishment score was higher than men. As the number of daily clinic visits of the family physicians increased, the rate of their emotional exhaustion and depersonalization increased. While the communication skills decreased as the emotional exhaustion and depersonalization increased, the communication skills level increased as the sense of personal accomplishment increased. Women, family health workers, the widowed/the divorced women, and age group were determined to have better communication skills. A significant relation was determined between burnout subscales and increased number of daily average clinic visits of physicians, gender and occupational groups. There was a significant relationship between communication skill levels and burnout subscales concerning occupational groups, gender, marital status and age groups.*

Key words: *Primary care staff, burnout, communication skills*

Received: May 11, 2020 Accepted: July 9, 2020

1. Introduction

The burnout syndrome is a condition that has been widely studied in recent years that often affects individuals whose profession is performed in contact with people [1]. Maslach made the current definition of the burnout syndrome as “an increase in emotional exhaustion and depersonalization and a reduced sense of personal accomplishment” seen in profession groups that work face-to-face with people in the long-term and stressful working environment [2]. The burnout is widely seen in doctors and has been reported in some studies by 25-75% [3]. The current medical literature shows that the

prevalence of the burnout among US doctors is rapidly increasing to epidemic rates exceeding 50% [4]. Particularly primary care physicians, those working in the emergency department and the frontline health staff with direct patient contact such as internal diseases have the highest burnout rates [5]. In a large-scale international study conducted to measure the burnout of family physicians in 12 countries of Europe, the burnout rates were found as 12% [6]. Health professionals constantly face with stressors (death, pain and loss) and the burnout in physicians increase due to problems during the treatment (treatment unresponsiveness and complications) [7]. This burnout in healthcare professionals adversely affects patient care, such as communication with the patient, patient satisfaction, and increasing medical errors [8, 9]. Similarly, the nurses working in primary care units were also reported to be at risk in terms of burnout in the literature [9, 10]. Skilled communication has an inverse relationship to burnout; that is, an incresase in skilled communication score is associated with lower level of burnout [9].

According to Furnham (1988), having the capacity to communicate effectively is one of the necessary qualifications for medical practice. Effective health care depends on not only the technical skills of the clinicians, but also the ability to establish and maintain an easy relationship with the patient [11]. The burnout can lead to poor quality patient care and medical errors [12]. Inadequate communication skills are reported as a strong obstacle in the delivery of health care services [13].
In this study, our aim is to evaluate the burnout status and communication skills of family physicians and family health staff working in the primary care unit. According to our hypothesis, the burnout rates are high in both study groups which affects the communication skills.

2. Materials and Methods

The descriptive study was conducted between April and June 2019. Before the study, Pamukkale University Faculty of Medicine approved the research by the Ethical Committee of Non-Interventional Clinical Researches.

The universe of the study is, 299 primary care units and 598 family physicians and the family health workers (nurse or midwife) they work with in Denizli. The study has no sample, in an attempt to reach the whole population in the primary care unit. The exclusion criteria of the study were determined as being unable to speak Turkish, having been diagnosed with a psychiatric illness and verbal consent denial. The participants were administered Maslach Burnout Inventory (MBI) to evaluate their burnout status, the communication skills scale (CSS) to evaluate their communications skills. In addition, a questionnaire to reveal the socio-demographic characteristics that included 9 questions (concerning gender, age, marital status, title, total professional experience, unit area, presence of chronic disease, number of daily patients, total professional experience in a primary care unit) prepared by the researchers based on the relevant literature. Of the 9 questions in this questionnaire, the number of daily patients was asked only to physicians. The surveys were conducted in the working environments of the participants, and it took an average of 20 minutes to complete each questionnaire.

2.1. Ethical Statement

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This study is approved by Pamukkale University Clinical Research Ethics Committee (60116787-020/20660; 20.3.2019)

2.2. Maslach burnout inventory

In the study, MBI was used to determine the burnout that the participants perceived. It was created by Maslach and Jackson (1981) and its adaptation to Turkish as well as its validity and reliability tests were also conducted by Çam (1992). The inventory evaluates the burnout in three sub-dimensions as emotional exhaustion, depersonalization and a reduced sense of personal accomplishment, and each question consists of a total of 22 items with five steps [14, 15]. İn our study the Cronbach alpha coefficient for overall scale was .902; the Cronbach alpha coefficient for emotional exhaustion subscale was .903; the Cronbach alpha coefficient for depersonalization subscale was .794 and the Cronbach alpha coefficient for personal accomplishment subscale was .783.

2.3. Communication skills scale

CCS is a 5-point Likert scale developed by Korkut (1996) to understand how individuals evaluate their communication skills. The 5-point Likert type scale consists of 25 expressions. The validity and reliability tests of the scale were conducted by Korkut, and the scale was found to be one-dimensional according to the results of variance analysis [16]. İn our study the Cronbach alpha coefficient for scale was .931

2.4. Statistical analysis

The data were analyzed with the SPSS 21.0 (Statistical Package for Social Sciences) package program. The continuous variables were given as mean ± standard deviation and the categorical variables were given as numbers and percentages. Since the parametric testing assumptions were not provided, Mann-Whitney U test and Kruskal Wallis Variance Analysis were used to compare the independent group differences. In addition, the relationships between continuous variables were examined with the Spearman correlation analysis, and the differences between categorical variables were examined with Chi square analysis. The statistical significance level was taken as $p < 0.05$.

3. Results

Of all family physicians and family health workers working in primary care unit in Denizli, 64% (n = 383) participated in our study. The mean age was 43± 8.1 years (min.-max. 23-66 years) and among them, 64.8% (n=248) were female and 53% (n=203) were physicians. Of the participants, 80.9% (n=310) were working in the city center, and 7.8% reported hypertension and 6.5% were diagnosed with thyroid disease. The average number of daily patients surveyed by family physicians was 64 (min.-max., 10-120). The socio-demographic characteristics of the participants are presented in Table 1.

Table 1. Socio-demographic characteristics of the participants

Variables		n (%)
Age, (median)		43.0 ± 8.1
Gender	Woman Male	248 (64.8) 135 (35.2)
Marital status	Married Single Widow/divorced	327 (85.4) 29 (7.6) 27 (7.0)
Title	Family physicians Family health workers	203 (53.0) 180 (47.0)
Professional experience, year	Family physicians Family health workers	20.5 ± 8.9 19.2 ± 6.8
FHC professional experience, year	Family physicians Family health workers	9.5 ± 3.5 9.6 ± 3.5
The number of clinic visits		64.43 ± 18.19
Workplace center		310 (80.9)
Chronic disease primary care staff	Hypertension Thyroid diseases Diabetes mellitus Rheumatological disease Gastrointestinal system disease Total	10.3 (5.0) 5.9 (7.2) 4.9 (3.9) 3.0 (3.3) 1.0 (1.1) 22.2

FHC: family health center

The MBI subscale average scores of the family physicians were determined as 18.31 ± 8.9 for emotional exhaustion, 6.3 ± 4.7 for depersonalization and 23.51 ± 5.4 for personal accomplishment. It was found that the emotional exhaustion and depersonalization scores of family physicians were statistically significantly higher and the sense of personal accomplishment scores were considerably lower compared to family health workers (p = 0.001; p = 0.0001; p = 0.004). İn terms of gender, while the depersonalization scores in women were statistically significantly lower and the sense of personal accomplishment scores were higher than men, the emotional exhaustion scores of women were lower than men, though statistically not significant (p = 0.0001; p = 0.002; p = 0.103, respectively). The personal achievement scores in staff patients with chronic diseases were statistically significantly lower (0.0047).

The average score of the communication skills scale was 104.29 ± 11.3. This score was found significantly lower in family physicians than family health workers (p=0.0001). İn addition, the average score of the communication skills scale of the female physicians was 103.40 ± 13.39 and that of the male physicians was 101.24 ± 10.84 and was statistically significantly higher (z = -2,320; p = 0.020).

The communication skill scores were found to be significantly higher at 40-49 ages and divorced /widowed ones compared to other groups (p=0.012; p=0.004. respectively). The comparison of the burnout subscale scores and the communication skill scores to sociodemographic data is included in Table 2.

Table 2. The comparison of the burnout subscale scores and the communication skill scores to the sociodemographic characteristics

	EE (Avg. ±SS)	DP (Avg. ±SS)	PA (Avg. ±SS)	CSES (Avg. ±SS)
Gender[a]				
Woman	16.28±7.9	3.92±3.5	24.8±5.1	105.9±11.3
Male	18.07±9.4	6.76±5.1	23.0±5.6	101.2±10.8
	z=-1.629	z=-5.274	z=-3.043	z=-4.336
	p=0.103	*p=0.0001*	*p=0.002*	*p=0.0001*
Marital status[b]				
Married (1)	16.5±8.5	4.8±4.4	24.2±5.4	103.9±11.4
Single (2)	19.4±7.6	4.3±3.5	22.5±5.2	102.0±10.1
Widowed (3)	18.9±9.2	5.2±4.5	25.6±4.7	110.6±9.2
	kwh=2.359	kwh=3.505	kwh=4.828	kwh=10.953
	p=0.096	*p=0.173*	*p=0.089*	*p=0.004(1-3.2-3)*
Age category[b]				
29 years and under (1)	17.28±5.0	4.83±3.2	24.6±3.9	100.5±18.3
30-39 years(2)	16.88±8.0	5.11±4.1	23.63±5.1	101.8±11.2
40-49 years (3)	16.75±8.5	4.3±4.1	24.5±5.2	106.1±10.6
50 years and older (4)	17.2±9.7	5.9±5.1	24.0±6.2	104.2±10.4
	kwh=0.335	kwh=6.859	kwh=2.636	kwh=10.997
	p=0.953	*p=0.077*	*p=0.451*	*p=0.012 (2-3)*
Job[a]				
Family physicians	18.31±8.9	6.3±4.7	23.51±5.4	102.0±11.8
Family health workers	15.33±7.6	3.3±3.4	25.0±5.2	106.8±10.3
	z=-3.195	z=-6.546	z=-2.918	z=-3.858
	p=0.001	*p=0.0001*	*p=0.004*	*p=0.0001*
Working place[b]				
City centre (1)	16.89±8.5	4.88±4.4	24.71±5.2	104.56±10.3
District (2)	17.8 ± 8.9	5.06±4.4	22.14±5.8	104.16±16.7
Other (village) (3)	15.09±7.4	5.18±3.8	22.05±5.2	100.77±10.1
	kwh=1.605	kwh=0.548	kwh=13.898	kwh=4.504
	p=0.448	*p=0.760*	*p=0.001 (1-2)*	*p=0.105*
Chronic illness[a]				
Yes	18.11±9.1	4.95±4.9	23.01±6.1	105.01±11.6
No	16.57±8.3	4.91±4.2	24.56±5.1	104.08±11.3
	z=-1.358	z=-0.604	z=-1.982	z=-1.018
	p=0.174	*p=0.546*	*p=0.047*	*p=0.308*

[a] Man Whitney U test used; [b] Kruskal walls test used

EE:emotional exhaustion, DP: depersonalization, PA: personal accomplishment, CSES: communication skill scores

The average daily clinic visit number of family physicians was determined as 64.44± 18.1. It was determined that there was a moderate positive correlation between the clinic visit number the emotional exhaustion scores; while there was a weak positive correlation between the clinic visit number and depersonalization scores, while no correlation was determined with the sense of personal accomplishment and the communication skills (r = 0.397 p = 0.0001; r = 0.152 p = 0.031; r = -0.053 p = 0.459; r = 0.091 p = 0.19, respectively). When the burnout subscale scores and communication skill

scores were compared, it was determined that there was a weak negative correlation between the communication skill scores and the emotional exhaustion, a moderate negative relationship between the communication skill scores and the depersonalization, and a moderate positive correlation between the communication skill scores and the sense of personal accomplishment (r = -2.66 p = 0.0001; r = -3.80 p = 0.0001; r = 4.73 p = 0.0001) Table 3 shows the relationship between Maslach subscales and daily polyclinic numbers and communication skills.

Table 3. The relationship between Maslach subscales and daily clinic visit numbers and the communication skills scores: Spearman's rank-order correlation test

	Emotional exhaustion		Depersonalization		Personal accomplishment	
	r'	*p*	*r'*	*p*	*r'*	*p*
The number of clinic visits	0.379	0.0001	0.152	0.031	-0.053	0.459
Communication skill score	-2.66	0.0001	-3.80	0.0001	4.73	0.0001

4. Discussion

Our study was similar in terms of the occupational groups and sociodemographic characteristics of the participants with other studies on burnout in primary care staff [6,17-25]. In our study, in line with the literature, the emotional exhaustion and depersonalization scores were determined to be higher in physicians, however, the personal accomplishment scores were lower compared to the family health workers [17-19]. This seems to be due to the huge burden of responsibilities in the medical profession and the fact that physicians have to make more critical decisions under uncertainty [26]. In addition, we think that since, compared to the family health workers, the physicians encounter more patients and face with much more cases such as malpractice, there is more burnout in physicians than family health workers.

When evaluated in terms of gender, similar to our study, it was also reported in the literature that the depersonalization in men was higher compared to women, while the sense of personal accomplishment was lower [19, 21]. Contrary to our study, in some previous studies, the burnout rate in women was found higher compared to men, and this was associated with their higher responsibilities. In our study, only the personal accomplishment scores of burnout subscales were determined to be lower in those working outside the city center, while no relation was found with other subscales. In a study conducted by Goehring et al., those working in the semi-urban and rural areas were found under risk in terms of the burnout level [21]. In addition. as shown in some previous studies, no significant correlation was found between the age and marital status variables and burnout subscales in our study [22-24].

Similar to our study, Gonzales et al., reported that as the daily average number of patient clinic visits of family physicians increased, their emotional exhaustion and depersonalization scores increased [19]. Another study reported that the number of annual primary care visits per patient that healthcare professionals receive is closely associated with healthcare professionals' empathy and burnout [25].
The healthcare professional's burnout affects negatively not only themselves, but also their communication with their patients and the patient satisfaction. In our study, it was found that as the family physicians and family health workers burnout increased, the communication skills decreased. Similarly, there are studies in the literature suggesting that healthcare professionals with high burnout level have lower communication skills [9, 27-29].

It was also found in our study that the female physicians and the family health workers had higher communication skill scores than male physicians. It is stated in the literature that, the communication styles of male and female differ in various ways and the interpersonal skills concern the quality of communication between the patient physician are higher in female physicians than male physicians In other studies conducted in primary care unit, it was revealed that the female physicians were engaged in establishing more partnerships with their patients and asking questions and they kept visits longer compared to their male colleagues [30, 31].

The most important limitation of this study is the burnout subscale scores differ from the previous studies in the literature. This difference is thought to be due to the fact that the healthcare professionals who participated in the study were working in different areas of the health system. the scale used was using different scoring systems and was performed in different regions [17, 21-23]. In addition, the communication skills evaluation was reported by the self-evaluation of the health professionals, thereby it has the potential for subjective assessment.

5. Conclusion

In conclusion, regardless of the age, marital status and working place of primary healthcare professionals, family physician's burnout more than family health workers and burnout in men more than women. Also, the burnout of physicians was affected by the number of daily clinic visit. In addition, it has been determined that as the burnout of the participant increases, their communication skills decrease.

The well-being of the healthcare professionals is of great importance as it will contribute both to themselves and to their patients by providing high quality health services [3, 8, 9]. Developing strategies to prevent the burnout will provide improvements such as treatment compliance, treatment response and recovery in both healthcare providers and patients.

Ethical Statement: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

This study is approved by Pamukkale University Clinical Research Ethics Committee.

Approval number and date: 60116787-020/20660; 20.3.2019

Conflict of interest: No conflict of interest was declared by the authors.

Financial disclosure: No financial disclosure was declared by the authors

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

e-ISSN: 2602-3482

IJHSRP

Review Article

TOWARD ORGANIZATIONAL EVIDENCE-BASED MANAGEMENT IN HEALTHCARE ORGANIZATIONS

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Abstract*: To date, relatively little evidence has been published as to what represents effective evidence-based management in healthcare organizations. Existing studies are rarely conceived or developed with respect to organizational factors determining whether such studies succeed or fail. One of the challenges in linking organizational factors to evidence-based management is to identify the focus at which characteristics of healthcare organizations and management of knowledge resources are most obvious. This paper sets out to sense this issue. The paper suggests a conceptual framework through reviewing the existing literature on organizational factors and evidence-based management in the healthcare sector. A new conceptual approach as to how organizational factors and managerial-decision process can be more effectively linked through the organizational-level of healthcare organizations. Recommendations are provided with regard to how future healthcare organizations can approach the evidence-based management from a logically wide organizational-level and context perspective. The present paper represents an attempt to link organizational factors and evidence-based management in a more meaningful way. A conceptual model has been provided as a way to frame and imagine the organizational circle of producing management evidence.*

Keywords*: Context; Organizational characteristics; Organizational culture; Evidence-based management; Healthcare organizations*

Received: February 12, 2020 Accepted: June 2, 2020

1. Introduction

Healthcare organizations (HCOs) today confronting so much information and knowledge processing, as huge data, which are produced daily by healthcare providing process. Managers have time and resources constraints that restrict the degree to which they can participate in evidence-based management and often lack the capabilities needed for evidence-based management, formulate organizational management issues, access colloquial and level data, investigate the evidence and apply it to decision-making. That lead to arguments about the need for standardization of knowledge and practice within HCOs.

Significant efforts in the conception of HCOs, motivated by improving the HCOs performance and focusing on accountability for quality, costs, and other measures. Not only the clinical decisions on

each patient's care must be improved to ensure healthcare is safe and efficient, but also the managing choices on how to manage it. It encourages managers to popularize their management perspectives and achieving robust sources of evidence for their decision-making. Healthcare Information and knowledge advances are opportunities that can facilitate the implementation of an evidence approach for HCOs management. If, however, this expertise is channeled into the evidence-based management (EBMgt) remit, a Trojan horse may seem to foster a 'top-down' hierarchy of organizational evidence. One way of finding out the most important sophisticated knowledge for HCOs with professionals is cooperating at different levels by organizing and disseminating.

Research on HCOs decision-making in the United States, Canada, and the UK suggests that the extent to which a decision-making procedure is used varies considerably and that managers seldom take advantage of evidence when making decision-making [1,2]. This unacceptable state of affairs is due to two main reasons. The first is that researchers have been more focused on testing theory and its explanation, rather than producing managerial interventions to better corporate managers practice. The other is that managers do not consider evidence rather than perspectives to cope with evidence.

It is shown that healthcare administrators have begun to accept the practice of EBMgt. Influenced by the evidence-based medicine or evidence-based practice movement, more and more healthcare administrators understand that when taking managerial decisions, the evidence-based approach must be taken [3]. Decisions based exclusively on personal experience and intuition are not prudent. Decisions have to be made in addition to the experience of HCOs' administrators on the basis of the best available evidence, organizational details, stakeholder concerns, and principles [3].

Tranfield et al. [4] recognize this need and compare research on management with medical research, in other words on dimensions including discipline nature, research culture, the design of research, the review protocol, and so on. They argue that the nature of management diverges while medicine converges. As a result, research culture on medicine is rigorously assessed, while management research is divided between the positive and phenomenological perspectives [4]. Rousseau and McCarthy [5] point to the improvement of managerial decision-minding and organizations achieving results when management education is focused on evidence [6].

Regarding the use of EBMgt, researchers have attempted to explain the difficulties that EBMgt can have for managers. The fact that managers and executives could not use enough evidence and the existing evidence does not fully apply was one of the apparent reasons [7]. As managers face responsibilities for the performance of their organizations, Bigelow and Arndt [8] wanted to know if something in the research helps them to better manage their organizations. Some scholars have acknowledged that a restricted management research base [9] and a gap between healthcare research and practice [9] have existed. Following the EBMgt debate, scholars believe that management evidence should be seen in a wide context [2].

1.1. Definition, meaning, and significance of evidence-based management

In the last 20 years, an intensive effort has been made to expand new organizational and governance frameworks and models, particularly in the healthcare sector [10]. Evidence-based management is defined as making decisions about the management of employees, teams, or organizations through the conscientious, explicit, and judicious use of the best available scientific evidence, organizational data, professional experiential evidence, and stakeholders' values and concerns [11]. Evidence-based originally derived from medical sciences in the 1990s, today's doctrines develop

in disciplines such as education, nursing, criminology, social sciences. But EBMgt is still in infancy in HCOs management [12, 13]. Important articles and strongly recommended EBMgt practice in the management of healthcare [8]. This "evidence" could be derived from research, internal organizational information, and even administrative experience [10].

Information from healthcare stakeholders, scientists, and professionals are required to fill gaps in this regard. This strategy of evidence-based decisions was clarified by Bongers [14] as trans-disciplinary where discipline integration is regarded as central and requires critical thinking and reflection, and the application of the best possible evidence. Evidence in EBMgt supports a tool to answer questions about the expected outcome of a decision. Hospital managers are therefore obliged to use the EBMgt to achieve efficient administration. EBMgt can improve the quality of organizational decisions and have a decisive impact on performance as a bridge from theory to practice [15].

Healthcare administrators are health officials whose decisions have a major impact on the efficiency of quality patient care and HCOs' success. Safety of patients, quality of care, and access and widespread demands for a reduction in care costs and value for money all demand an evidence-informed approach from healthcare administrators in decision-making [16]. An EBMgt approach to their management and administration is essential for healthcare administrators [16].

This multidisciplinary approach exposes HCOs to a series of expertise and evidence which can have a positive impact on decision-making within healthcare systems by the senior managers. For Rousseau, social science and organizational research should inform such decisions to decrease reliance on personal experiences rather than systematic knowledge [17]. In its management and organizational research, EBMgt recommends the use of the decent scientific practice of systematic syntheses. Such guidance requires efficient and competent management of the provision of healthcare services either at an institutional level or at an organization or macro level. Several experts have pointed to the significance of synthesis in assessing knowledge claims, quality control, threats to integrity, and preventing knowledge loss [18, 19]. It is, therefore, possible to come to the conclusion that EBMgt practices represent essentially a combination of critical thinking and evidence from various sources in order to promote the probability of positive results [20].

Axelsson [21] argued that healthcare managers should learn to think and appraise evidence from management research as a basis for their works. There are many viewpoints regarding EBMgt that are inspired and presented by organizations' specialists [18]. The administrators of HCOs have to learn the principles and processes of EBMgt, develop the abilities to search for information, assess the quality of evidence, and apply the evidence for their healthcare decision-making to ensure that the quality of healthcare and the cost of care is reduced. Providing EBMgt training would increase the knowledge of EBMgt and decision-making skills in HCOs [4].

EBMgt literature criticizes a corporate and administrative approach, which lacks evidence-based research in healthcare systems and organizations. The reasons provided are the pending danger of overuse, abuse, and underuse of information that can, in the end, have consequences for the well-being and efficient management of organizations [8, 18]. It is in the literature for a long time that management knowledge can and should become practical, so practices can benefit [17]. However, for a number of reasons it has not yet come to the heart of the practice, practitioners always rely on their own judgment or traditional convictions. Many researchers inspected the reasons for this unfortunate disconnection between management research and practice [15].

EBMgt is a way to regulate the methods of collecting, evaluating, and producing better standards and guidance. It is a method to manage the market of management ideas, which are regulated, controlled, evaluated, and therefore deemed more reliable in terms of the high quality of business knowledge [7]. So, if little or no reliable information is available for decision-making, managers are trying to do something based on evidence-based managing methods rather than guessing and expecting [7] on the basis of logic and evidence. Another valid argument is that evidence-based management is affected by the disease itself that it seeks to cure. In other words, while evidentiary management is attempting to promote the adoption of a cumulative body of management knowledge that managers validate, verify, and use, it does not boast a strong body of know-how. The lack of a hypothetical framework in the field could be one reason for this [22].

In case of that, the most relevant definition for our purposes of evidence is the factual, systematized form of information or observation presented to support or justify beliefs or inferences [23, 24]. For evidence to be useful, it must be rigorous and relevant to the context in which it is invoked. In other words, rigor and relevance are at the core of evidence generation and evaluation [15]. Pfeffer and Sutton [7] suggested that management can learn from the successful steps that other occupations, including medicine, have taken towards evidence-based practice in order to become EBMgt in a real organizational environment.

2. Methodology/approach

This is a conceptual framework that incorporates various types of viewpoints linked to each other. The framework includes coordination in various divisions of the organizations, based on research in the context of healthcare. This cooperation can also be primarily coordinated by multidisciplinary teams across the boundaries of different healthcare organizations.

The concept model is designed to incorporate evidence-based concepts to the literature in the management of healthcare organizations. The conceptual structure involves organizational tasks that must be undertaken in separate units by professional personnel. It aims to provide a fairly precise definition of entry-level decision making, better management of knowledge management resources (information, experience, research) in various stages, and an overview of broader dimensions (context, organizational features, corporate culture). The model is complemented by a series of efficient circles to assess organizational awareness, relevant findings, and recurrent awareness use and create a clear database for decision-making. It will provide sufficient details to test the concept in practice.

Searches were conducted of the commonly used health databases to identify relevant literature. Major health electronic databases including Emerald, EBSCO, Sage, PubMed, and Taylor and Francis were searched to retrieve appropriate published articles that may be applicable to research objectives. Three sets of search terms were used, namely, (1) ‘evidence-based’ and (2) ‘healthcare organization’ and (3) ‘management’. Additional references were identified through examination of the references from most relevant publications (snowballing).

Inclusion criteria were: (1) journal articles and grey literature written in English spanning the previous years; (2) studies that include evidence-based in healthcare organizations management. Exclusion criteria were: (1) studies that focused on clinical evidence or medicine evidence and (2) studies did not consider the evidence-based concept either they are related to healthcare organizations’ management.

The researcher checked the titles and abstracts of papers for significance, and where needed, the full text of papers was retrieved. For their contribution to the interpretation, literature, and philosophical understanding of evidence-based management, domain identifications, and alternative models, full-text papers were analyzed. Firstly, evidence that linked to the concept and definition of evidence-based management was identified. Secondly, evidence of health-care organizations has recently been considered and further work is still required to be formally adopted.

2.1. Conceptual model of evidence-based management

From the previous definitions of EBMgt, the author conceptualizes a model that may help when evidence has to be considered in the management of HCOs. The author considered three strategic criteria and three dissimilar processes to accomplish his model (Figure 1.). In addition, the author accepted the evidence to be at the organizational-level of HCOs, in case of evidence at this level may be more obvious and applicable to use the concept. The three strategic criteria included the organization's context, characteristics, and culture. The three processes included the organizational knowledge process, the knowledge usage and outcome cycle, and also the repeating process which makes the second process to be evidence for the same organization itself and other organizations. However, this model is an attempt to make the handling of evidence in management more rational and logical for managers, but not to be a guarantee as a standard for every managerial procedure or decision-making phase. The aim of this conceptual extraction model was to highly lighten and enhance the role of evidence mindset in the domains and evaluations of management for more rational and timely successful healthcare decisions, which can be a basis for future evaluation.

2.2. Context, characteristics, and culture of healthcare organizations

In the healthcare industry, there are many intangible properties and intellectual properties. It has many distinct characteristics besides being intensive knowledge than other sectors. The variables that influence Knowledge management (KM) can be organizational features, expert opinions, and planning in compliance with the literary assessment [25]. Many studies have discovered that more resources and instruments are being used as the scale (size) of the organization increases to introduce fresh information technology [25]. Various dimensional HCOs have a distinct attitude to the handling and use of the healthcare industry information.

Organizational culture is a summary of all members' particular values and organizational laws that affect communication between external parties and members of the organization. Tolfo and Wazlawick [26] proposed that members should share the organizational culture's values, beliefs, and laws. Wallach [27] split the organizational culture into the culture of bureaucracy, creative culture, and support culture. Four kinds of competing values have been suggested in Quinn [28]: rational culture, hierarchical culture, group culture, and growth culture. The features of DeshPandé and Farley [29] more or less demonstrate the rational culture, hierarchical culture, collective culture, and growth culture, as staff defines the culture of the workplace. However, one of these types usually dominates.

However, some studies indicate that when significant HCOs confronted issues, executives did not first consult with informed results. If EBMgt is not connected to efficient organizational environments, it is unlikely to achieve an extremely truthful choice on the quality of care. Although culture is described as a significant variable by Eddama and Coast [30] affecting the extent to which "reasonable" healthcare investment choices are based on evidence. A comprehensive study has been carried out on the prevalent

values in HCOs, and while the literature on the connection between culture and accomplishment is increasing, there is a slight focus on decision-making either as an endpoint or as a flexible interference.

In reality, culture has been defined as the hardest organizational concept to define, making it hard to assess the effect on decision-making. Clearly, culture is the decision-making method that can be inferred, but there is a need for proof to demonstrate how this occurs. The literature highlights the significance of study culture as a precondition for policymaking based on evidence. Hyder et al. [31] disclosed in their research of low and middle-income nations that the informant recognizes this statement. Given the present organizational and administrative culture of the healthcare system, if important capability weaknesses of the service feature as constraints, it would involve important changes in the activities of healthcare systems [32].

Arndt and Bigelow [7] asserted that their professionals could generalize outcomes across organizations and systems, promoting an EBMgt as a feasible decision-making model. Arndt and Bigelow indicated that EBMgt reflected the assumptions of evidence-based medicine in relation to the systematic implementation of the finest evidence available to assess organizational policies. Managers should review the results of appropriate studies and practice syntheses regularly before making significant choices [32]. While there is no powerful evidence and a systematic study suggesting that evidence-based management actually increases organizational efficiency and promotes managers' decision-making [33]. The generation of evidence can persuade the public to make better decisions within the organization through an evidence-based management approach [15].

Organizations face fresh dynamics of dissimilar cultures and situations in their settings, and managers are needed to create the correct choices through evidence from other cultures and environments. This requires more comparative studies seeking emerging universality and cultural specificity at the same time [34]. This problem shows the significance of including contextual variables as a significant source of conflicting results in the literature to enhance convergence and acknowledge contextual differences [35].

Contextualization attention has risen considerably over the past 30 years [36, 37]. The word context is used to refer to a business that is the appropriate setting for the practical application of study evidence. For reference to a community, the term context is used. These contextual factors are suggested to promote or limit the process of evidence-based decision-making at greater levels of evaluation. The gap between existing evidence and practice in healthcare management reinforces the necessity for more active resolves, without ignoring the organizational-level context. A greater understanding of this level can be significant in closing the undesired gap.

The structures and processes of each healthcare environment represent a unique organizational milieu, including the way an organization operates and acts. These structures (e.g., size, staffing) and processes (e.g. practical arrangements, decision support) are, individually or together, capable of promoting or hindering discreet action in terms of the adoption and application arrangements.

Our knowledge of what works is becoming increasingly essential to the organizational structure, not how it operates in implementing research structures and procedures in operational situations [38, 39]. However, as these activities are carried out in more organizations in diverse settings and places, their capacity to perform them in the way they were initially described and demonstrated to be efficient will continue to decrease without better and more specific inclusion of an organizational research framework into study implementation agendas [40].

2.3. Organizational information resources and decision-making

Healthcare administrators have indicated that organizational information in healthcare management has often been used for decision-making. The first type of information resource was organizational data [13]. The literature provides various levels of evidence used by managers and other healthcare professionals in their decision-making method. Evidence sources include; best accessible scientific research, organizational information, knowledge and judgment, and values and concerns of stakeholders [41, 42].

Management based on evidence is based on two assumptions. First, it is a linear decision-making method. For instance, Kovner & Rundall [43] sets out a decision method to sequentially define issues, search for options, evaluate alternative solutions, choose options, and execute these solutions. Second, it is possible to generalize and replicate the outcomes of these choices across organizations. The degree to which an organization can identify and process fresh information is probable to affect levels of rationality (i.e. instrumentalism) in decision-making. However, as mentioned above, this understanding is not restricted to formal evidence. It promotes the significance of tacit knowledge for organizational memory, and hence the background to decision-making [2]. Healthcare executives classified data generated within the organization as the most important and most frequently used type of evidence [2].

Kovner and Rundall observed that big HCOs are predisposed to depend on external management consultants for their strategic decision-making and execution plans and that the data on which such suggestions are based is not rigorously challenged by healthcare managers. An EBMgt strategy will risk promoting the dissemination of standardized information in HCOs. The analysis also points out that decision-making must have a well-understood organizational culture and strategic orientation.

2.4. Organizational evidence-based management

EBMgt imports making choices by using the best accessible evidence from various sources accurately, clearly, and sensibly to improve the probability of a suitable result [10, 43]. This approach is guided by the premise that the management evidence-practice gap is due not only to knowledge transfer issues but also to information manufacturing issues [44]. Managers, therefore, have a duty to make actual and effective choices that assist their organization's mission and vision, comparable to doctors who use the finest scientific evidence available in clinical patient choices [18]. However, between this perfect situation and the status quo [7, 45], there is a notable gap. From various research, the main factors were recognized. Several variables have influenced EBMgt, including organizational variables, facilitators, obstacles, policies, and individual and social variables [42].

Management based on evidence that translates best evidence-based values into organizational procedures. Practicing managers grow into specialists through evidence-based management that makes organizational choices informed by social science and organizational research. That leads to shifting professional choices away from personal preference and disorganized experience towards those based on the finest evidence presented [18, 46].

To bridge the gap between understanding of leadership and practice of leadership, we are encouraged to address the research-practice gap by the values of evidence-based management (EBMgt) [47]. Evidence can be a structured set of data submitted to support or justify one's views or inferences about a phenomenon of concern [23, 24]. Evidence can be derived from organizational understanding, insight, judgment, and experience of executives, distinctive environmental and organizational features, preferences of different stakeholders, external environment, etc [6, 47].

Common sense and empirical study support the concept that high-quality information leads to better choices [48]. Managers also understand the importance of such high-quality information, which is examined by a professional body that raises their professional status [49]. However, the selection of information sources by decision-makers is often determined by availability and not quality. In relation to accessibility, confidence is asserted to play a major part in the selection of information sources by decision-makers [50]. The notion of an autonomous organization accountable for assessing evidence and synthesizing results can assist narrow the gap between studies and practice.

Management based on evidence is conceptualized by interplaying evidence and context with a facilitating process organization [51]. Once knowledge is generated and enforced, feedback offers data that can identify obstacles to the application, contextual backgrounds, or unpredicted causal relationships. Organizational decision-making and execution of evidence are restricted by legal and ethical frameworks under which organizations operate [7]. The context in which knowledge is produced may differ in terms of politics, culture, economy, and so on from the context in which it is applied.

Practitioner managers are closer to day-to-day organizational issues and decision-making and are interested in gaining an actionable understanding that would allow them to create more efficient choices. Other main players are the disseminators of information, who are interested in information that can attract the greatest crowd and are therefore interested in significance. The objectives of each can be accomplished through close cooperation between these stakeholders. A structure that brings together rigor, significance, and actionability adds value by aligning the various interests and purposes. It is this alignment that offers the means and rationale for scientists, information disseminators, and practitioners' involvement and collaboration [15]. Kulik [52] claims that diversity management study is not helpful to professionals as it focuses more on how staff perceives appropriate practices than on whether such practices are efficient in attaining interesting organizational outcomes [15].

The EBMgt cooperation requires to define the characteristics of evidence to promote its application in order to produce practically helpful understanding. We contend that the synthesis of evidence should result in appropriate, thorough, and actionable information [53]. This range of sources well reflects the range of choices and judgments that healthcare practitioners (policymakers, organizational executives, and healthcare professionals) need to create on a daily basis [54] requiring distinct information and evidence levels.

Pfeffer and Sutton [7] recommend further that one of the explanations why managers do not make use of evidence as the basis for making decisions is that, it changes the dynamic authority of the organization. The decision power, as a key resource for decision-making rather than for organizational politics and structural powers, would be distributed according to the competence and master of evidence in a culture supported by evidence-based decision-making.

2.5. Organizational knowledge management

KM has lately become very important to health authorities in healthcare organizations. It is prepared to acquire the expertise to guarantee more effective information management, to enable healthcare employees to work in a virtual environment, and to enhance resource efficiency [55]. Hongsermeier, et al. [56] say that the application of a KM system plays a vital part in enabling the flow of knowledge through its life cycle. It should be understood that KM will have credible, real-time information on healthcare officials to support decision-making for better outcomes. There are three components to the transfer of knowledge: people, processes, and technology. People of these three parts

are the most significant pillar for information sharing. Therefore, adopting a healthy approach to the application of KM healthcare is incontrovertible [57, 58].

However, implementing and even succeeding KM programs within organizations is not a peaceful method. Their presence and strength are affected by elements such as organizational nature, type of organization, and service category. Given the sparse empirical information on how these variables affect KM, this supports the requirement and importance of studying such variables in particular situations [6].

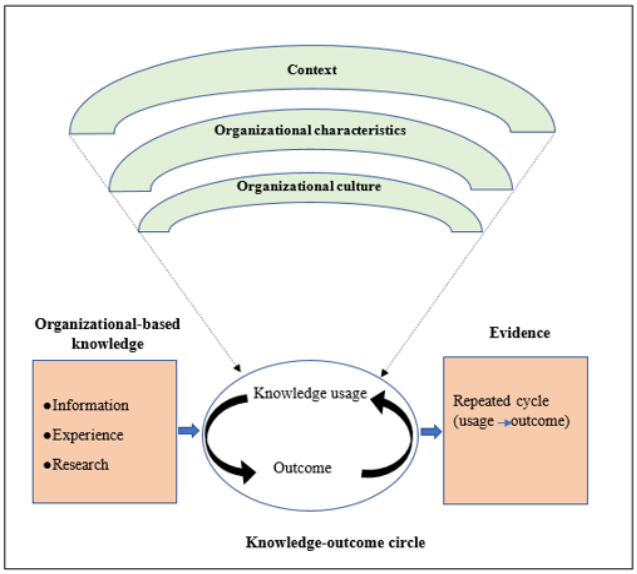

Figure 1. Conceptual framework of Organizational Evidence-based Management (developed by the author)

Scientific knowledge is needed for competent decision-making, but science cannot be only adequate to create choices [59]. Healthcare management is more probable to operate in a bad validity setting, like other management in general [60].

Implementation of KM system involves the use, transfer, and translation of information, prevention against a possible loss of understanding induced by retirement and employee turnover, acquiring competitive benefits, continuing learning, preventing organizational isolation and meeting user requirements [61]. Using knowledge means transferring it from rudimentary discovery to technical efficiency and then to acceptability processes, which indicates that this KM component involves two stages. This implies that knowledge is used by understanding, such as evidence-based rules. The third significant element of KM, the transfer of information, is the dissemination of information that is guided and regulated through distinct methods [62, 63].

The conversion of one type of understanding into the other and the group collaboration in the model system is essential. Knowledge database and management systems can be used to transform tacit knowledge into explicit knowledge. Tools such as decision support systems and electronic performance support systems are used to transform explicit knowledge into tacit knowledge [61]. KM is, therefore, an important factor for cooperation and information sharing in order to achieve an ideal outcome for the healthcare service [64]. To that end, the KM should be created accessible and easily accessible to anyone who wants it. Overall, the application of KM in the healthcare industry provides countless advantages.

However, the gratitude of EBMgt as social technology needs you to regard variables such as culture and values as involved components of the social setting that encompass the formulation, practice, and reception of choices. Such factors should not be isolated and reflectively interpreted by other sources of evidence. Healthcare managers should be conscious of the change of projects and understandings and participate in critical, open, and questioning dialog in their social realities [65].

Organizational epistemology indicates that there are three characteristics that define organizational understanding more exactly [66]. First, the organizational view of multiple knowledge allows the organization to understand [67, 68]. Objective or personal information [67, 69] measurement for that reason is inappropriate. Measuring organizational understanding without acknowledging and assessing the characteristics of individuals who want to provide understanding is also difficult. Second, organizational knowledge scope and context [66]. Knowledge within organizations may be very general or very special. Third, organizational knowledge is captured through language. People use language to differentiate relevant knowledge from what should be ignored [66]. For example, Arndt and Bigelow [8] examine the evidence in the context of healthcare by noting that "best evidence" is an artifact of social processes resulting in its development that reflects the interests of researchers or organizations, which questions they have to ask and which sources of information they legitimize [60].

The use of study expertise is now receiving significant attention from EBMgt and policymaking through the HCOs. Another element to consider is the knowledge translation method, which includes operations such as synthesis, dissemination, and implementation of information. This is seen from the point of view of decision-makers or policymakers because their critical objective is to promote the integration of study information into program and policy development decisions [70]. Chen, Liu and Hwang [25] observed that a significant number of healthcare scientists have submitted applications and frameworks for KM, while few have studied factors for its implementing programs. The literature contains a wide variety of variables that are critical to effectively performed KM [71, 72].

3. Discussion

HCOs are multifaceted organizations due to their multiple and ambiguous objectives, the nature of their activities, and the diversity of professionals that perform their tasks by contributing to the provided services. In healthcare, decisions and actions result from political, interpretive, and symbolic aspects more than from essentially rationalistic approaches. As highly pluralistic contexts, organizational knowledge, legitimacy, and social capital play an important strategic role. However, their accumulations involve a variety of internal and external stakeholders concerned with both internal conditions and external factors. This context challenges the managers to find the balance between the use of rational managerial models, which balance social mission and sustainability with a set of institutional forces.

Kovner and other scholars stated that EBMgt would expand the capability of decision-makers and their inspiration to use more systematic methods in healthcare management decision-making [7, 43]. However, rare studies have been published to examine whether healthcare managers use an evidence-based method for running decision-making. Managers in healthcare prerequisites to increase information and knowledge to generate stronger evidence related to the impact of EBMgt on organizational performance.

The EBMgt implementation process is influenced by the organizational culture, leadership, networks, resources, and evaluation, and feedback actions within HCOs. The concept of an independent organization responsible for evaluating evidence and synthesizing findings to increase its practical usefulness. Actually, we live in an era of "evidence-based everything", and that everything, medicine, management, economics, healthcare policy, and the other sciences-have become evidence-based [42, 73].

Despite its claims to rationality, EBMgt is actually presented in terms that evoke institutional theory. If a research study were to associate an outcome with a specific decision in a particular HCO, the use of EBMgt would have it serve as a basis for other organizations to solve a like problem and diffuse the practice in question. Rousseau [17] even suggests that the use of EBMgt produces legitimacy in the judgments of stakeholders. Such arguments reflect an institutional view of HCOs that focuses on the dissemination of practices that are approved by model organizations in order to sustain organizational legitimacy [74]. In that case, EBMgt merely creates new constraints that would add to the difficulties of HCOs to cope with internal complexity, sustain the adaptability needed to survive in a complex environment, and view unanticipated outcomes as inevitable or a "gift from an uncertain world" [75].

4. Conclusions and future implications

It is significant to shift proficient choices away from personal favorite and unsystematic knowledge towards those based on the finest organizational evidence available. An autonomous organization accountable for assessing evidence and synthesizing results can increase flexibility in the workplace information collaborations and presents guides for professionals to use. However, little is known about the diffusion of organizational EBMgt, but the assumption is needed to be widely disseminated.

The applicability of EBMgt within different HCOs urged to participate and cooperate more, in order to increase the amount and process of fresh information available in the field. Organizational-based data, experience, and research networks should be expanded and adding to the EBMgt knowledge-base. HCOs in different sectors need to bring researchers, managers, and practitioners together to conduct more organizational EBMgt by collecting and organizing EBMgt information resources and provide the synthesized information for practicing. This exertion can help healthcare managers to consult the best available evidence for their decision-making.

After examining the nature of evidence as defined by advocates of EBMgt, the author close with a discussion of consequences and implications for HCOs management. The variety of how healthcare organizational aspects are outlined and defined complicates their measurements and the ability to integrate them into the decision-making progression. How individual and organizational constructs are intellectualized and measured in relation to the implementation process depend on (1) The conceptual model and organizational theory underlying the management level; (2) The nature of the organizational characteristics; (3) The size and the complexity of the organization itself.

Nevertheless, management based on evidence translates best evidence-based values into organizational procedures. For strategic or operational decisions, other kinds of information are useful but not sufficient. As a result, various sources of information must be considered by simple inspection of data trends and patterns. It is essential for managers to make informed decisions and to identify the

relevance to the specific problem of evidence that appropriate management of knowledge. Likewise, this can help narrow the gap between management research and practice. For healthcare to be effective, timely, and reliable, the management and policy decisions have to be evidenced about how to organize, manage, and improve that care.

Ethics declaration: As my manuscript is a conceptual one, so it does not contain material and analysis of data. It also has not had an ethics committee's permission like a research article.

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

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

e-ISSN: 2602-3482

IJHSRP

Review Article

FACTORS AFFECTING NURSES' JOB SATISFACTION IN MEDICAL SURGICAL NURSING CARE IN TURKEY: A SYSTEMATIC REVIEW

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Abstract: *Job-related satisfaction has the likelihood of improving the care provided by nurses within the health settings. Nurses' job satisfaction is likely to boost quality healthcare services and their commitment level. Several factors inform the job satisfaction of nurses, such as fair promotion opportunities, retention, and fringe benefits. The study aimed to explore the main factors impacting medical-surgical nurses' job satisfaction. The existing literature revealed that work satisfaction among nurses is affected by a number of aspects. A systematic review of studies was conducted. A total of (n=40) studies were eligible for inclusion. Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines were used to report and examine the eligibility of various studies. The systematic review indicated the factors could be classified into four categories, including extrinsic, intrinsic, personal, and community factors. The extrinsic factors include working conditions, work environment, supervisor/management, burnout, work engagement, and mobbing/bullying. The main intrinsic factors were found to include professionalism and career identity. Personal factors included marital status, age, and level of education, whereas economic status was found to be the only community factor influencing the satisfaction of medical-surgical nurses. The main factors influencing medical-surgical nurses include extrinsic, intrinsic, personal, and community.*

Keywords: *Job Satisfaction, medical-surgical nurses, intrinsic factors, and extrinsic factors*

Received: June 7, 2020 Accepted: July 8,2020

1. Introduction

Job-related satisfaction has the likelihood of improving care provided by nurses within the health settings. Nurses' job satisfaction is likely to boost quality healthcare services and their commitment level [1]. Low satisfaction results in poor healthcare services and shapes the intention to leave the hospital. Thus, the satisfaction of nurses is considered to be the primary determinant of sustainable quality patient care and retention of these professionals [2]. Job satisfaction is a significant issue affecting nurses in surgical care or wards. Job satisfaction among these professionals has been

linked to the availability of professional development opportunities, promotion, and achievements [3]. Job-related satisfaction is an extremely subjective concept and is consequently complex and multidimensional [4]. research studies connect numerous aspects to nurses' job-related satisfaction in various clinical working settings and various nations [5].

Job satisfaction is mainly determined by actual job experiences together with expectations concerning the job. There are varying job satisfaction levels among nursing professionals. However, the predictors of job satisfaction among nurses are fairly common, and entail working conditions, promotion, working hours, and pay, and others [6]. Nurses form the primary workforce responsible for protection, improvement, and promotion of the population's health [7]. Thus, their job satisfaction is considered to be paramount Job satisfaction among nurses is mainly impacted by both extrinsic and intrinsic factors [8]. Herzberg's theory shall guide the study. The model suggested that job-related satisfaction is affected by two key sets of elements, namely intrinsic factors, and extrinsic factors. Some of the extrinsic factors include working conditions, interpersonal relations, and quality of supervision. The main intrinsic factors are responsible, the nature of work, individual growth, achievement, as well as recognition [9]. The review of the past study indicated that numerous studies had been conducted concerning job satisfaction among medical surgical nursing care setting nurses. However, the researcher noted that there is no systematic review that has been done to determine factors affecting nurses' job satisfaction in medical surgical nursing care in the context of Turkey. The researcher hopes to inform stakeholders in medical surgical nursing care about the main factors affecting nurses' job satisfaction. Variations in extrinsic, intrinsic, personal, and community factors and expectations that are associated with the clinical departments may affect nurses' job satisfaction. Therefore, our study question used to handle the research was: What are the factors linked with job-related satisfaction for nurses working in medical-surgical settings in the context of Turkey?

1.1. Aims

The main aim of the review is to present a systematic and meta-analysis of research examining factors affecting nursing professionals' job satisfaction within medical surgical nursing care. The study aimed to identify extrinsic, intrinsic, personal, and community factors that impact job satisfaction amongst nursing professionals working in medical-surgical care settings.

2. Materials and Methods

The study employed Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines. The guidelines were used to report and examined various studies. The guideline helped in ensuring quality reporting of studies related to the area of interest. PRISMA guidelines also ensured that the systematic and meta-analysis were limited to the scope of Turkey and the medical-surgical care setting.

2.1. Search Methods

The search for relevant literature was done between March 25 and 28, 2019. The search process was limited to randomized applied studies and theses, focusing on nurses' job satisfaction within medical and surgical care settings. The search was carried using various online academic databases, including Ebscohost, Proquest, PubMed, Scopus, CINAHL, Embase, Emerald, MJ Clinical Evidence,

PsycINFO, and Web of Science. The search was also done in a doctoral and master's theses databases in Turkey. Several search terms were used to enable search as well as retrieval of appropriate studies in the online databases, as mentioned above. The search terms included *medical-surgical care nurses, job satisfaction among nursing professionals in medical-surgical settings, job satisfaction*,' and '*medical surgical nursing care in Turkey*.' Boolean operators "AND" and "OR" were also used.

2.2. Inclusion and Exclusion Criteria

Current study limited to journal articles and theses related to medical surgical nursing care settings. Studies using other designs not relevant were also included. It was further restricted to work published from 1995 to 2020. The inclusion criteria were studies focusing on nurses in medical-surgical care settings in Turkey. Studies were also eligible for review if they offered comprehensive information concerning factors affecting nurses' job satisfaction within medical surgical nursing care settings. Studies were excluded if their scope was not limited in Turkey's medical-surgical care settings. They were also excluded if they focused on general nurses in Turkey. Studies published below 1995 were also excluded.

2.3. Search Outcomes

The search yielded 1400 references (n=1400) from the databases mentioned above. The full copies of the eligible studies for inclusion were retrieved and further assessed for their relevance. The abstracts were analyzed to gather insights regarding the methodology used in each study and results. Duplicated articles were excluded (n=800), and 600 verified based on the area of research. The manual cross-checking led to the expulsion of (n=400) as they failed to fulfill the set inclusion criteria. A total of (n=200) copies were excluded as they did not address the subject area, and the remaining (n=200) were thoroughly examined for and (n=100) excluded as they did not focus on nurses in Turkey medical-surgical care setting. Sixty (n=60) studies were omitted as they emerged to be copied, and the rest (n=40) qualified for inclusion. A summary of the retrieved studies was presented based on PRISMA guidelines, as demonstrated in Figure 1.

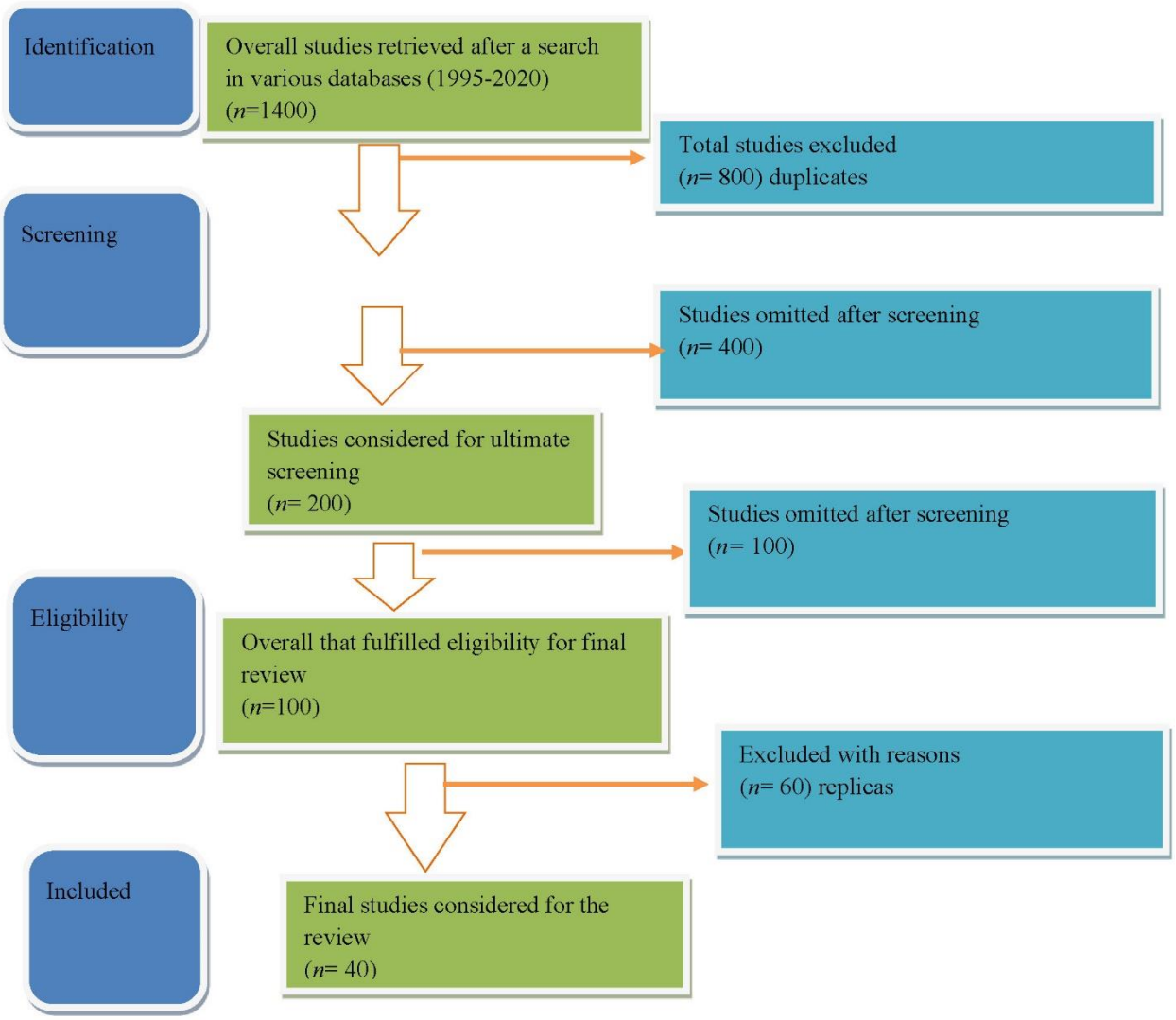

Figure 1. PRISMA guidelines.

2.4. Quality Appraisal

Two independent reviewers examined the selected studies. The study also utilized the Joanna Briggs Institute (JBI) to facilitate the appraisal of the quality of selected studies. The selected studies were subjected to rigorous appraisal by two critical appraisers. The evaluation informed both synthesis and explanations of the study's findings. An assessment of risk bias was also conducted, as indicated in Table 1.

Table 1. Assessment of risk bias for the selected research articles.

Studies	Are the inclusion criteria of participants clearly indicated?	Were the participants and settings thoroughly described?	Were job satisfaction factors measured?	Were the studies' outcomes measured in a valid as well as a reliable way?	Was a suitable statistical approach employed?
Burke et al., 2012	✓	✓	✓	✓	✓
Cilingir et al., 2012	✓	✓	✓	✓	✓
Torun and Cavusoglu, 2018	✓	✓	✓	✓	✓
Uğurlu et al., 2015	✓	✓	✓	✓	✓
Sabanciogullari and Dogan, 2017	✓	✓	✓	✓	✓
Çelik and Hisar, 2012	✓	✓	✓	✓	✓
Tural et al., 2015	✓	✓	✓	✓	✓
Cimete, Gencalp, and Keskin, 2003)	✓	✓	✓		
Ariza-Montes		✓		✓	✓
Bardakçı and Günüşen, 2016.	✓		✓	✓	✓
Çevik et al., 2012		✓	✓	✓	✓
Cilingir et al., 2012	✓	✓	✓	✓	✓
Efe and Ayaz, 2010			✓	✓	✓
Ekici et al.,2017			✓	✓	✓
Emhan, 2012	✓	✓	✓		✓
Er and Sökmen, 2018		✓	✓	✓	✓
Gok et al., 2015		✓	✓	✓	✓
Goris et al., 2016	✓	✓	✓	✓	✓
Montgomery et al., 2015.	✓	✓	✓		✓
Ofluoğlu and Somunoğlu, 2012	✓		✓	✓	✓
Özer et al., 2017.	✓		✓	✓	✓
Ucuk and Yurtsal, 2017.	✓	✓	✓	✓	✓
Yildirim and Yildirim, 2007.	✓	✓	✓	✓	✓
Yıldırım, 2009.	✓	✓	✓	✓	✓
Yıldız et al., 2009.	✓	✓	✓	✓	✓
Yurumezoglu and Kocaman, 2012.	✓	✓	✓	✓	✓
Seren Intepeler et al., 2019	✓	✓	✓	✓	✓
Korhan et al., 2014	✓	✓	✓	✓	✓
Aksakal et al., 2015	✓	✓	✓	✓	✓
Palaz, 2013	✓	✓	✓	✓	✓
Seyrek and Ekici, 2017		✓	✓	✓	✓
Burke, Koyuncu, and Fiksenbaum, 2010	✓	✓	✓	✓	✓
Orsal et al., 2017	✓	✓	✓	✓	✓
Danaci and Koç, 2019		✓	✓	✓	✓

Table 1. (continued)

Arslan Yurumezoglu and Kocaman,2016	✓	✓	✓	✓	✓
Cagan and Gunay, 2015	✓	✓	✓	✓	✓
Erdem et al., 2008	✓		✓		✓
Sabancıogullari and Dogan, 2015a	✓		✓	✓	✓
Sönmez and Yildirim, 2018	✓	✓	✓	✓	✓
Sabancıogullari and Dogan 2015b	✓	✓	✓	✓	✓

2.5. Data Abstraction and Synthesis

The author conducted the data extraction. The primary data extracted for this particular systematic review included journal, country, authors, population, setting, purpose, and research questions. Others included sample, data collection instruments, and main findings of the studies, sampling technique, and response rate. Thematic analysis was used to extract and present the needed data.

3. Results

Study Characteristics

Various studies involving medical-surgical nurses were included in this systematic and meta-analysis. The studies included cross-sectional, descriptive, and longitudinal. All the studies included were conducted within Turkey's medical surgical nursing care center.

3.1. Extrinsic Factors Affecting Job Satisfaction

The reviewed studies associated work engagement with enhanced job satisfaction among medical-surgical care nurses [10, 11]. There is substantial evidence that work engagement impacts Turkish nurses' job satisfaction [12]. Burnout was also found to adversely affect nursing professionals' work satisfaction [15]. A study reported that level burnout on job satisfaction using a sample of 330 surgical and medical ward nurses in a hospital situated in northeastern Turkey was found to be negatively associated [16]. Burnout was also found to results in low satisfaction with other studies [17, 18].

Nursing professionals in surgical medical care job-related satisfaction was further found to be influenced by working conditions. It was further found to be influenced by the working environment [19, 20]. A work environment characterized by the sufficiency of both equipment and materials was found to enhance the quality of work-related satisfaction. Supervisor support was revealed as another extrinsic element determining job-related satisfaction of nursing professionals [22, 23]. Higher-level of work satisfaction was reported by nurses being supported by their supervisors [24, 25]. It was further found that mobbing/bullying adversely influences nurses' job satisfaction [28]. It was revealed that mobbing behavior by head nurses adversely impacted work-related satisfaction among the nurses [29-31]. Nurses who are the victim of bullying tend to have reduced job satisfaction [32-34]. The likelihood of being bullied by a nurse manager tends to decrease job security and, ultimately, job satisfaction among the nurses[35-37].

In summary, the reviewed previous studies indicate that these multiple and different external factors such as work engagement, burnout, working conditions, and environment, supervisor support, mobbing, bullying have played an important role in nurses' job-related satisfaction.

3.2. Intrinsic Factors Impacting Job-Related Satisfaction

The reviewed articles showed that career identity is certainly linked to job-related satisfaction amongst medical and surgical nursing professionals in a total of 28 national healthcare settings as well as 14 university health organizations in seven regions across Turkey [38]. It was also found that professionalism was correlated with work-related satisfaction amongst medical/surgical nurses across Turkey [39, 40]. Professional identity was found to promote job-related satisfaction hence reducing nurses' intent to leave [40].

In summary, the reviewed previous studies indicate that these multiple and different internal factors such as career identity, professionalism, and Professional identity have played an important role in nurses' job-related satisfaction.

3.3. Personal Factors Affecting Job Satisfaction

The review indicated that marital status and age influenced work-related satisfaction among medical-surgical nurses working in varying hospitals within Turkey. Job-related fulfillment amongst single medical-surgical nurses aged 40 years and above was found to statistically significant [41]. The educational level was associated with job satisfaction. Medical-surgical nurses with masters and Ph.D. reported higher job satisfaction [42].

In conclusion, recent findings have shown that such numerous and distinct personal variables, such as marital status, age, and educational qualification, have played a significant role in the satisfaction of nurses at work.

3.4. Community Factors

It was further found that the economic status of medical-surgical nurses influenced their job satisfaction across Turkey. The low economic level was linked to reduced job satisfaction [42]. Consequently, the economic level factor has played an important and real role in the job-related satisfaction of the nurses.

4. Discussion

The study focused on examining factors influencing medical surgical nursing professionals' job satisfaction utilizing journal articles published from 1995 to 2020. The results of the study were examined through the lens of Herzberg's model. The job satisfaction influencing factors were categorized into four main categories, including extrinsic, intrinsic, community, as well as personal. The review was limited to medical-surgical nurses in Turkey. The findings demonstrated that work-related burnout was the main extrinsic job satisfaction factor [16]. Other identified extrinsic factors include working conditions [43] and work engagement. A nurse's work satisfaction job was further linked with supervisor support [22] mobbing [28] and bullying [37].

The findings also highlighted that the common intrinsic factors influencing job satisfaction among medical-surgical nurses include career identity and professionalism [39]. Different personal aspects were demonstrated to determine job satisfaction among medical-surgical nurses in Turkey. The

main factors found to be marital factors and age [41] and level of education [42]. Lastly, the primary community factor found to influence the satisfaction of medical-surgical nurses is the economic status [42]. The results demonstrate that various factors influence medical-surgical nurses' job satisfaction, and hence hospital administrators and managers should be close attention to these factors. Especially nurses are particularly profoundly active in patient care and have a significant wide role.

The measurement methods and tools for predictors and results were difficult to define and have not sometimes been recorded for their reliability and validity. It will influence the study's internal and external validity. Consequently, causal inferences cannot be made from the analysis, and thus the interpretation of the observations must be viewed in the context of this significant caution. Studies on the variations between variables impacting the job satisfaction of nurses in medical-surgical settings remains a gap. More work into this subject will help organizations to adapt their strategies depending on their position to increase job satisfaction for medical-surgical nurses. This analysis offers scientific evidence for the theory of Herzberg. Herzberg's hypothesis can offer analytical insight into the effect on medical-surgical nurses' satisfaction with both intrinsic and extrinsic influences.

5. Limitations of the Research

Though focused on standardized and accepted methods, this analysis has several drawbacks. It contained just English language articles spanning the past two decades. In comparison, grey publications and unpublished research have not been recovered, which omitted possibly valuable knowledge outlets which suggest that the findings do not reflect all valid study in this area. Moreover, the researcher found minimal studies focusing on medical surgical nursing care. The researcher was also unable to find randomized applied studies for the current review.

6. Conclusion

The main aim of this systematic review was to explore factors affecting nurses' job satisfaction in medical surgical nursing care in turkey. Several available studies have discussed the factors considered to be associated with medical-surgical nurses' job satisfaction around the world but unfortunately, there are not in Turkey. Researches on the variations among variables affecting the job-related satisfaction of nurses in medical-surgical settings remains a gap. Although these nurses have a unique, broad, and intensive role in daily care for different types of patients. Further research into this subject might support organizations to make their plans to enhance medical-surgical nurses' job-related satisfaction based on their workplaces.

The existing literature revealed that job satisfaction among nurses is affected by several important factors. The review indicated that the work environment, supervisor/management, burnout, work engagement, mobbing/bullying, professional identity, marital status, age, educational qualification, and the economic level are the main factors influencing nursing satisfaction in medical-surgical departments in Turkey. Nevertheless, the researcher found minimal studies focusing on medical surgical nursing care. The researcher was also unable to find randomized applied studies for the current review.

It is important to pay attention to these important factors. The researchers recommend that hospitals and nursing managers must design and execute approaches and strategies that maximize the efficacy of these important different factors. It should always be remembered that neither personal,

economic nor intrinsic, extrinsic factors alone are considered to be sufficient to reduce job-related dissatisfaction among medical-surgical nurses. Rather, It is important to focus on them together to achieve the best results.

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INESEG
INTERNATIONAL ENGINEERING SCIENCE AND EDUCATION GROUP

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

e-ISSN: 2602-3482

IJHSRP

Review Article

VIOLENCE AGAINST HEALTH WORKERS AND MEASURES TO PREVENT VIOLENCE

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Abstract: *Violence in health, which constitutes a serious problem in Turkey and all over the world has become a global problem. It is admirable by every segment that healthcare professionals today struggle with a global problem such as coronaviruses or serve altruistically in every timed. Nevertheless, while providing services, they somehow experience communication problems with their patients and relatives, and they are subjected to physical, verbal, or psychological violence. In order to prevent violence for employees who are exposed to violence for many reasons; Work should be done on issues such as security, physical structure and equipment, communication, education, and making necessary revisions in the legal regulations on this subject motivates healthcare professionals. Health violence is not only caused by healthcare professionals, patients, or their relatives. The working system of the institutions, high density of the number of patients, the insufficent number of the personnel, the social and global factors, as well as the news in the media that we pay particular attention to in our study, can lead to the emergence of violence. The existence of violence in social life is a result of mass media's inevitably publishing the violence in health. This is why positive developments and negative events in the field of health are published in the media. The purpose of our study is to prepare a stress-free, worry-free working environment for our future healthcare professionals and us without understanding our colleagues.*

Keywords: *Violence, health communication, health journalism*

Received: April 23, 2020 Accepted: May 27, 2020

1. Introduction

Health, according to the World Health Organization; it is not only the absence of disease or disability, but the state of physical, social, and mental well-being. It is the expression of a person's physical and spiritual well-being. Health is vital for the individual to continue his life in society regularly. The person whose health is impaired cannot fulfill his role in society, family, and the institution he works for [1-2]. In this process, he may have to go to hospitals or other health institutions to gain health. The ill person waits for healthcare professionals to be understanding with themselves and to work to alleviate their illnesses and troubles. When these expectations are not met for various reasons

or if they are met late, the tension of the person may increase even more. In this process, tension can turn into violence [3].

Violence: Any attitude and behavior that results in physical, sexual, psychological, or economic damage or suffering of the individual. In general terms, it includes extreme emotional state, the intensity of a case, stiffness, rough and harsh behavior, abuse of body power, and activities that harm individuals and society [4]. According to the definition of the World Health Organization (WHO), violence is the threat of deliberate use of force that results in injury, death, psychological harm, developmental retardation, or neglect against the person, another person, or a group [5]. The increasing concept of violence has become an important phenomenon that needs to be emphasized recently. Violence in Health; It is called physical or verbal abuse by patients and their relatives to healthcare professionals [6]. Since verbal violence and physical violence are common in our country, people in our country do not know the definition of psychological violence [7]. Psychological violence is a type of violence that is exposed to humiliation, insults, and threats, that is, an outspoken person who exposes the other and harms him by putting pressure on him [7].

Causes of violence

The causes of violence for those who practice violence; violence was self-rightfulness, health policies implemented, disease psychology thought of neglect, poor communication, misunderstanding, dissatisfaction with treatment, excessive workload, long waiting time, alcohol drug effect, and bad news [8].

Causes of violence occure because of the hospital; insufficient security measures in the hospital, not supporting the manager after the violence, not being trained to deal with violence, not being informed about the functioning of the employee safety unit, not taking measures against workplace violence, not being informed about how to report violent incidents, having no crime and not working in the hospital. ranked [8].

Mobbing is a form of psychological violence. The word 'mob' means an irregular crowd or gang who engage in illegal English violence. Mobbing, which is the English form of action of the mobbing; psychological violence means siege, harassment, and discomfort or distress [9]. Mobbing is a concept frequently used by people working on organizational psychology recently. The concept of mobbing, which means intimidation, suppression, intimidation, ignoring, is seen as the source of organizational conflict, inefficiency, and unmotivated. When talking about violence, we should not only think of the type of violence that leaves a physical trace [10]. Because violence is not only physical in its rough form, but it also harms the individual in terms of psychology. On the other hand, the effects on healthcare workers negatively affect the profession by causing sleep disturbance and stress [11].

There are many reasons for violence in health. Some of these are long waiting times. There is a concept called triage about this. Triage; determining the priority of the patient. It is a system applied all over the world but unfortunately, there is no triage consciousness in our country. Later, low education levels, excessive desire, and dissatisfaction with patient relatives, inadequate security, communication problems such as being alone with patients and relatives, and misunderstanding are common causes [12]. Some of the factors that encourage violence are as follows; The trauma experienced by the individual in childhood, the habit of solving everything from childhood violently, watching the violent scenes on television, and the awareness of the person who applied violence as “justified” shows that violence has become unavoidable [13].

According to the researches, it has been determined that those working in the health field have been attacked more than 16 times than those working in other business fields. According to the data of the Ministry of Health, it is stated that the number of recorded violence cases between 2013 and 2017 is over 60 thousand [4]. Violence in the health sector, other differs from the violence in the sectors. Health employees must be in close contact with the patient and family, often under difficult conditions. Depending on the patient's medical condition, medications can act aggressively [14]. In pain and sadness, bad news, own impulse, and anger control due to problems that could not be brought to the hospital without their consent health professionals who need to contact people are at serious risk. In the world frequency of exposure to violence (any violence type: 22.0% - 88.6%; physical violence: 2.6% - 57.0%; verbal violence: 24.3% - 82.0%; sexual harassment: 1.9% -10.5%) [15].

In his study of Alçelik for health care workers and friends in Turkey, 60.3% of nurses are reported affected by the violence. In another study, it was determined that 68.5% of the nurses were subjected to verbal harassment, 47.8% to verbal intimidation, 10.5% to verbal sexual harassment, and 16% to physical attack. In this study, verbal harassment and verbal intimidation are mostly done by patient owners and companions (64% and 66.9%), followed by the patient and doctors, verbal sexual abuse (41.9%), and physical attack (48.8%).) is mostly done by the patient himself [16].

Health violence in our country is seen in many regions and has become inevitable. Recently, violence in health has come to the fore a lot. Healthcare professionals react very much to this situation. Today, the White Code application is used to prevent violence in health [5].

The Ministry of Health launched the "precautionary" 113-White code application in 2012. This application is more; It is free legal support in the litigation process to the relevant health personnel against the attack against the health personnel exposed to violence [5]. White Code; It is an emergency reporting tool aimed at preventing violence against Healthcare Professionals. This code notifies hospital workers in case of risk, saves time for correct intervention, prevents panic, and helps institutions to ensure patient and employee safety. The white code number is known as 113 [17].

Violence incidents that healthcare workers are exposed to increase gradually. In order to prevent violence for employees who are exposed to violence for many reasons, studies such as security, physical structure, and equipment, communication, education should be made, and necessary revisions should be made in legal regulations on this issue [17]. Implementing the legal regulations regarding the criminal sanctions of violence, providing adequate legal and psychological support to the health worker who is the victim of violence, providing self-sacrificing working conditions in public spots, and using the communication tools of violence against the health worker, suggestions to be taken in the health system [18].

When we look at the reports about the place where the violence took place, it was shown that it was the most common in the emergency departments and the second in psychiatry clinics. In the study in which the employees working in health institutions in Eskişehir, Ankara and Kütahya were asked whether they have been subjected to any type of verbal, physical and sexual violence at least once in the last year of their profession; They stated that they encountered violence in emergency services and services, general practitioners and nurses in health institutions [19].

2. Conclusion and Suggestions

As a result; health care workers in Turkey and the world is faced with various hazards and risks to health services during the presentation. Although the phenomenon of violence that is encountered or accepted so often that can be considered normal is a risk for all occupational groups, it is much more common, especially in healthcare institutions. Physical actions that result from aggressive behaviors and lead to various injuries are described as violence. Patients' relatives generally resort to physical or verbal violence in health institutions. There must be a physical and social distance between hospitals and employees. It was observed that the relatives of the patients exerted violence against the healthcare workers by showing that the patients were urgent. Communication training should be provided to healthcare workers who are exposed to violence. The relatives of the patients who apply to verbal violence should be prevented from registering and providing a companion service.

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

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