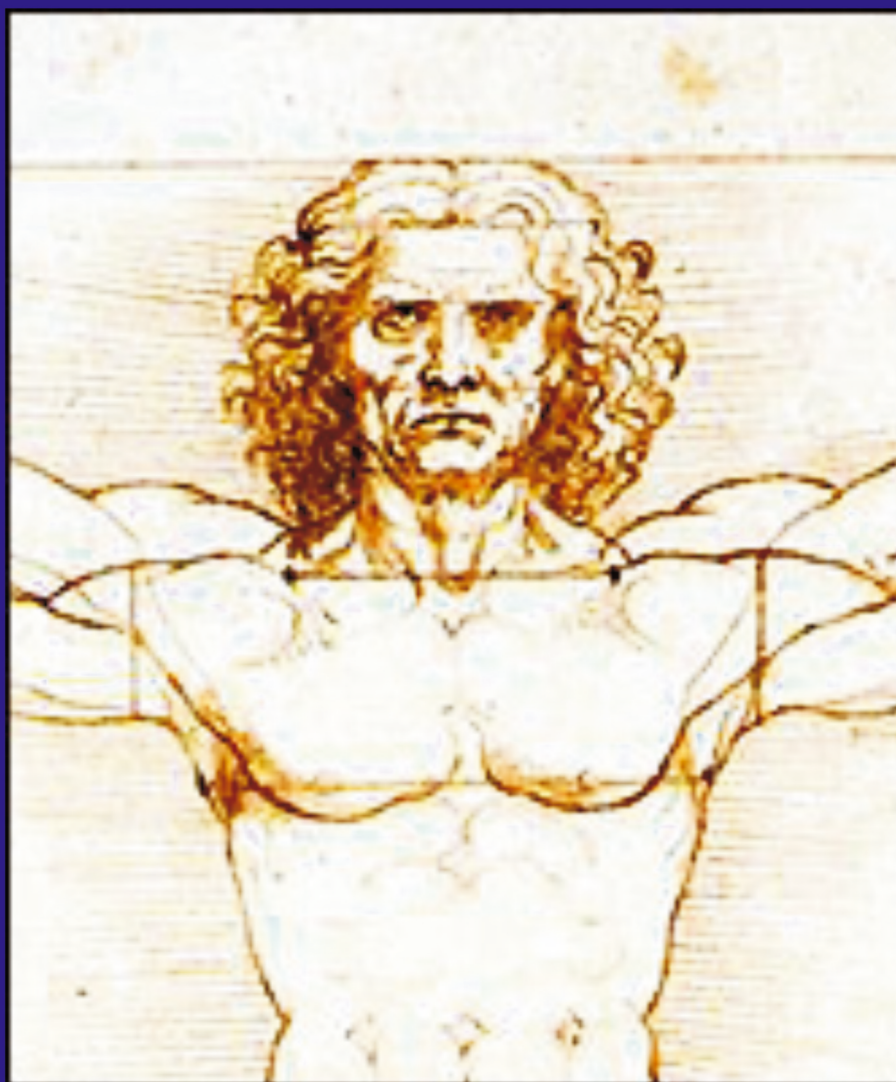


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Piši da preneseš

Uradi da te pamte

* * *

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Write to impart

Work to be remembered

Avdo Ćeranić

STIGMATIZING ATTITUDES AND THE USE OF STIGMATIZING LANGUAGE TOWARDS MENTAL ILLNESS AMONG DOCTORS AND NURSES IN TURKEY

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Abstract: Introduction: It is common knowledge that individuals with mental illness face many negative consequences of stigmatization. They are also super sensitive to the attitudes of health professionals. This study aims to investigate the stigmatizing attitudes and language usage of mental health professionals and to compare them with non-mental health professionals.

Material and Methods: A total of 722 healthcare professionals were asked to complete the sociodemographic characteristics data form, the questionnaire including the list of stigmatizing words for mental illnesses, and the Attitudes Towards Mentally Ills Scale (ATMIS).

Results: Research shows that mental health professionals have less stigmatizing attitudes when compared to other healthcare professionals ($p = .000$). However, it is determined that there is no difference in terms of the number of stigmatizing words used by both groups, and the most frequently used psychiatric diagnostic expressions with stigmatizing purposes are personality disorders. The number of stigmatizing words used by physicians is more than nurses ($p = .000$). Mental healthcare professionals have more positive attitudes in both short-term and the long term relationship scale scores. Both groups show that the mean score is lower in long-term than in short-term relationships.

Conclusion: Working in the mental health field does not lead to a positive change in terms of language use in stigmatizing purposes and reducing stigmatizing attitudes in a long-term relationship with individuals with mental illness. It is recommended to increase the awareness of physicians about the use of stigmatizing language.

Keywords: Stigmatization, attitudes, doctor, nurse, mental illness, language.

INTRODUCTION

Stigmatization is defined as the perception of the person by the society in which he lives in an unusual, discredited, and disrespectful way (1). The first and largest group of stigmatization in most societies are people with mental illness (2). Stigmatizing attitudes of society prevent the stigmatized people from seeking treatment; it can lead to consequences such as discrimination, loneliness, stress, violence, and suicide (3, 4). Studies suggest they are exposed to exclusionary attitudes by the public for reasons such as being considered aggressive, inconsistent, and unpredictable behavior, misinformation of the public through the media, and cultural characteristics of the society (5).

Researches have reported that healthcare professionals may also share some social prejudices against mental illnesses (6, 7), which may impair the quality of care (6-11). Because of their stigmatizing attitudes, general medical conditions accompanying mental illness are diagnosed later and poorly treated. This can lead to a shorter life expectancy for these individuals even when suicide and accidents are excluded (12, 13).

There are also stigmatizing attitudes towards individuals with mental illness among mental healthcare professionals (MHCPs) (8, 14). Some studies comparing MHCPs attitudes with other colleagues report that they display less stigmatizing attitudes than others (15, 16), while some studies say the opposite (17). When it comes to studies comparing the attitudes of physicians and nurses, some indicate that nurses have a more negative attitude (18), while others show no difference (19). In conclusion, the results of the comparison of stigmatizing attitudes of healthcare professionals are not consistent in the literature. Besides, the fact is that

stigmatization attitude researches on mental illnesses in healthcare professionals in our country have been conducted in a single center, and the sample numbers are relatively low (9, 11, 20).

Healthcare professionals thoughts, speech styles, language use, and forms of expression about individuals with mental illnesses are important when reflecting their attitudes and behaviors towards these patients (20, 21). Studies suggest that healthcare professionals should be more attentive in paying attention to the words they choose, how and for what purpose psychiatric diagnoses are used (22). The awareness of healthcare professionals has to be increased in terms of not using mental illness diagnoses in a stigmatizing manner (20, 22).

This study aims to research the stigmatizing attitudes and language usage of MHCPs and compare them with healthcare professionals working outside the mental health field. Our first assumption is that MHCPs have a more positive attitude and use stigmatizing words less than other healthcare professionals (OHCPs). The second is that physicians have more positive attitudes than nurses and use stigmatizing words less.

MATERIAL AND METHODS

The research was conducted between 01.02.2019-01.05.2019 by delivering questionnaires and scales (Google forms) to the healthcare professional groups via the Internet (social media, professional e-mail groups, etc.). The research questionnaires and scales were prepared in a way that the participants could only participate once and send after replying all questions without leaving them blank. After their informed consent was obtained, the participants were provided to fill in anonymously and without time restrictions. All physicians and nurses who answered all the questions in different parts of Turkey were included in the study. Healthcare professionals working in the field of mental health for less than a year were excluded. The study was approved by the Ethical Committee of the Izmir Bozyaka Training and Research Hospital (Approval no 2019/11).

Measures

Sociodemographic data form: The form requested the sociodemographic and professional information of the participants. One question asked the participants if any mental disease or disorder was used in a way that was mocking or humiliating by them. The words in the question were inspired by the same words used in a similar study before, and the total score was calculated by accepting each word as a score (20).

Attitudes Towards Mentally Ills Scale (ATMIS): It was developed to provide information about the ap-

plicability of the treatment approach in the community. It begins with an exemplary case (vignette) that fillers should consider in responding to attitude items. It is a 5-point Likert-type scale consisting of 22 items, and its validity and reliability study has been performed. Also, the scale has two subscale scores, namely short-term relationship and long-term relationship (23). The overall high score indicates a positive attitude.

Statistical analysis

All data were analyzed with SPSS 21 statistical software. Data are mean, standard deviation, and percentage distributions, as well as descriptive statistical methods; Among the parametric tests, Student's t-test was compared to categorical variables using the chi-square test. The statistical value of $p < 0.05$ was considered significant. One-way analysis of variance was performed to test whether more than two independent groups differ significantly in terms of mean scale scores. Cohen's d value was found to be 1.00 when the type 1 error of the study was accepted as .05 and post hoc power analysis was performed with the scale means and standard deviations of the groups. This value showed that the number of samples and statistical results of the research were of beneficial impact (24).

RESULTS

A total of 722 healthcare professionals participated in the study. 282 (39.1%) were adult psychiatrists, 106 (14.7%) were child psychiatrists, 112 (15.5%) were mental health nurses, 188 (26%) were other healthcare physicians (specialists in other fields, general practitioners), and 34 (4.7%) were other healthcare nurses. The details of the sociodemographic data and the number of professionals in occupational groups are in Table 1. The data of the participants were divided into two groups as mental healthcare professionals (MHCPs) and other fields' healthcare professionals (OHCPs). The professionals in the field of mental health like psychiatrists, child psychiatrists, and psychiatric nurses constituted MHCPs group ($n = 500$, 69.3%); specialist doctors (e.g. general surgeons, cardiologists, etc.) and nurses working outside the mental health field and general practitioners constituted OHCPs group ($n = 222$, 30.7%). There was no statistically significant difference between the two groups except for gender ($p = .004$).

A comparison of the stigmatization attitude scores of the healthcare professionals and the number of stigmatizing words used is given in Table 2. The long-term relationship mean score was lower in the whole sample than the short-term relationship mean score. According to the status of working in mental health, when

Table 1. Sociodemographic data and occupations of health care professionals

	MHCP (n = 500) (Mean ± SD)	OHCP (n = 222) (Mean ± SD)	<i>t/X²</i>	<i>P</i>
Age (year)	42.16 ± 11.7	42.52 ± 12.09	-0.37	.707
Education (year)	16.99 ± 3.83	17.23 ± 3.82	-0.79	.425
	Number (%)	Number (%)		
Gender				
Female	367 (73.4 %)	185 (83.3%)	8.42	.004
Male	133 (26.6%)	37 (16.7%)		
Occupation				
Mental Healthcare Physician	388 (53.7%)			
Mental Healthcare Nurse	112 (15.5%)			
Other Healthcare Physician	188 (26%)			
Other Healthcare Nurse	34 (4.7%)			

MHCP: Mental health care professionals, **n:** number of subjects, **OHCP:** Health care professionals working outside the mental health field, **SD:** Standard Deviation, $p < .05$ is statistically significant.

Table 2. Comparison of the stigmatization attitude scores of the health care professionals and the number of stigmatizing words used

	MHCP (n = 500) (Mean ± SS)	OHCP (n = 222) (Mean ± SS)	<i>z/t</i>	<i>P</i>
Short Term Relationship	43.40 ± 6.47	38.08 ± 6.92	2.86	.005
Long Term Relationship	34.22 ± 7.38	29.26 ± 7.625	.33	.000
ATMIS Total Score	77.62 ± 12.66	67.33 ± 13.46	9.87	.000
Number of Words Used*	4.25 ± 3.11	1.31 ± .462	-0.85	.394

MHCP: Mental healthcare professionals, **n:** number of subjects, **OHCP:** Healthcare professionals working outside the mental health field, **SD:** Standard Deviation, $p < .05$ is statistically significant.

* Participants were asked to mark the terms determined by researchers for condescending, humiliating and / or mocking purposes for individuals who do not have mental disorders. Each term is accepted as 1 point and the total score is calculated.

the groups were compared in terms of the number of stigmatizing words they used, there was no difference between them ($p = .394$). Top three most common used stigmatizing words by MHCPs were Antisocial ($n = 215$, 61.8%), Border ($n = 164$, 47.1%), Narcissistic ($n = 129$, 37.1%); by OHCPs were Obsessive ($n = 144$, 48.8%), Antisocial ($n = 124$, 42%), Psychopath ($n = 114$, 38.6%). Distributions of stigmatizing words used by groups are given in Figures 1 and 2.

All samples were divided into four groups according to their professions and were compared in terms of ATMIS total attitude score and the number of stigmatizing words used. ATMIS's total attitude score of mental health physicians and mental health nurses was higher than the other two groups ($p = .000$). Among the occupational groups, the number of stigmatizing words used by the physicians was higher than the nurses (Table 3).

Table 3. Comparison of health care professionals in terms of total scores of ATMIS and the number of stigmatizing words used by occupational groups

	OCCUPATION	N	X	SD	F	P	Relationship Between Groups
ATMIS Total Score	A	388	43.69	6.241	34.55	.0000	A = B > C = D
	B	112	42.20	7.174			
	C	188	38.23	6.890			
	D	34	37.24	7.144			
Number of Stigmatizing Words	A	388	4.40	3.022	7.70	.000	A = C > B = D
	B	112	3.32	2.918			
	C	188	4.76	3.290			
	D	34	2.85	2.862			

A: Adult and child-adolescent psychiatrists, **ATMIS:** Attitudes Towards Mentally Ills Scale, **B:** Nurses working in the mental health field, **C:** Physicians working outside the mental health field, **D:** Nurses working outside the mental health field. **F:** Anova test value, **n:** number of subjects, **SD:** Standart Deviation, $p < .05$ is statistically significant

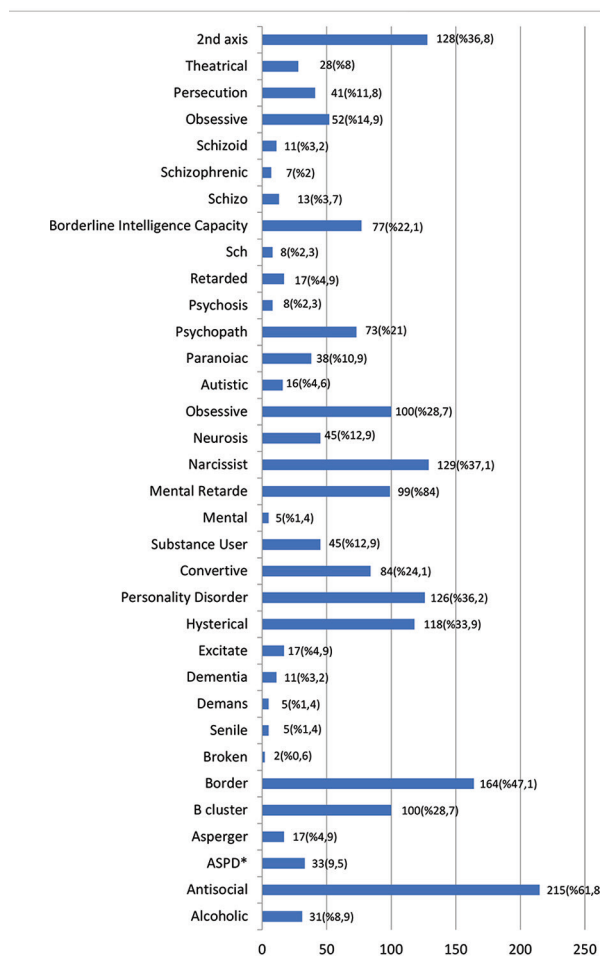


Figure 1. Rates of mental health terms used for stigmatizing purposes by mental health care professionals

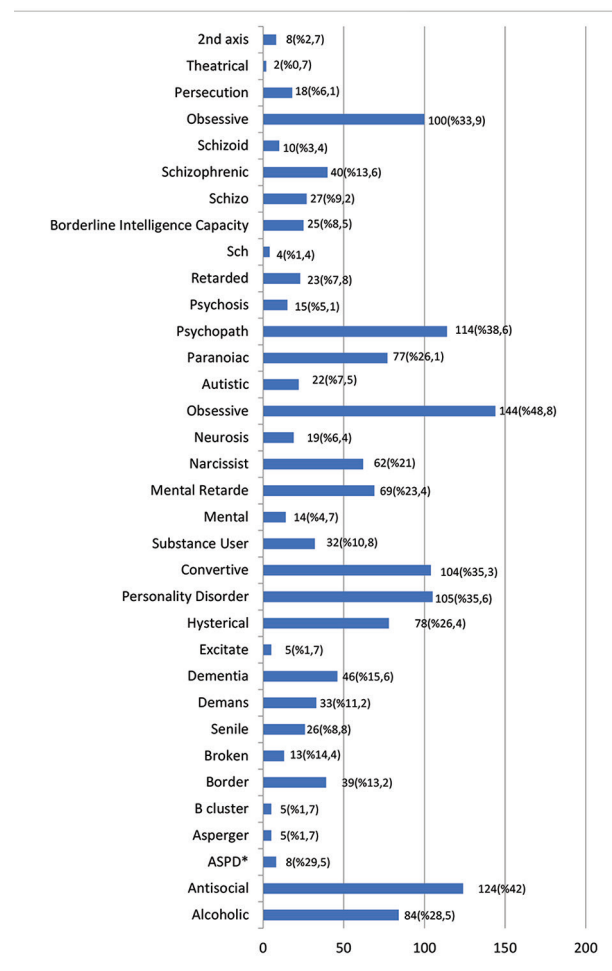


Figure 2. Rates of mental health terms used for stigmatizing purposes by other health care professionals statistically significant

DISCUSSION

This study shows that physicians and nurses working in mental health have more positive attitudes than those working in other health fields, while the number of stigmatizing words used by the physicians is higher than in nurses. MHCPs stigmatize individuals with mental illness less frequently (19, 25, 26, 27). So the conclusion is that spending more time with people with mental illness, having direct experience with them, and having experienced the disorder itself may be related to a positive attitude (25, 28, 29). Grana-dos-Gámez et al. explained that personal contact with patients with mental illness works as a good starting point in forming less-stigmatizing attitudes toward mental illness (29). The results of our study support the studies reporting that there are less stigmatizing attitudes among healthcare professionals who are in close contact with mental illnesses. However, other studies are reporting that close contact or being educated on this issue increases the stigmatizing attitude (30, 31). For example, nurses working in psychiatry clinics had a more social distance to schizophrenia patients than nurses working in other clinics (31). The reasons such as a lack of adequate training regarding treatment and identification of mental disorders, not knowing how to approach individuals with mental illness, having no interaction with these patients, the effects of stigmatization on the healthcare professional, patient and patient's relative, different qualifications of their working conditions may cause this negative attitude (19). Reports show that some stereotypical beliefs formed in healthcare professionals are similar to the ones in society. The misconception that individuals with mental illness are dangerous, unpredictable, violent, and strange are based on the media and historical misrepresentation and causes fear (8).

The belief that the cause of these illnesses are factors such as moral weakness, character, or willpower; laziness; malingering; lack of discipline, or lack of self-control can lead to hostility and accusation of healthcare professionals (8). Results might differ because of using different scales and because of diverse demographic characteristics. Another reason for these different results related to the relationship between stigma and close contact may also have potential implications for the desire for social acceptance (32). Participants may have answered the research questions in a socially acceptable way, especially considering that the issue of stigmatization is being researched. To reduce the effect of this confounding factor, we have ensured that our study was asked to answer anonymous.

Another result of our research is that MHCPs show more positive attitudes than OHCPs in terms of

both the short-term relationship sub-dimension (situations that do not threaten the personal space of the respondent; shopping, traveling, etc.) and long-term relationship sub-dimension (situations where there is a close social relationship; renting their home, working together in the same place, etc.) scale scores of AT-MIS. On the other hand, all healthcare professionals have a more negative attitude towards situations that require long-term and closer relationships than short-term ones with individuals with mental illness. In terms of social distance, MHCPs tend to have both positive and negative attitudes according to different variables in many situations requiring both short and long-term relationships, and they are also a mixed group in terms of attitudes (6, 19, 25, 33, 34). It can be argued that attitudes of all health professionals are negatively affected for situations that require a longer-term relationship with individuals with mental illness. Our results are similar to the results of Chen et al.'s research, which examines the attitudes of staff working in a psychiatric hospital towards people with mental illness and reported that they had less positive attitudes in a long-term relationship (35). Understandably, the participants behave more conservatively in this regard, as long-term situations requiring close relationships may depend on many factors, but it can be considered a situation with negative consequences. However, the strategy of using MHCPs as role models or opinion leaders in anti-stigmatizing campaigns will not be achieved without noticing and reducing their stigmatizing actions in their daily life (27). MHCPs should be aware that their attitudes are negative for long-term relationships towards people with mental illness, and should improve their knowledge about discrimination against them.

Considering that the language used has the power to shape the way people think, feel and act against each other, the role of non-discriminatory language use in combating stigmatization becomes crucial (36). Reports show that using language that emphasizes the individual instead of the disease (for example, "person with schizophrenia" instead of "schizophrenic") should be supported, and the opposite causes more stigmatizing attitudes and perceptions (36, 37). In our study, although the stigmatizing attitude scores were more positive, there was no difference between the MHCPs and OHCPs in terms of the number of stigmatizing words. This may be related to MHCPs use of psychiatric diagnoses as stigmatizing as OHCPs. Similar to the result of a single-center study in our country, our study shows that MHCPs use stigmatizing words mostly about personality traits and disorders (20). Personality disorders are labeled as "incurable, manipulative, trying to attract attention" by healthcare professionals. It is one of the potential stigmas among mental

disorders and the use of these words with stigmatizing purposes may cause negative effects in terms of treatment results (38, 39). When comparing occupational groups (physicians and nurses) in terms of the number of words used for stigmatizing purposes, physicians used more words than nurses.

We have not found a similar result in the literature on stigmatizing language use. In addition, this result is in contradiction with the studies reporting that the stigmatizing attitude decreases as the level of education increases (17). This may be because the number of terms that physicians know is higher than nurses and that they label the patient groups that they find challenging in their professional practices. There is also the possibility that the number of words used in a stigmatizing form doesn't necessarily mean more stigmatizing attitudes.

Strengths and Limitations

There are some limitations to our study. Since there is no valid and reliable scale to measure the use of stigmatizing language, a questionnaire about the use of stigmatizing language for mental illness was made for our study. In addition, because our study is cross-sectional, the direction of cause and effect relationships can not be confirmed. On the other hand, professionals who have chosen to participate in this study may be more sensitive and knowledgeable about stigmatization. In our sample, the fact that those working in mental health and those working in other fields are not similar in terms of gender may also have affected our results. There are inconsistent results in studies regarding the effect of gender on stigmatizing attitudes. There are studies suggesting that gender may affect attitudes towards individuals with mental disorders, as well as studies suggesting the contrary (9, 32, 39, 40). Another limitation is that other healthcare professionals are compared with mental healthcare professionals as a collective group, and they have not been evaluated separately as subgroups according to the branches they work in. In future studies, we suggest examining the differences between healthcare professionals' use of language and their attitudes towards patients with mental illness, considering the branches they work in. Despite all these limitations, we hope our study will contribute to the literature because of investigating the

stigmatizing attitudes of many healthcare professionals from many different centers according to similar studies conducted in our country before.

CONCLUSION

Although MHCPs have more positive attitudes against individuals with mental illness than OHCPs, this difference decreases when stigmatizing word usage and long-term relationship are evaluated. Negative attitudes should be reduced by providing anti-stigmatization training to healthcare professionals both at the beginning of their careers and in-service even though it might be difficult because of professionals' time constraints and different priorities. All healthcare professionals must be aware of their stigmatizing attitude and its consequences on the life of mentally ill individuals. We recommend creating regulations, which will enable healthcare professionals can be more exposed to these patients in both their education and work, as well as going through theoretical training on mental illnesses. An important part of fighting stigma is avoiding using stigmatizing language and expressions towards people with mental illnesses and stop using psychiatric diagnoses in derogatory meanings. All healthcare professionals need to be aware of the language and terms they use. Current anecdotal evidence for such processes suggests further study about interventions to decrease stigma in this area is needed.

Abbreviations

MHCPs — Mental Healthcare Professionals

OHCPs — Other Healthcare Professionals

ATMIS — Attitudes Towards Mentally Ills Scale

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Sažetak

STIGMATIZIRANJE DUŠEVNIH BOLESTI I KORIŠĆENJE JEZIKA KOJI PODRŽAVA TU VRSTU STIGME MEĐU LEKARIMA I MEDICINSKIM SESTRAMA U TURSKOJ

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Uvod: Opšte je poznato da se individue sa mentalnim bolestima suočavaju sa negativnim posledicama društvene stigmatizacije. Takođe su posebno osetljivi na ponašanje zdravstvenih radnika. Ova studija ima za cilj da ispita stigmatizirajuće stavove i upotrebu jezika stručnjaka za mentalno zdravlje i da ih uporedi sa stručnjacima koji to nisu.

Material i metode: Od ukupno 722 zdravstvena radnika zatraženo je da popune obrazac sa podacima o sociodemografskim karakteristikama, upitnik koji uključuje spisak stigmatizirajućih reči za mentalne bolesti i skalu stavova prema mentalnim bolestima (ATMIS).

Rezultati: Istraživanja pokazuju da stručnjaci za mentalno zdravlje imaju manje stigmatizirajuće stavove u poređenju sa drugim zdravstvenim radnicima ($p = .000$). Međutim, utvrđeno je da nema razlike u pogle-

du broja stigmatizirajućih reči koje koriste obe grupe, a najčešće korišćeni psihijatrijski dijagnostički izrazi sa svrhom stigmatizacije su poremećaji ličnosti. Broj stigmatizirajućih reči koje koriste lekari veći je od medicinskih sestara ($p = .000$). Stručnjaci za mentalno zdravlje imaju pozitivnije stavove i na skali kratkoročnih i dugoročnih odnosa. Obe grupe pokazuju da je srednja ocena niža u dugoročnim nego u kratkoročnim odnosima.

Zaključak: Rad u oblasti mentalnog zdravlja ne dovodi do pozitivnih promena u smislu upotrebe jezika u svrhe stigmatizacije i smanjenja stigmatizirajućih stavova u dugotrajnoj vezi sa pojedincima sa mentalnim bolestima. Preporučuje se povećanje svesti lekara o upotrebi stigmatizirajućeg jezika.

Ključne reči: Stigmatizacija, stavovi, lekar, medicinska sestra, mentalne bolesti, jezik.

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LOWER EXTREMITY PROBLEMS AND RELATED SURGICAL PROCEDURES BEFORE AND DURING THE COVID-19 PANDEMIC IN A TERTIARY HEALTHCARE INSTITUTION

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Abstract: Aim: This study aims to investigate whether there was a change in the number of elective surgical procedures and outpatient presentations between the first and second episodes of COVID-19 in a tertiary center in Turkey.

Methods: This retrospective study included data concerning patients presenting to the outpatient and emergency departments of orthopedics and vascular surgery and undergoing surgery in these departments during the first (March-April, 2020) and the second episodes (November-December, 2020) of COVID-19 in a tertiary center in Turkey.

Results: When the procedures related to orthopedics and traumatology were examined, compared to 2019, the total number of examinations, emergency patients, surgeries, total knee replacement, total hip replacement decreased in 2020, it was seen that the numbers of lower extremity fracture and lower limb amputation increased (both in March-April and November-December periods). When lower extremity vascular procedures were analyzed, we found that the number of all procedures decreased in 2020 compared to 2019 (both in March-April and November-December periods).

Conclusion: Our findings show there was a slight increase in admissions to outpatient and emergency departments of orthopedics and vascular surgery department as well as the number of surgical procedures performed during the second episode of the COVID-19 outbreak compared to the first episode. However, both outpatient and emergency department admissions were lower than that of the pre-COVID era, as well as the number of surgical procedures.

Keywords: orthopedic procedures, SARS-CoV-2, vascular surgical procedures.

INTRODUCTION

The first cases of severe pneumonia with unknown etiology were seen in Wuhan, China, at the end of 2019 (1). Fever, shortness of breath, sore throat, and cough were the initial symptoms (2). Chinese Center for Disease Control and Prevention (CDC) identified a novel coronavirus from the throat swab sample from a patient presenting with these symptoms. World Health Organization (WHO) further named the novel coronavirus as 2019nCoV (3). The International Committee on Taxonomy of Viruses renamed the virus a severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by February 2020 (4). The epidemic disease caused by SARS-CoV-2 was further announced by WHO as coronavirus disease 2019 (COVID-19). COVID-19 was qualified as a pandemic by the World Health Organization (WHO) on March 11, 2020 (5).

By the end of February 2021, about 10 million people have been infected by SARS-CoV-2. Approximately 2.3 million deaths were caused by COVID-19 globally (6). The initial phase of COVID-19 pandemics was associated with a stunning healthcare network due to the excessive burden on emergency departments and intensive care units. Almost all countries worldwide declared a state of alarm against the increasing number of COVID-19 cases to reduce the heavy burden on the healthcare system. Elective interventional and surgical procedures were also postponed due to the burden on the healthcare systems loaded by COVID-19 cases (7). People's fear of being infected by SARS-CoV-2, with no reliable treatment provided at the initial phase of the pandemic, restricted individuals seeking medical care for their acute or chronic diseases other than COVID-19. Several reports have shown a significant

decline in the number of individuals presenting to the emergency department even with symptoms of potentially life-threatening conditions such as acute coronary syndromes compared to the pre-pandemics era (8). During the COVID-19 pandemic, governments re-organized healthcare systems according to accumulating evidence concerning the spread and treatment of the COVID-19. There was a relative decline in COVID-19 cases in Turkey by June 2020. A gradual loosening in social restriction measurements was then carried out. However, the second episode of the COVID-19 outbreak was observed again between November and December 2020 (9). Although there was a significant decline in the numbers of elective surgical procedures and outpatient presentations in the first episode of COVID-19, whether there was a different trend in this second episode of COVID-19 in Turkey is unknown.

This study aimed to investigate whether there was a change in the number of elective surgical procedures and outpatient presentations between the first and second episode of COVID-19 in a tertiary center in Turkey.

MATERIALS AND METHODS

Study setting and design

This retrospective study included data concerning the patients presenting to outpatient and emergency departments of orthopedics and vascular surgery and undergoing surgery in these departments in the first (March-April, 2020) and second episodes (November-December, 2020) of COVID-19 in a tertiary center in Turkey.

Methods

All patients scheduled for surgery at the aforementioned departments underwent PCR tests for COVID-19, and those with positive PCR test results were excluded. Written informed consent was obtained from all sub-

jects. Ethical approval for the study was obtained from Ordu University Clinical Research Ethics Committee (No 2021/72). The study was conducted in accordance with the Helsinki declaration. Statistical data, concerning the outpatient presentation and surgical procedures performed in orthopedics and vascular surgery departments at the same time intervals of 2019, were retrieved from the institutional digital database.

The primary outcome measure of this study was the difference in the outpatient presentation numbers and the number of the surgical procedures performed at orthopedics and vascular surgery departments following the COVID 19 outbreak. The secondary outcome measure was the difference in the outpatient presentation numbers and the number of the surgical procedures performed at orthopedics and vascular surgery departments between the first and the second episode of the COVID-19 outbreak in Turkey.

Statistical analysis

All analyses were performed on SPSS v21 (SPSS Inc., Chicago, IL, USA). Data are given as frequency (percentage) for categorical variables.

RESULTS

When the procedures related to orthopedics and traumatology are examined, compared to 2019, while the total number of examinations, emergency patients, surgeries, total knee replacement, total hip replacement decreased in 2020, it was seen that the numbers of lower extremity fracture and lower limb amputation increased (both in March-April and November-December periods) (Table 1).

When lower extremity vascular procedures were analyzed, we found that the number of all procedures decreased in 2020 compared to 2019 (both in March-April and November-December periods) (Table 2).

Table 1. Distribution of orthopedics and traumatology examinations and surgeries according to the period

	Period	
	March – April	November – December
Total number of examinations	4191/1741	6318/2249
Total number of emergency patients	35/13	36/16
Total number of surgeries	251/130	252/145
Type of surgery		
Total knee replacement	68/9	48/16
Total hip replacement	11/1	12/5
Lower extremity fracture	19/34	41/50
Lower limb amputation	6/10	3/8

Data are given as frequency (2019/2020).

Table 2. Distribution of lower extremity vascular examinations and surgeries according to the period

	Period	
	March – April	November – December
Total number of examinations	811/104	641/310
Total number of emergency patients	16/2	11/6
Type of surgery		
Deep vein thrombosis	7/0	12/4
Varicosis	72/0	60/0
Embolectomy	4/1	3/2
Fem-Pop bypass	8/0	9/1
Extra-anatomic bypass	1/0	2/0
Endovascular therapy	28/0	32/5

Data are given as frequency (2019/2020).

Our findings show that the COVID-19 outbreak can be associated with a decline in presentations in the emergency department and outpatient clinics of orthopedics and vascular surgery. An increase in the number of patients, presenting to the emergency department and outpatient clinics of orthopedics and vascular sur-

gery, was observed from the first to the second episode of the COVID-19 outbreak; however, it was still lower than that of the same period of 2019 (Figure 1 and 2).

The number of patients undergoing intervention or surgery for deep vein thrombosis, varicose veins, or lower extremity arterial disease (femoropopliteal

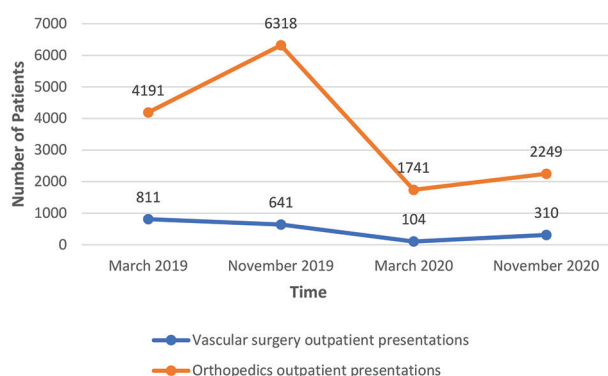


Figure 1. The change in the number of admissions to the outpatient clinic of orthopedics and vascular surgery before and after the first and the second episodes of the COVID-19

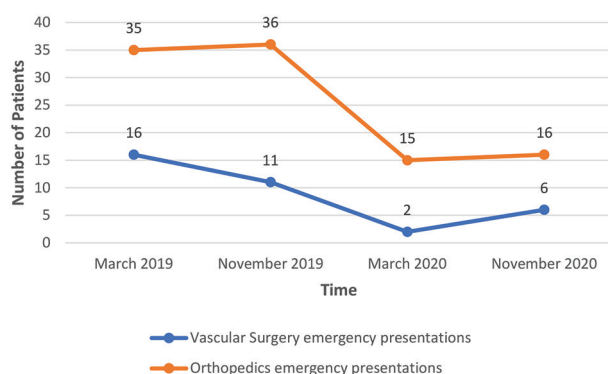
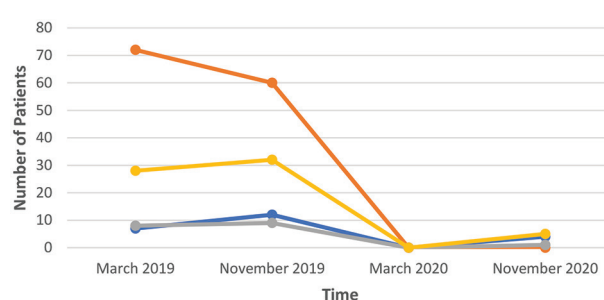
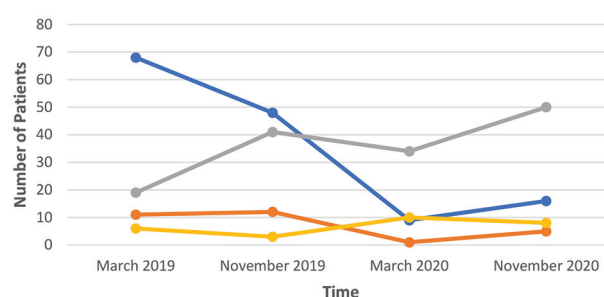


Figure 2. The change in the number of admissions to the emergency department for musculoskeletal and vascular causes before and after the first and the second episodes of the COVID-19



a) Deep vein thrombosis Varicose vein surgery
Femoropopliteal bypass Endovascular treatment



b) Total knee replacement Total hip replacement
Lower extremity fracture Lower extremity amputation

Figure 3. (a) The change in the number of interventional and surgical procedures performed by vascular surgery departments before and after the first and the second episodes of the COVID-19.

(b) The change in the number of interventional and surgical procedures performed by orthopedics departments before and after the first and the second episodes of the COVID-19

bypass, endovascular treatment) demonstrated a steep decline following the COVID-19 outbreak, although a slight increase was observed from the first to the second episode. However, the number of patients undergoing interventions for the aforementioned conditions was still lower at the second episode of COVID-19 compared to the same period of 2019 (Figure 3).

A similar trend was observed in orthopedics surgery. The number of patients undergoing total knee and hip replacement and lower extremity amputation demonstrated a steep decline following the COVID-19 outbreak, although a slight increase was observed from the first to the second episode. As an interesting finding, the number of patients presenting with lower extremity fractures increased following the COVID-19 outbreak, and this increase continued at the second episode of the COVID-19 outbreak (Figure 3).

DISCUSSION

Findings show that the number of patients admitted to the emergency department and outpatient clinic on our institute for vascular surgery and orthopedics in the COVID-19 era was lower compared to the same interval of last year. However, there was a slight increase in presentations to the emergency department and outpatient clinic of orthopedics and vascular surgery departments from the first to the second episode of the COVID-19 outbreak. Our findings also show that the number of patients presenting for surgical and interventional procedures to the orthopedics and vascular surgery departments demonstrated a steep decline following the COVID-19 outbreak. However, a slight increase was observed from the first to the second episode. Nevertheless, the number of patients undergoing surgical procedures in orthopedics and vascular surgery departments in the second episode of the COVID-19 outbreak was still lower than that of the same period of 2019.

The COVID-19 outbreak led to significant changes in health policies and influenced the public to seek medical help even for acute life-threatening conditions. Previous data from France, Spain, Austria, and United States have shown that admissions for acute coronary syndromes and the number of emergency cardiac interventions demonstrated a significant decline following the emergence of the COVID-19 outbreak (10-13). A recent study from Turkey has shown a similar decline in the number of patients admitted to the emergency department with cardiovascular symptoms, acute heart failure, acute coronary syndrome, STEMI, and in diagnostic angiographies, peripheral endovascular interventions, and cardiac surgeries (8). This was somewhat explained by the strict contain-

ment measures that made individuals hesitate to admit to hospitals to prevent being infected by the SARS-CoV-2. The declaration of the state of alarm by many countries and related containment measures with the public-health messages have resulted in self-censorship to prevent possible contamination in hospitals (14). However, the acute burden on the healthcare system resulting from high numbers of COVID-19 admissions led to a change in the structure of the healthcare organization in hospitals. Many outpatient clinics and ICU units were reserved for diagnosing and managing COVID-19 patients (15, 16). However, this further led to collateral damage which could be described as the increase in comorbidities and deaths caused by severe medical conditions that require hospital admission and emergent intervention.

Studies have been conducted to examine the number of hospital admissions during the early period of the COVID-19 pandemic. A study conducted in a university hospital emergency in Turkey determined there was a decrease in the rate of total admissions to the emergency department (from 49.9% to 33.2%) in April compared to March when the first case was announced (17). The results of the studies evaluating the decrease in the number of hospital admissions compared to the previous year in the first periods of the COVID-19 pandemic were as follows, 42% decrease in the USA between March 29 and April 25, 2020 (18), 50% decrease in the UK between March 2 and May 3 (19), 47% decrease in France between March 23-April 5 (20). Similarly, in studies conducted in many countries in the later stages of the pandemic, it was reported that there was a significant decrease in hospital admissions (21, 22, 23). The results of our study were similar to the hospital admissions trend in different countries.

Several vascular and orthopedics conditions require surgical or interventional procedures for management. These include lower extremity fractures, lower extremity amputations, deep vein thrombosis that requires pharmaco-mechanical treatment, and lower extremity arterial disease which should be managed by femoropopliteal bypass and endovascular strategies (24, 25, 26). This study showed that the COVID-19 outbreak has led to increased admissions for bone fractures and amputation. The common belief was that the number of procedures has increased because patients with peripheral artery disease cannot be fully treated with medical or therapeutic intervention during the pandemic period.

By the course of the COVID-19 pandemics, the containment measures and the state of alarm brought favorable results indicated by the reduced number of admissions for COVID-19 (27-30). In addition, the collateral damage and the increased morbidity and

mortality resulting from other critical medical conditions led to a change in health policies (31-34). Individuals with symptoms of critical medical conditions were then encouraged to present in emergency departments for seeking medical help. However, the second episode of the COVID-19 outbreak occurred between November and December 2020. Our findings show that public experience derived from the first episode and establishment of preventative measures led to more outpatient clinic and emergency department admissions during the second episode. However, the number of patients in outpatient clinics and emergency departments, as well as the interventional and surgical procedures performed during the second episode of the COVID-19, were still lower than that last year. This may still lead to an increase in morbidity and mortality from serious clinical conditions other than COVID-19. Given that an integrated healthcare system should not only focus on the COVID-19 outbreak but also consider the consequences of other serious clinical conditions, the healthcare system should seek ways to manage acute musculoskeletal and vascular disorders, which may potentially be lethal, during pandemics.

Sažetak

PROBLEMI DONJIH EKSTREMITETA I HIRURŠKI ZAHVATI POVEZANI SA NJIMA PRE I TOKOM PANDEMIJE COVID-19 U TERCIJARNOJ ZDRAVSTVENOJ USTANOVI

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Cilj: Ova studija ima za cilj da istraži da li je došlo do promene u broju elektivnih hirurških zahvata i ambulantnih pregleda između prve i druge epizode COVID-19 u terciarnom centru u Turskoj.

Metode: Ova retrospektivna studija obuhvatila je podatke o pacijentima koji su se javljali ambulantno i na odeljenja urgentne ortopedije i vaskularne hirurgije i bili operisani na tim odeljenjima tokom prve (mart-april 2020.) i druge epizode (novembar-decembar 2020.) COVID-a -19 u terciarnom centru u Turskoj.

Rezultati: Kada su pregledani zahvati vezani za ortopediju i traumatologiju, u odnosu na 2019. godinu, ukupan broj pregleda, hitnih pacijenata, operacija, totalne zamene kolena, totalne zamene kuka se smanjio 2020. godine, uočeno je da je broj preloma donjih ekstremiteta i amputacija donjih ekstremiteta povećan (i

CONCLUSION

Our findings show a slight increase in admissions to outpatient and emergency departments of orthopedics and vascular surgery department along with surgical procedures performed by these disciplines during the second episode of the COVID-19 outbreak compared to the first episode. That said, outpatient and emergency department admissions and the number of surgical procedures were still lower than in the pre-COVID era. The healthcare system should focus on finding ways to manage serious clinical conditions other than COVID-19 to reduce the morbidity and mortality resulting from these conditions.

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u periodu mart-april i u periodu novembar-decembar). Kada su analizirane vaskularne procedure donjih ekstremiteta, otkrili smo da se broj svih zahvata smanjio u 2020. u odnosu na 2019. (u periodu mart-april i novembar-decembar).

Zaključak: Naši nalazi pokazuju da je došlo do blagog povećanja ambulantnih pregleda i prijema na odeljenja urgentne ortopedije i vaskularne hirurgije, kao i broja hirurških zahvata obavljenih tokom druge epizode izbijanja KOVID-19 u odnosu na prvu epizodu. Međutim, broj ambulantnih i hitnih prijema bio je manji nego u doba pre KOVID-a, kao i broj hirurških zahvata.

Ključne reči: ortopedski zahvati, SARS-CoV-2, vaskularni hirurški zahvati.

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FASTING BLOOD GLUCOSE LEVEL IN PATIENTS PRESENTING WITH ERECTILE DYSFUNCTION

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Abstract: Introduction: An increase in diabetes mellitus (DM) causes different complaints and concerns. This retrospective cross-sectional study aimed to test fasting blood glucose (FBG) levels in patients presenting with erectile dysfunction (ED).

Materials and Methods: The patients included in the study were divided into two groups. Test group X consisted of 92 male patients who were referred to the urology outpatient clinic with the complaint of ED and did not have a previous DM history. Control group Y was formed with the same number of patients who applied to the internal medicine outpatient clinic for other complaints.

Results: The mean FBG levels were 133.7 ± 77.3 mg/dL in the group with ED and 102.7 ± 24.3 mg/dL in the control group. There was a significant correlation between the two groups in impaired fasting glucose (IFG) values ($p < 0.05$).

Conclusion: Therefore, the measurement of fasting blood sugar is an essential diagnostic step in evaluating patients with ED.

Keywords: fasting blood glucose, erectile dysfunction, diabetes mellitus.

INTRODUCTION

Erectile dysfunction (ED-impotence) is the inability to achieve or maintain an adequate erection for satisfactory sexual performance (1). ED is a common condition since 22% of men in the United States experience it and will affect 322 million males worldwide by 2025 (2). The general belief is that 50% of men older than 40 years have ED (1), which impairs the quality of life to a great extent (3).

The emergence of clinical signs of ED is quite complicated. The causes can be roughly classified as organic, psychological, and mixed. ED occurs due to

any ailments during physiological processes, such as the central nervous system, peripheral nervous system, hormonal system, and vascular systems. The most crucial cause is vasculogenic etiology. Some genetic factors also play the same role (4). The incidence of ED increases with age, similar to the increase in other age-related diseases (coronary artery disease, hypertension, diabetes). Among these, diabetes mellitus (DM) is the most common risk factor for ED. ED has been reported 4.2 times more in diabetic patients than in the non-diabetic population. In patients with ED, the rate of hypertension was found to be 60%, hypercholesterolemia 40%, coronary artery disease 20%, DM 11%, and depression 68% (5).

DM is a known cause of ED. Many systematic reviews and meta-analyses have revealed that ED prevalence in type 1 diabetes is 37.5% and 66.3% in type 2 diabetes. The vascular and neurogenic mechanisms cause this disorder (6, 7).

Different diagnostic methods for diabetes are defined by the World Health Organization (WHO) and the International Diabetes Federation (IDF), such as fasting blood glucose (FBG), oral glucose tolerance test (OGTT), second-hour plasma glucose (PG), hemoglobin A1C, and random PG(8). Impaired Fasting Glucose (IFG) is not enough to identify individuals at risk in an easy way. IFG is a transition between normal glucose levels and impaired glucose tolerance (IGT) (8). Even this level of hyperglycemia is an increased risk factor for metabolic diseases.

This study aimed to determine fasting blood sugar levels in patients presented with ED for the first time.

Materials and Methods

The study was performed in an outpatient clinic from patients followed up between October 2017 and

December 2017. The patients included in the study were divided into two groups. Test group X consisted of 92 male patients who were referred to the urology outpatient clinic with the complaint of ED and no previous DM history. Control group Y was formed with the same number of patients applied to the internal medicine outpatient clinic for other complaints. We recorded the age, gender, and FBG levels of the patients. According to IDF 2015 data, those with FBG levels of 100-125 mg/dL were considered as IFG and those with FBG levels of > 126 mg/dL as DM.

Statistical analyses were performed in the NCSS (Number Cruncher Statistical System) 2007 (Kaysville, Utah, USA) program. We used descriptive statistical methods (frequency, percentage, mean, and standard deviation) to assess the data, and the relationship between variables was assessed using Spearman's rho correlation test. The significance level for all analyses was selected as $p < 0.05$.

Ethics statement

Since our study is retrospectively conducted, we did not get informed consent forms from patients. Approval was obtained from the local ethics committee (approval#16867222/604.01.01) and conducted according to the Helsinki Declaration and Good Clinical Practices guideline.

Name of the institution where the work was done:

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Table 1. Distribution of demographic characteristics

	No ED	ED
Age Mean $\pm$ SD	45.65 $\pm$ 10.52	46.91 $\pm$ 10.31
Fasting blood glucose (FBG) Mean $\pm$ SD	102.68 $\pm$ 24.26	133.65 $\pm$ 77.33

RESULTS

A total of 184 subjects were included in the study by a systematic random sampling method. All patients were male. The mean age was 45.78 ± 10.3 years in both groups (Table 1). The mean FBG levels were 133.7 ± 77.3 mg/dL in the group with ED and 102.7 ± 24.3 mg/dL in the control group. There was a significant correlation between the two groups in IFG values ($p < 0.05$) (Table 2).

DISCUSSION

DM is known to be in the etiology of ED. Previous studies demonstrated that ED might be among the first symptoms of coronary artery disease (9). We aimed to evaluate fasting blood glucose levels and their relation to ED presentation.

The risk of developing type 2 DM in the population with IFG between 3 and 5 years is 51.3%, and this risk in the IFG and IGT population within five years is 33-36%. Prediabetes is seen in 25-62% of patients with idiopathic peripheral neuropathy. Neuropathy is seen in 13-21% of the population with impaired glucose tolerance (10).

ED occurs as a consequence of the development of autonomic neuropathy in diabetic patients (11). Neuropathy presenting in IFG and early DM is similar. In IFG, neuropathy is observed in 30-50% of patients with IGT and about 40% of early diabetics, suggesting early neuropathy involvement. Between 25 and 62% of patients with idiopathic peripheral neuropathy are prediabetes. 13 to 21% of IGT patients also have neuropathic findings, and 11 to 25% of patients with prediabetes have peripheral neuropathy. Neuropathic pain has been reported in 13 to 21% of patients (12).

Patients with DM longer than ten years tend three times more likely to develop ED than those with a history of fewer than five years (13). There is also increasing evidence that ED is associated with glycemic control. The mean FBG level measured was 133.7 ± 77.3 mg/dL in the group of ED complaints and 102.7 ± 24.3 mg/dL in the control group.

Table 2. Fasting blood glucose levels

Variable	No ED	ED	p
Fasting blood glucose (FBG)	n_1 (%)	n_2 (%)	
Normoglycemic (< 100 mg/dL)	53 (28.8%)	41 (22.3%)	$p = 0.18$ (> 0.05)
Impaired fasting glucose (IFG) (100-126 mg/dL)	39 (21.1%)	51 (27.8%)	
Total	92	92	$p = 0.01$ (< 0.05)

ED occurs over time in more than 50% of IGT patients and 10-18% of the diabetic population. Metabolic tissue damage caused by hyperglycemia causes microvascular complications (14, 15). Therefore, FBG should be investigated in men who have ED complaints (16). Other studies observed similar results. ED is associated not only with undiagnosed DM but also with IFG (17).

ED develops due to atherosclerosis and neuropathic changes in the corporal erectile tissue due to changes, such as smooth muscle degeneration, endothelial cell dysfunction, and abnormal collagen deposition (17). Autonomic neuropathy causes impaired endothelium-dependent and independent vasodilatation without clinical macrovascular symptoms. Undiagnosed autonomic neuropathy increases the risk of ED in peripheral neuropathy. Blood flow becomes insufficient due to endothelial dysfunction and autonomic neuropathy (18). This condition is a critical marker for screening for silent coronary artery disease (CAD) (19).

IFG is only a clinical presumptive diagnosis, not a clinical entity. It must be followed up for the long term, and necessary precautions regarding DM should be taken. Available data suggest that there is a lower risk for progression of IFG to diabetes (15). This study observed that the IFG and IGT rates were higher in the patients with a complaint of ED. Our results were also similar to the previous studies in the literature (17, 20).

The study of Olafimihan et al. showed that IFG was statistically associated with ED (about 60% of this group had ED) (20). Other studies have reported similar results in the literature (17). IFG is not a clinical entity; it is a risk category on early medical presentation of diabetes and cardiovascular diseases.

The impact of ED on social life is significant. The number of patients is low due to sexual taboos, especially in developing and underdeveloped countries.

Sažetak

NIVO GLUKOZE U KRVU KOD PACIJENATA SA EREKTILNOM DISFUNKCIJOM

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Uvod: Porast dijabetesa (DM) izaziva različite žalbe i zabrinutosti. Ova retrospektivna studija preseka imala je za cilj ispitivanje nivoa glukoze u krvi natašte (FBG) kod pacijenata sa erektilnom disfunkcijom (ED).

Materijali i metode: Pacijenti uključeni u studiju bili su podeljeni u dve grupe. Grupu ispitanika, označenu kao grupu X činilo je 92 pacijenta muškog pola koji su upućeni u urološku ambulantu sa tegobama vezanim za erektilnu disfunkciju ED bez anamnestičkih podataka vezanih za dijabetes melitus. Kontrolna grupa Y je

Only 10 percent of men between 18 and 60 in Turkey reach out to a doctor with ED complaints. In our study, the control group did not ask for help for this kind of complaint, so this rate is more than we found it.

In this study, the blood sugar level in the ED group was higher than in the control group. Early medical presentations, such as IFG and ED, are risk factors for diabetes (21, 22).

These findings have crucial clinical implications for physicians. Asking questions that lead to the screening of these risk groups related to sexual health would make a change to prevent disease progression.

CONCLUSION

The first symptom in patients may be ED. Therefore, measuring fasting blood glucose is an essential diagnostic step.

Abbreviation

DM — diabetes mellitus

FBG — fasting blood glucose

ED — erectile dysfunction

IFG — impaired fasting glucose

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formirana sa istim brojem pacijenata koji su se obratili internističkoj ambulanti zbog drugih tegoba.

Rezultati: Prosečni nivoi FBG bili su $133,7 \pm 77,3$ mg/dL u grupi sa ED i $102,7 \pm 24,3$ mg/dL u kontrolnoj grupi. Postojala je značajna korelacija između dve grupe u oslabljenim vrednostima glukoze (IFG) ($p < 0,05$).

Zaključak: Merenje šećera u krvi natašte bitan dijagnostički korak u proceni pacijenata sa ED.

Ključne reči: glukoza u krvi natašte, erektilna disfunkcija, dijabetes melitus.

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MALIGNANT TUMORS OF THE APPENDIX: EVALUATION OF 6748 APPENDECTOMY CASES

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Abstract: Objective: Appendiceal neoplasms are usually diagnosed incidentally after appendectomy for the treatment of acute appendicitis. This study aimed to present incidental malignancy cases that we detected retrospectively by examining our appendectomy results.

Materials and Methods: 6748 appendectomy cases performed in Van Research and Training Hospital, Department of Surgery, Turkey, between January 2016 and January 2020, were retrospectively analyzed. After histopathological analysis, 22 patients were found to have low-grade appendiceal mucinous neoplasia (LAMN) and appendiceal neuroendocrine tumors (NET). The complete data of the patients were recorded, including the demographic, laboratory, imaging, and histopathological data.

Results: The median age of 22 patients included in the study was 39 years (18-72 years), and 14 (63.6%) were women. Malignancy was suspected in only 4 (18%) patients during exploration. Histologically, the tumor was located distally in 19 (83.4%) patients and was located at the base of the appendix in 3 patients. Histopathological analysis; resulted as grade 1 NET in 15 patients, LAMN in 5 patients, grade 2 NET in 1 patient, and mixed type (mucinous + neuroendocrine tumor) in 1 patient. The Median follow-up time was 45.5 months (range: 26-53). During the follow-up, one of our patients who underwent right hemicolectomy due to the tumor at the surgical margin was diagnosed with pseudomyxoma peritonei.

Conclusion: Appendiceal neoplasms are often diagnosed in the results of postoperative pathological examinations. In patients with suspected malignancy during the perioperative examination, it is crucial to carefully examine intra-abdominal organs and avoid surgical margin positivity. Malignancy risks should always be kept in mind in non-routine appendix appearances.

Keywords: appendix, appendiceal, malignancy, tumor.

INTRODUCTION

Appendiceal neoplasms are usually seen after appendectomy for acute appendicitis (1). It is uncommon to diagnose it before or during surgery. Although appendectomy for acute appendicitis is generally an adequate treatment for most of these neoplasms, surgeons cannot offer different surgical options without definitive pathological results (2). Depending on the histopathology, size, and surgical margin of the tumor, appendectomy or right hemicolectomy are surgical treatment options. Adenocarcinomas, mucinous neoplasms, and neuroendocrine tumors (NET) are types of primary appendix neoplasm histopathology. NET is the most common type of these neoplasms (3).

MATERIALS and METHODS

Between January 2016 and January 2020, 6748 appendectomies were performed, with the diagnosis of acute appendicitis at Van Research and Training Hospital, Department of Surgery, Turkey. Patients who underwent appendectomy for a reason other than acute appendicitis were excluded from the study. These medical records were evaluated retrospectively. After histopathological analysis of appendectomy specimens, 22 patients were found to have low-grade mucinous neoplasia and appendiceal neuroendocrine tumors. A retrospective database including gender, age, preoperative radiological diagnosis, symptom duration, intraoperative surgical findings, histopathological type of tumors, tumor grades, diameters, and localizations were obtained. All patients were invited to check the wound site at the postoperative 1st week and the pathology report on the 15th day. If the pre-

malignant lesion was detected in the pathology report, the patient was called for a 1st and 6th months post-operative control. Total colonoscopy was performed for suspected synchronous colorectal cancers in cases with appendiceal neoplasia.

Statistical analyzes

All statistical analyzes were performed using SPSS software version 22 for Windows (SPSS Inc., Chicago, IL, USA), and the results were considered statistically significant if $P < 0.05$. Continuous variables were expressed as median (range), and categorical variables were expressed as frequency (percentage).

Approval was obtained from the ethics committee of our center for a retrospective study (2020/20 – 08.10.2020).

RESULTS

The data of 6748 surgical patients diagnosed with acute appendicitis were retrospectively analyzed, 22 patients were found to have appendix neoplasms (0.32%). The median age of these 22 patients was 39 years (range, 18-72 years), and 14 (63.6%) were female. All patients presented with clinical and radiological appendicitis. The median symptom duration was 2 (1-3) days. Twenty patients had localized pain (right lower quadrant), two patients had pain in all four quadrants of the abdomen.

Tenderness and rebound were detected in the right lower quadrant in all patients. As radiological imaging, ultrasonography (USG) in 10 patients, computed tomography (CT) in 11 patients, and both methods were used in 1 patient. The median appendix diameter was 10 (7-36) mm in preoperative imaging.

Malignancy was suspected in 4 (18%) patients during exploration. The mean appendix diameter in the preoperative examinations of these four patients was 28.5 ± 11.8 mm. Imaging tests showed an increase in the diameter of the appendix, which was significant in terms of suspicion of malignancy in the perioperative



Figure 1. Appendectomy specimen with multiple lymphadenopathies in the mesoappendix

examination. At the same time, there was a statistical correlation between histological tumor size and malignant appearance in perioperative control (Figure 1). The histological median tumor diameter in the entire group was 0.65 cm (range: 0.2–7 cm). While the mean tumor diameter of the patients suspected of tumor on exploration was 48.2 ± 23.93 mm, it was 8.56 ± 6.69 mm in the others.

Histologically, the tumor was located distally in 19 (83.4%) patients and at the base of the appendix in 3 patients. Histopathological tumor size and surgical margin positivity were unrelated. The surgical margin was positive in 2 patients with radix located, and radix location was significant in terms of the risk of surgical margin positivity. Although it has been determined that radix located tumors are statistically significant in terms of malignant appearance on exploration, it may be thought that the mean diameter of these neoplasms being larger than those located distally may contribute to this result. A right hemicolectomy was performed in patients with positive surgical margins.

Table 1. Histopathological features of tumors

	Neuroendocrine tumor	Mucinous neoplasia	Mixt type tumor
Total patient number	16	5	1
Sex (Female)	8	3	1
Localisation (Proximal)	1	2	No
Mesoappendix invasion	8	1	1
Lenfovacular invasion	2	1	1
Pseudomiksoma peritonei	No	No	1

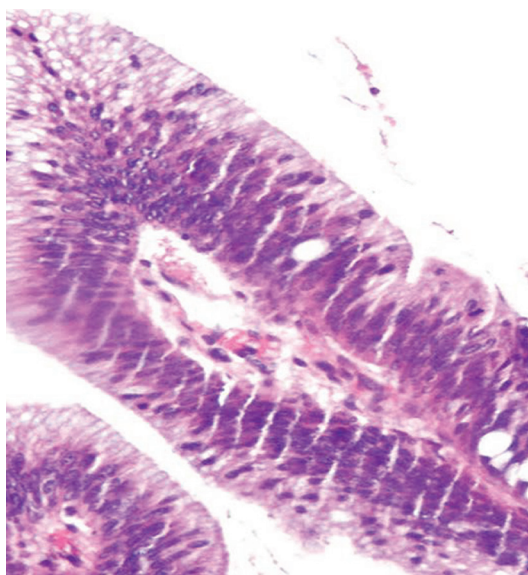


Figure 2. The villi of an appendiceal mucinous adenoma are lined by pseudostratified nuclei with mild hyperchromasia (X400 Hematoxylin and eosin)

Histopathological analysis; It resulted as grade 1 neuroendocrine tumor in 15 patients, low-grade mucinous neoplasia in 5 patients (Figure 2), grade 2 neuroendocrine tumor in 1 patient, and mixed type (mucinous + neuroendocrine tumor) in 1 patient (Table 1). All Grade 1 NETs were located distally. Therefore, there was a statistically significant relationship between histopathology and tumor location. Due to its distal location and small histological tumor size, no perioperative malignancy was suspected in any grade 1 NET case.

Mesoappendix invasion was detected in 10 patients (45.5%). Median mitotic index and Ki67 levels were 1 (0-4) and 1 (1-10), respectively.

Open appendectomy was performed in 16 patients and laparoscopic appendectomy in 6 patients. In the preoperative imaging, the patient with an appendix diameter of 36 mm had a conversion from laparoscopy to open (Figure 3). Only mesoappendix invasion did not require re-operation in any of our patients.

The Median follow-up time was 45.5 months (range: 26-53). During the follow-up, one of our patients who underwent right hemicolectomy due to tumor positivity at the surgical margin was diagnosed with pseudomyxoma peritonei. The patient, who is on oncology follow-up, is in the postoperative 19th month. Surgical complications and mortality were not observed in any of our patients during our follow-up.

DISCUSSION

Appendix tumors are rare and usually asymptomatic. They are detected incidentally, either during



Figure 3. The patient with an appendix diameter of 36 mm had a conversion from laparoscopy to open. The black arrow shows the edematous appendix tissue

surgery or after a pathological examination of a resected appendix sample. The most common type of appendix cancer is neuroendocrine tumors that make up about 60% of all appendix tumors. The incidence of appendix NET in patients undergoing appendectomy is 0.30% -2.27% (4). Barut et al. in their study, 12 (0.43%) NET cases were found in 2778 patients (2). In our series, there was a 0.23% appendix NET rate which was lower than the literature, and all operated patients presented with symptoms of acute appendicitis. None of these patients showed signs of carcinoid syndrome.

Appendix NETs are more common in women than in men (5). Similar to this study, 56.2% of our patients were also women. Most NETs are located at the tip of the appendix. Most of the cases are smaller than 1 cm, the malignant potential is directly related to tumor size, and metastasis is extremely rare in tumors smaller than 1 cm (6). In our patient group, the median tumor diameter was 0.65 cm (range: 0.2-7 cm) and was localized at the tip of the appendix in 83.4%.

Neuroendocrine tumors, appendectomy alone is a sufficient treatment if the tumor size is less than 1 cm. A right hemicolectomy is recommended for tumors > 2 cm. However, the optimal treatment of 1-2 cm tumors is still controversial (5). In our case series, appendectomy was considered an adequate treatment for neuroendocrine tumors. Raoof et al. reported that the probability of nodal metastasis was 2.7% in tumors smaller than 1 cm, 31.0% in tumors with a diameter of 1.1-2.0 cm, and 64% in tumors > 2 cm, and they suspected that the number of lymph nodes was a prognostic factor for well-differentiated neuroendocrine tumors (3). In our

series, 2 of the neuroendocrine tumors were 26 and 60 mm and the others were smaller than 12 mm; Ki-67 index rates were between 1-2% and mitosis numbers between 0-2. We performed a right hemicolectomy in cases with neuroendocrine tumors larger than 2 cm due to the positive surgical margins.

Surgeons generally do not recognize appendix tumors, especially neuroendocrine tumors, and preoperative radiological examination may not be effective in their diagnosis. In our series, malignancy was suspected in only 4 (18%) patients perioperatively. Two of these patients were NETs. Some authors recommend studying frozen if in doubt (7). However, this is generally not possible because appendix tumors usually present as acute appendicitis (8). Therefore if there is no pathological symptom in the radiological diagnosis or during the surgery, appendectomy is sufficient, and the patients do not need additional treatment.

Colorectal cancers may be associated with appendix neuroendocrine tumors. Bucher et al. reported that 14% of appendiceal neoplasms have synchronous colon cancer (9). We performed a colonoscopy on our patients at the 6th week postoperatively, but we did not encounter any synchronous colorectal cancer in any of our patients.

Mucinous neoplasms of the appendix are rare, and an estimated 3500 cases are diagnosed each year in the United States (10). Appendix mucinous lesions (both benign and neoplastic) have a mild female predominance and are usually diagnosed in patients in their 50s and 60s (11). In our series, we encountered 5 cases of appendix low-grade mucinous neoplasia (LAMN). Our patients were compatible with the literature in terms of age and gender.

The risk of appendiceal mucinous neoplasms is higher in patients presenting with complicated appendicitis than in the general population. In a study involving 17 patients who underwent interval appendectomy for complicated appendicitis, five patients were found to have mucinous neoplasms (12). None of our patients had complicated appendicitis. Since mucinous cystic neoplasms are highly associated with colon and ovarian malignancies, the postoperative follow-up of our cases was performed using computed tomography, ultrasonography, and colonoscopy (13). However, no additional malignancy was observed during follow-up.

Although appendectomy is sufficient in cases with limited LAMN in the appendix, a right hemicolectomy can be planned if a positive surgical margin exists. Some authors advocate removing the mesoappendix with a sample so regional lymph nodes can be analyzed (14). Similarly, if a right hemicolectomy is performed for a negative resection margin, it should

follow oncological principles with high ligation of the ileocolic pedicle of origin. However, more extensive lymphadenectomy or routine right hemicolectomy, performed only to increase lymph node yield, is not required for LAMNs or high-grade appendix mucinous neoplasms (HAMNs) of the appendix (15).

Since rupture of the appendix mucinous lesion may cause peritoneal spreading of neoplastic cells, one must carefully resect the lesion during surgery (16). The appendix should be taken out of the abdomen with the help of a bag. If the lesion is ruptured but the rupture is surrounded by a wall, a right hemicolectomy may be considered if the surgeon thinks that it can provide a macroscopically clean surgical border. However, more extensive surgery aimed at clearing the widespread peritoneal mucinous spread (cytoreductive surgery) should only be performed by surgeons with extensive experience in peritoneal malignancies after the final pathology has returned. Therefore, in non-specialized centers, initial surgery (localized) for a ruptured appendix mucinous lesion should be limited to appendectomy/right hemicolectomy, careful examination of the abdominal cavity, and biopsy of any suspected peritoneal lesions.

Recognition of perioperative tumor cases is a warning for the surgeon in terms of obtaining a clean surgical margin. Withfield et al. surgeons suggested that elderly patients with symptomatic acute appendicitis for a long time should be careful if there is a mass-like image (8). In our study, approximately one-fifth of the tumor group was over the age of 50, and their symptomatology was limited to a few days. We think that imaging and surgical findings are as important as pathology results when deciding on appendiceal tumors.

CONCLUSION

Although appendiceal neoplasms are uncommon, they often present as acute appendicitis. Preoperative diagnosis is difficult in patients with appendiceal neoplasia. Therefore when a mass formation is seen during exploration, a methodical perioperative examination should be performed with the suspicion of metastatic disease. Appendectomy will be sufficient in most cases. Incorrect and hasty diagnoses can result in inappropriate surgical treatment.

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Licensing

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Ethical approval: The approval for the study was obtained from the Non-Interventional Clinical Research Ethics Committee of Van Research and Training Hospital (2020/20 – 08.10.2020).

Sažetak

MALIGNI TUMORI SLEPOG CREVA: EVALUACIJA 6748 SLUČAJEVA

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Cilj: Karcinom slepog creva se obično dijagnostikuje slučajno, nakon apendektomije kod lečenja akutne upale slepog creva. Ova studija imala je za cilj da predstavi slučajne maligne slučajeve koje smo otkrili retrospektivno ispitivanjem naših rezultata apendektomije.

Materijali i metode: Retrospektivno je analizirano 6748 slučajeva apendektomije izvedenih u bolnici Van Research and Training, Odeljenje za hirurgiju, Turska, u periodu od januara 2016. do januara 2020. godine. Nakon histopatološke analize, za 22 pacijenta je utvrđeno da imaju mucinozni karcinom niskog stepena (LAMN) i neuroendokrine tumore (NET). Kompletni podaci pacijenata su zabeleženi, uključujući i demografske, laboratorijske, imidžing, i histopatološke podatke.

Rezultati: Prosečna starost 22 pacijenta uključena u studiju bila je 39 godina (18-72 godine), a 14 (63,6%) su bile žene. Sumnjalo se na zloćudnost kod samo 4 (18%) pacijenta tokom eksplorativne laparo-

tomije. Histološki, tumor je lociran distalno kod 19 (83,4%) pacijenata i bio je lociran pri bazi slepog creva kod 3 pacijenta. Histopatološkom analizom je dokazan gradus 1 NET kod 15 pacijenata, LAMN kod 5 pacijenata, gradus 2 NET kod 1 pacijenta i mešoviti tip (mucinozni + neuroendokrini tumor) kod 1 pacijenta. Srednje vreme praćenja bilo je 45,5 meseci (raspon: 26-53). Tokom praćenja, jednom od naših pacijenata koji je podvrgnut desnoj hemikolektomiji zbog tumora na hirurškoj ivici dijagnostikovao je pseudomiksom peritoneuma.

Zaključak: Karcinom slepog creva se najčešće dijagnostikuje u toku postoperativnih patoloških pregleda preparata. Kod pacijenata kod kojih se sumnja na malignost tokom perioperativnog ispitivanja, od ključne je važnosti pažljivo pregledati intraabdominalne organe i izbeći pozitivnu hiruršku marginu. Rizik od maligniteta uvek treba imati na umu pri nerutinim pregledima slepog creva.

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THE IMPACT OF A RAPID SEQUENCE INTUBATION ON ARTERIAL BLOOD GASES DURING THE PREOXYGENATION PHASE PERFORMED IN A HOSPITAL EMERGENCY DEPARTMENT

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Abstract: Aim: During rapid sequence intubation (RSI), the O₂ reserve limits the intubation duration. The study objective was to examine the impact of RSI on arterial blood gases (ABG) during the preoxygenation phase.

Methods: This open, prospective clinical study examined samples of patients who had endotracheal intubation (ETI) as RSI between March 2014 and September 2014 in our emergency department. The variations in ABG PaO₂ and PaCO₂ before and after preoxygenation and after intubation were examined and compared with demographic and clinical variables.

Results: The study included 67 patients (46 male, 21 female) with a mean age of 69.9 years. SBP, DBP, and MABP decreased, while pulse rate and SpO₂ increased. No difference was observed between PaO₂ values and demographic and clinical variables; however, a statistically significant relationship was found between the difference (Δ) between PaO₂ values measured after endotracheal tracheal intubation (ETI) and after preoxygenation and the ABG SpO₂ and the SpO₂ classification before preoxygenation.

Conclusion: The relationship between SpO₂ and its classification following ETI and increased ABG SpO₂ was statistically significant. Our real-life study emphasises that deciding on intubation without desaturating patients could have positive effects on intubation success. Regardless, increasing SpO₂ prior to ETI will contribute positively to the O₂ reserve by the end of ETI.

The Δ PaO₂, before and after preoxygenation, was not affected by age; gender; body mass index (BMI) and its classification; GCSS; vital signs and ABG find-

ings gathered before preoxygenation; respiration rate (RR) during preoxygenation; preoxygenation duration; oral air passage usage or air leakage.

Keywords: Rapid sequence intubation, preoxygenation, emergency ward.

INTRODUCTION

Rapid sequence intubation (RSI) is the standard airway management practice in the emergency department (ED) because it provides rapid sedation and paralysis. Clinical treatment requires quick recognition of respiratory failure since a decision for endotracheal intubation (ETI) may be difficult for emergency physicians, and the ETI must be performed fast when indicated.

Preoxygenation generates a potential O₂ reserve by allowing an exchange of nitrogen and oxygen in the alveolar area during a few minutes of apnea (1). When an ETI is considered, preoxygenation must be started in the shortest possible timeframe. In RSI, all patients, including those without manifest hypoxia, are preoxygenated. Preoxygenation provides a security buffer between hypoventilation and apnea and prolongs the safe apnea duration (the period required to maintain peripheral capillary oxygen saturation (SpO₂) between 88–90% until a permanent airway is ensured). If preoxygenation is not performed, the SpO₂ drops to very critical levels (< 70%) within minutes (1, 2, 3).

Although the ideal preoxygenation duration is debatable, the general advice is to deliver 100% O₂ at 15 L/min for 3–5 minutes with a non-backflow respiration mask. Consequently, 8 minutes is provided for desatu-

ration. This period is shortened for critical patients and patients with advanced metabolic disturbances (1, 2, 3).

There are different ways to perform preoxygenation. In patients with spontaneous respiration O_2 support can be provided with an oral mask or nasal catheter and then requesting the patients to inspire deeply (4). In patients with insufficient respiration and variable consciousness levels, preoxygenation can be applied with a non-backflow respiration balloon mask. Another recently welcomed preoxygenation method is the use of non-invasive mechanical ventilation. Some publications indicate a higher success rate using non-invasive mechanical ventilation with elective hypoxia cases (5, 6).

In this study, the effects of the preoxygenation phase parameters (such as breath count and preoxygenation duration) on arterial blood gas (ABG) were examined in ED patients who underwent RSI. The primary efficacy endpoint was an increase in the ABG partial oxygen pressure (PaO_2). The secondary efficacy endpoint was a decrease in the ABG partial carbon dioxide pressure ($PaCO_2$).

MATERIAL AND METHODS

This study was an open, prospective clinical study conducted on patients who underwent ETI in the adult ED between March 1st, 2014, and September 30th, 2014 in Istanbul Education Research Hospital. Approval was granted by the hospital ethics committee (21.02.2014/433) and the research budget committee (28.01.2014/852).

During the study, ETI was performed on 273 patients; 144 (52.7%) underwent RSI. Of the latter, 77 patients (53.5%) were excluded for the following reasons: cardiac arrest during ETI (49 patients, 34%), age < 18 years (5 patients, 3.5%), ABG measurement error (missing data, measurement failure, inappropriate sample) (13 patients, 9%), consent not given by the family (10 patients, 7%). In total, 67 patients (46 men and 21 women) were included in the final analysis.

Preoxygenation was performed on patients in a supine position. The patients were provided with 100% O_2 support with a balloon mask with a reservoir by a one-handed C-E technique according to the 2010 American Heart Association Resuscitation Guideline. The goal was to provide 8–10 breaths/minute as per 1 breath in 6–8 seconds and to support spontaneous respiration. The patients were monitored for SpO_2 during breath giving. The ABG measurement was used to assess the sufficiency of O_2 provision sufficiency. For ABG measurement 2 ml of arterial blood was obtained from the radial or femoral artery while respecting the asepsis–antisepsis rules at the end of preoxygenation and just before drug administration, without delaying

the ETI. The blood was drawn into heparinized injector syringes (BD Preset & BD A-Line, Becton, Dickinson and Company, Belliver Industrial Estate, Plymouth, UK) and analyzed in an ABG device (RAPID Lab 1200 Systems, Siemens Healthcare Diagnostics Inc., New York, USA).

Descriptive analyses were conducted for all data and study parameters (SP) listed below. The differences between ABG PaO_2 (ΔPaO_2) and ABG $PaCO_2$ ($\Delta PaCO_2$), both before and after preoxygenation, were calculated. The second ΔPaO_2 (i.e. the ΔPaO_2 between the end of preoxygenation [second measurement] and following the ETI [third measurement]) and the similarly measured second $\Delta PaCO_2$ between the end of preoxygenation and after ETI were then calculated.

The correlations were investigated between the following SP and the ΔPaO_2 and $\Delta PaCO_2$; and the second ΔPaO_2 and second $\Delta PaCO_2$:

- Age
- Gender
- BMI and its classification
- GCSS
- Parameters before preoxygenation:
 - Mean Arterial Blood Pressure (MABP)
 - SpO_2 and its classification
 - ABG SpO_2
 - Respiration rate (RR)
- Preoxygenation parameters:
 - Provided breath count
 - Preoxygenation duration
 - Airway usage
 - Air escape

SPSS 15.0 for Windows was used for statistical analysis. In descriptive statistics, we used numbers and percentages for categorical variables, whereas using the mean, standard deviation, and minimum and maximum values for numerical variables. When a normal distribution could not be met, comparisons of two independent groups were performed using the Mann Whitney U test. The Kruskal Wallis test was applied for comparisons of multiple groups. Chi-square analysis was used to test the independent proportionalities of categorical variables between groups. A bivariate normal model for correlation detection was used as correlation $pH0 = 0$, alpha error probability 0.05, and correlation $pH1 = 0.3$. The statistical significance threshold was $p < 0.05$.

RESULTS

The patients' demographic and clinical characteristics are shown in Table 1. The vital signs before and after preoxygenation, according to the Joint National Committee (JNC)-8, classification are shown in Table 2.

Table 1. Second ΔPaO_2 and its relationship with SP-2

ΔPaO_2 , 3 rd - 2 nd measurement			
		Mean $\pm$ SD	p
Gender	Male	159.3 $\pm$ 124.7	0.111
	Female	99.0 $\pm$ 76.4	
Airway usage	Yes	127.9 $\pm$ 102.5	0.671
	No	148.3 $\pm$ 122.4	
Air Escape	No	148.7 $\pm$ 118.5	0.250
	Yes	98.3 $\pm$ 85.6	
BMI classification	Normal	153.5 $\pm$ 127.4	0.855
	Slightly overweight	128.4 $\pm$ 99.7	
	Obese	134.2 $\pm$ 117.9	
SpO₂ classification before preoxygenation	< 90	98.6 $\pm$ 95.4	0.008
	90 and > 90	174.3 $\pm$ 119.0	
Induction Agent	Midazolam	152.5 $\pm$ 123.4	0.780
	Ketamine	104.7 $\pm$ 80.1	
	Thiopental	127.1 $\pm$ 97.5	
	Propofol	64.8 $\pm$ 45.0	
	Etomidate	95.1	
Paralyzing Agent	Vecuronium	143.5 $\pm$ 118.2	0.845
	Rocuronium	129.7 $\pm$ 104.7	

Table 2. The relationship of second ΔPaO_2 with SP

		Rho/Value	Mean $\pm$ SD	P
Age		0.232		0.059
Gender	Male		159.3 $\pm$ 124.7	0.111
	Female		99.0 $\pm$ 76.4	
GCSS		0.074		0.550
BMI		-0.111		0.372
BMI Classification	Normal		153.5 $\pm$ 127.4	0.855
	Slightly overweight		128.4 $\pm$ 99.7	
	Obese		134.2 $\pm$ 117.9	
MABP		0.193		0.117
SpO₂		0.319		0.009
SpO₂ classification	< 90		98.6 $\pm$ 95.4	0.008
	$\geq$ 90		174.3 $\pm$ 119.0	
ABG SpO₂		0.266		0.030
Provided breath count		-0.028		0.825
Preoxygenation duration (sec)		-0.156		0.208
Airway Usage	Yes		127.9 $\pm$ 102.5	0.671
	No		148.3 $\pm$ 122.4	
Air Escape	Absent		148.7 $\pm$ 118.5	0.250
	Present		98.3 $\pm$ 85.6	
ETI duration		0,186		0.132
Induction Agent	Midazolam		152.5 $\pm$ 123.4	0.780
	Ketamine		104.7 $\pm$ 80.1	
	Thiopental		127.1 $\pm$ 97.5	
Paralyzing Agent	Vecuronium		143.5 $\pm$ 118.2	0.845
	Rocuronium		129.7 $\pm$ 104.7	

A) Before preoxygenation:

Mean PaO₂ = 80.2% ± 49.8 (range 26.8–257.1%)

Mean PaCO₂ = 51.8% ± 26.8 (12.8–122.9%).

The second ΔPaO₂ and its relationship with the general parameters are shown in Table 2,

B) Following the ETI:

Mean PaO₂ = 253.8% ± 135.6 (33.3–532.2%)

Mean PaCO₂ = 46.1% ± 20.7 (17.9–115.7%).

C) Mean ΔPaO₂ = 33.3 ± 59.8 (-43.4–336.8)

Mean ΔPaCO₂ = -1.2 ± 9.7 (-27.8–17)

D) Mean second ΔPaO₂ = 140.4 ± 1147 (-8.4–396.5)

Mean second ΔPaCO₂ = -4.0 ± 19.7 (-55–91).

No statistically significant difference was noted between the effects of different SP on ΔPaO₂ ($p > 0.05$).

The ΔPaO₂ between the end of preoxygenation (second measurement) and that following ETI (third measurement) (i.e. the second ΔPaO₂) were compared with the SP in Table 2.

The relationships of the second ΔPaO₂ with the SpO₂ and SpO₂ classification before preoxygenation and preoxygenation SpO₂ were statistically significant ($p < 0.05$). A statistically significant positive correlation was found between the SpO₂ before preoxygenation and the second ΔPaO₂ ($p = 0.009$). No other correlations were detected between the second ΔPaO₂ and the other SP. No statistically significant difference was noted between the other groups (Table 2 and Table 1 below).

Table 2 shows a statistically significantly higher mean of the second ΔPaO₂ for patients with SpO₂ ≥ 90 than SpO₂ < 90.

DISCUSSION

RSI studies typically involve induction and comparison of paralyzing techniques, RSI indications, and contraindications (2,7). No study has yet assessed the preoxygenation efficiency in RSI. Our study calculated the authentic ΔPaO₂ values before and after preoxygenation in RSI, the relationship between these changes and the patients' demographic characteristics, vital signs, and preoxygenation parameters.

Chroniere et al. (8) found that voluntary hyperventilation before RSI did not cause a decrease in PaCO₂ after ETI. This supports our findings of no statistically significant relationship between preoxygenation parameters in RSI (i.e. the preoxygenation duration, breath count provided, ETI period, and ΔPaCO₂ before and after preoxygenation).

In our study, the most important factors regarding O₂ level in patients who underwent RSI were their SpO₂ prior to RSI and their SpO₂ category. Nearly all the previous studies have shown that O₂ support given prior to an ETI had to be continued during the ETI. This indicates that a higher O₂ level prior to an ETI

will lead to a lower and insignificant SpO₂ decrease at the end of the ETI. Several factors influence the efficiency of O₂ support given prior to an ETI. However, in our study, the efficiency of O₂ support given prior to an ETI was directly correlated with the O₂ amount provided before the ETI.

Therefore, the decision for intubation without desaturating patients could have positive effects on the intubation procedure. No matter how increased SpO₂ is obtained prior to an ETI, the increase will contribute positively to the O₂ reserve until the end of the ETI. The ΔPaO₂ before and after preoxygenation was not influenced by the SP. The relationships between SpO₂ and its classification, following the ETI and the increase in SpO₂, were found to be statistically significant.

A study by Davis et al. investigated the impact of hypoxia and hyperventilation on the outcome after RSI performed by paramedics on severely head-injured patients and pointed to the critical importance of correct RSI application for reduction in the mortality rate of these patients (4). Hyperventilation and severe hypoxia during paramedic RSI were associated with an increase in mortality.

Several previous studies (9, 10, 11) support our findings of a positive effect of oxygenation on the peri-intubation SpO₂ increase and better patient outcomes:

1. With no preoxygenation, the starting SpO₂ dropped from 98% to 90% in 52 seconds with apnea. At the other extreme, following full preoxygenation with 100% O₂ for 3 minutes or more, SpO₂ remained at 100% for 7.75 minutes during apnea and dropped to 90% after another 75 seconds. Hyperventilation did not result in more rapid normalization of SpO₂, irrespective of the ventilation level (9).

2. Eighty-one patients (20%) were extubated and discharged from the ICU in 48 h or less; these patients had higher pre-RSI SpO₂ values (10).

3. A recent meta-analysis (11) conducted in 2017 showed that apneic oxygenation was associated with decreased hypoxemia, first-pass intubation success, and increased lowest peri-intubation SpO₂.

In conclusion, our study is a real-life experience emphasizing how a timely decision for intubation could have positive effects on intubation success without desaturating patients and could improve patient clinical outcomes. No matter how the increase of SpO₂ is achieved before the ETI, it will contribute positively to the O₂ reserve until the end of the ETI.

Abbreviations

ES — Emergency Service

EI — Endotracheal Intubation

ET — Endo tracheal tube

LMA — Laryngeal Mask Airway

COPD — Chronic obstructive pulmonary disease

RSI — Rapid sequential intubation

IV — Intravenous

ARDS — Adult respiratory distress syndrome

SAO₂ — Oxygen saturation

ETCO₂ — End tidal CO₂

İEAH — Istanbul Education and Research Hospital

ABG — Arterial Blood Gases

GKS — Glasgow Coma Scale

BMI — Body Mass Index

SBP — Systolic Blood Pressure

DBP — Diastolic Blood Pressure

MAP — Mean Arterial Pressure

PAO₂ — Partial Oxygen Pressure

PACO₂ — Partial Carbondioxide Pressure

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Sažetak

UTICAJ BRZE INTUBACIJE NA ARTERIJSKE KRVNE GASOVE TOKOM FAZE PREOKSIGENACIJE IZVRŠENE NA BOLNIČKOM ODELJENJU URGENTNE MEDICINE

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Cilj: Tokom brze intubacije (RSI), rezerva O₂ ograničava trajanje intubacije. Cilj studije bio je ispitati uticaj RSI na gasove arterijske krvi (ABG) tokom faze preoksigenacije.

Metode: Ova otvorena, prospektivna klinička studija ispitala je uzorke pacijenata koji su imali endotrahealnu intubaciju (ETI) kao RSI u periodu od marta 2014. do septembra 2014. godine u našoj hitnoj službi. Varijacije u ABG PaO₂ i PaCO₂ pre i posle preoksigenacije i nakon intubacije su ispitane i upoređene sa demografskim i kliničkim varijablama.

Rezultati: Studija je obuhvatila 67 pacijenata (46 muškaraca, 21 žena) sa prosečnom starošću od 69,9 godina. SBP, DBP i MABP su se smanjili, dok su se puls i SpO₂ povećali. Nije primećena razlika između vrednosti PaO₂ i demografskih i kliničkih varijabli; međutim, pronađena je statistički značajna veza između razlike (D) između vrednosti PaO₂ izmerenih na-

kon endotrahealne trahealne intubacije (ETI) i nakon preoksigenacije i ABG SpO₂ i klasifikacije SpO₂ pre preoksigenacije.

Zaključak: Odnos između SpO₂ i njegove klasifikacije nakon ETI i povećanog ABG SpO₂ bio je statistički značajan. Naša studija iz stvarnog života naglašava da bi odlučivanje o intubaciji bez desaturacije pacijenata moglo imati pozitivne efekte na uspeh intubacije. Bez obzira na to, povećanje SpO₂ pre ETI -a pozitivno će doprineti rezervi O₂ do kraja ETI -a. Starost nije uticala na DPao₂, pre i posle preoksigenacije; pol; indeks telesne mase (BMI) i njegovu klasifikaciju; GCSS; vitalni znaci i nalazi ABG prikupljeni pre preoksigenacije; stopa disanja (RR) tokom preoksigenacije; trajanje preoksigenacije; upotreba vazdušnog prolaza ili curenje vazduha.

Cljučne reči: Brza intubacija sekvenci, preoksigenacija, hitno odeljenje.

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INVESTIGATION OF HEALTH INSURANCE COSTS OF THE PATIENTS WITH MILD COVID-19 SYMPTOMS IN EMERGENCY ROOM

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Abstract: Introduction: This study aims to understand the burden of invoice costs of outpatients with mild Covid-19 symptoms on Social Security Institution (SSI); also, how it may have influenced the current economic situation.

Material and Method: This research is a cross-sectional, retrospective, and descriptive study. The study universe includes the cases who applied to the emergency room (ER) with the symptoms of Covid-19. The sample group was the patients who applied to the Sakarya Training and Research Hospital (SEAH) pandemic ER between 01/09/2020 and 30/06/2021.

Results: During the study period, 130,975 patients were admitted to the pandemic ER. The mean emergency service bill of the cases was \$10.6 (± 9), and the lowest was \$2.2; the highest was \$201.7. There was a weak but significant positive correlation between the patients' age and invoice amount (spearman= 0.051, $p=0.001$). It was perceived that the emergency service bills of the inpatients (mean=21.9 \$) were more than twice that of the outpatients (mean=10.3 \$).

Conclusion: In pandemic ER, mild symptomatic young patients' bills can be cheap. It was observed that emergency physicians did not apply too many tests and imaging methods in this patient group and were content only with Rt-PCR scanning. Also, ER bills can increase with age.

Keywords: Covid-19, pandemics, emergency service, costs.

INTRODUCTION

The Covid-19 disease rose in China during the last months of 2019 and spread to other countries quickly, and was declared a pandemic by the World Health Organization (WHO) in early 2020 (1). After this date, some countries have closed borders, limiting

flights, introducing social isolation rules, and curfews to decrease the spread rate (2).

A historical discount in oil prices, a reduction in industrial production, automobile and restaurant sales, and as a result, it was seen that unemployment rates reached double digits in many countries during the Covid-19 pandemic (3). Therefore many employees experienced losses in their monthly income and welfare (4). At the same time, the health sector was adversely affected by this financial contraction in some countries. The decrease in hospital admissions and the holding of elective operations caused a decrease in hospitals' revenues (5, 6).

Most people in Turkey have health insurance under the Social Security Institution (SSI); furthermore, this health insurance covers all emergency health services in public hospitals. This study will make an effort to reveal the SSI invoice amounts of the emergency services of Covid-19 suspected patients with mild symptoms. Thus, it aims to understand the burden of invoice costs of outpatients with mild Covid-19 symptoms on SSI; also, how it may have influenced the current economic situation.

MATERIAL AND METHOD

Research Type

This research is a cross-sectional, retrospective, and descriptive study. The study universe includes the cases who applied to the emergency room (ER) with the symptoms of Covid-19, and the sample group was the patients who applied to the Sakarya Training and Research Hospital (SEAH) pandemic ER between 01/09/2020 and 30/06/2021.

Definitions

Pandemic ER is a hospital unit for suspected Covid-19 patients with mild symptoms. In this unit

tests such as reverse transcription-polymerase chain reaction (Rt-PCR), hemogram, blood gas, d-Dimer, biochemical tests, X-ray, and computed tomography (CT) can be studied. In this ER, health service delivery is provided by general practitioners. Rt-PCR test, hydroxychloroquine, or favipiravir drugs are given in the ER are free of charge and are not billed to SSI. Furthermore, if the patients have social health insurance, the examination fee, all other tests (except Rt-PCR), and the treatments applied are invoiced to the SSI.

The Covid-19 signs such as; dry cough, fever, loss of taste or smell, fatigue, conjunctivitis, nasal congestion, headache, sore throat, different types of skin rash, nausea or vomiting, muscle or joint pain, chills, or dizziness, diarrhea assented to mild symptoms (7).

Since the US Dollar (\$) exchange rate varied considerably during the study period, the arithmetic average of the \$ exchange rate of this period was taken and 1 \$ = 7.85 Turkish lire.

Inclusion Criteria

- Patients aged 18 and over,
- Cases who applied to the pandemic ER and were examined,
- Patients whose data could be reached entirely through the automation system of the hospital were included in the research.

Exclusion criteria

- Cases under the age of 18,
- Patients who admitted tooth er units of the hospital except for the pandemic ER,
- Subjects who applied to the pandemic ER and left the hospital without being examined,
- Patients whose SSI invoices could not be reached were excluded from the study.

Data Collection

Patients' age, gender, Rt-PCR, hemogram, biochemical parameters, d-Dimer, ferritin, CRP, blood gas, X-Ray and computed tomography examination information, hospitalization or outpatient follow-up situation were collected retrospectively from the hospital automation system and patient files. The patients' SSI invoices were obtained from the automation system of the hospital.

Statistical Analysis

The data were analyzed with the statistic program (IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.). The values of Skewness and Kurtosis were demanded to be in the range of -2 / +

2 for the data's normal distribution (8). The independent t-test was applied to compare the values of two independent groups with normal distribution, and the Pearson Chi-Square test was utilized to compare categorical data; moreover, a p-value < 0.05 was considered statistically significant. Spearman correlation test was used for correlation analysis within data groups that did not arrange the normal distribution.

Ethics Approval and Permissions

Approval for this study was obtained from the Sakarya University Faculty of Medicine Ethics Committee [IRB numbers: 71522473/050.01.04].

RESULTS

During the study period, 130,975 patients were admitted to the pandemic ER, and the mean age was 37.6 years (SD = 14, min = 18, max = 108), and the median age was 35. Of these patients, 73,534 (56.1%) were male, and 57441 (43.9%) were female. When comparing patients' age with patients' gender, the mean age of female cases was statistically higher [$t(118837) = -16.9$, $p = 0.001$].

The number of tests requested from the patients is presented in Table 1. Accordingly, hemogram ($x_2 = 377$, SD = 1, $p = 0.001$), biochemical parameters ($x_2 = 376$, SD = 1, $p = 0.001$), d-Dimer ($x_2 = 360$, SD = 1, $p = 0.001$), ferritin ($x_2 = 364$, SD = 1, $p = 0.001$), CRP ($x_2 = 367$, SD = 1, $p = 0.001$), blood gas tests ($x_2 = 89$, SD = 1, $p = 0.001$) as number and ratio was significantly more studied between the female gender; Rt-PCR ($x_2 = 40$, SD = 1, $p = 0.001$), X-ray ($x_2 = 127$, SD = 1, $p = 0.001$) and CT ($x_2 = 56$, SD = 1, $p = 0.001$) were applied more in the male gender.

The mean age of the patients whose hemogram, biochemical parameters, d-Dimer, ferritin, CRP, blood gas, X-ray, and CT tests were studied was found to be significantly higher [respectively; $t(13575) = -87$, $p = 0.001$, $t(13504) = -88$, $p = 0.001$, $t(12080) = -87$, $p = 0.001$, $t(12087) = -87$, $p = 0.001$, $t(12973) = -87$, $p = 0.001$, $t(4041) = -46$, $p = 0.001$, $t(12727) = -28$, $p = 0.001$, $t(6810) = -79$, $p = 0.001$]. On the other hand, it was observed that the mean age of the patients who underwent Rt-PCR test was younger than the patients who did not [$t(16185) = 35$, $p = 0.001$].

The mean emergency service bill of the cases was \$10.6 (± 9), and the lowest was \$2.2; the highest was \$201.7. There was a weak but significant positive correlation between the patients' age and invoice amount (spearman = 0.051, $p = 0.001$).

The average bill for women was \$10.7, while men's was \$10.5. However, it was determined that the

Table 1. Crosstab of applied tests count and patients' gender

Test	Gender				Total		<i>p</i> -value ^a
	Male		Female				
	Yes	No	Yes	No	Yes	No	
	n (%) ^b	n (%) ^b	n (%) ^b	n (%) ^b	n (%) ^b	n (%) ^b	
Hemogram	5740 (8)	67794 (92)	6276 (11)	51165 (89)	12016 (9)	118959 (91)	0.001
Biochemical	5708 (8)	67826 (92)	6245 (11)	51196 (89)	11953 (9)	119022 (91)	0.001
d-Dimer	5127 (7)	68407 (93)	5675 (10)	51766 (90)	10802 (8)	120173 (92)	0.001
Ferritin	5128 (7)	68406 (93)	5686 (10)	51755 (90)	10814 (8)	120161 (92)	0.001
CRP	5504 (8)	68030 (93)	6036 (11)	51405 (90)	11550 (9)	119435 (92)	0.001
Rt-PCR	66227 (90)	7307 (10)	51117 (89)	6324 (11)	117334 (90)	13541 (10)	0.001
Blood Gas	1894 (3)	71640 (97)	1992 (4)	55449 (97)	3886 (3)	127089 (97)	0.001
X-ray	5625 (8)	67909 (92)	5396 (9)	52045 (91)	11021 (8)	119954 (92)	0.001
CT	3273 (5)	70261 (96)	3070 (5)	54371 (95)	6343 (5)	124632 (95)	0.001

^aPearson Chi-Square test results, ^bPercent within patients' gender.

average invoice cost of the patients in 2020 (mean = 14.7 \$) was more than three times the average invoice price in 2021 (mean = 4.6 \$). CT was utilized for 4229 (5.4%) patients in 2020; moreover, for 2114 (4%) patients in 2021. It was observed that the number and rate of CT scans decreased over the years.

In 2020, 912 (1.2%) of 77,669 patients were hospitalized, and 1029 (1.9%) of 53,306 patients were hospitalized in 2021. A significant difference was determined in the number of hospitalizations by years ($\chi^2 = 124$, $SD = 1$, $p = 0.001$). Accordingly, it was recognized that the number and rate of hospitalized patients increased. The age of the patients affected the hospitalization status, and the mean age of the hospitalized patients (mean = 57.5) was detected to be significantly higher than that of the outpatients (mean = 37.3) [$t(1995) = -61$, $p = 0.001$]. Besides, it was perceived that the emergency service bills of the inpatients (mean = 21.9 \$) were more than twice that of the outpatients (mean = 10.3 \$).

DISCUSSION

Studies in the literature on health insurance costs of patients admitted to emergency services with the suspicion of COVID-19 are very limited. In a study conducted by Edwine Barasa et al. in Kenya, it was stated that the follow-up of asymptomatic and mildly symptomatic COVID-19 patients in the hospital instead of at home increases the treatment costs up to four times (9). In the same study, it was published that the cost of the treatment increased approximately six times when patients were admitted to the general hospital wards (9). It was noticed that the mild symptomatic outpatients' invoice costs were lower than those

who were decided to be hospitalized in our study. Although patients' bills after hospitalization were out of our scope, the high invoice costs in the ER were in line with the above research results.

Carmen Guadalupe Rodriguez-Gonzalez et al. notified that the risk of ARDS rises with increasing age in Covid-19 patients receiving hospital treatment in Spain; moreover, the Covid-19 treatment was 408 Euros per patient (10). Erhan Ekingen and Ahmet Yıldız described in their study on the treatment costs of Covid-19 patients hospitalized in Turkey that the average cost per person was \$653; also, this cost was higher in patients over 65 years of age (11). For non-Covid-19 patients, Behcet Varışlı et al. informed that the bills of the patient group over the age of 85 who applied to the emergency department were more expensive than the younger cases (12).

Moran Dong et al. pointed that the average treatment cost of hospitalized Covid-19 patients was around \$2869 per patient, and the treatment costs were higher in males and the elderly in China (13). In another study conducted in China, the average cost of treatment for Covid-19 patients aged 0-34 was \$2752, and \$11668 for patients over 70 years of age (14). According to our study results, it was observed that insurance costs rise in parallel with the increasing age of the patients. In this respect, our study coincides with the results of the above study. The increase in mortality with age, the more insidious course of Covid-19 pneumonia in elderly patients, and the more frequent observation of severe disease in the elderly, and the need for further examination of elderly patients may explain the increase in the cost of bills in the emergency department with age (15-18). On the other hand, in contrast to Mo-

ran Dong et al., a slightly higher invoice cost was seen in the female gender in our study.

The fact that young patients with mild symptoms applied to the ER in the pandemic may have brought the low number of expensive examination requests such as CT. While Rt-PCR was tested in 90% of the cases, simple laboratory tests such as hemogram were only 10% of all patients, and the CT rate was 5% might have caused the low pandemic emergency bills of young mildly symptomatic patients.

CONCLUSION

In pandemic ER, mild symptomatic young patients' bills can be cheap. It was observed that emergency physicians did not apply too many tests and imaging methods in this patient group and were content only with Rt-PCR scanning. Also, ER bills can increase with age.

Sažetak

ISTRAŽIVANJE TROŠKOVA ZDRAVSTVENOG OSIGURANJA PACIJENTA SA BLAGIM SIMPTOMIMA KOVID-19 U HITNOJ SLUŽBI

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Uvod: Cilj ove studije je da shvati teret fakturnih troškova ambulantnih pacijenata sa blagim simptomima Kovid-19 u Zavodu za socijalno osiguranje (SSI); takođe, kako je to moglo uticati na trenutnu ekonomsku situaciju.

Materijal i metode: Ovo istraživanje je studija preseka, retrospektiva i deskriptivna studija. Studija uključuje slučajeve koji su primljeni u Službu hitne pomoći (ER) sa simptomima Kovid-19. Ispitivanu grupu čine pacijenti koji su se javili u Sakaria Bolnicu za Obuku i Istraživanje (Sakarya Training and Research Hospital (SEAH)) u periodu od 1. 9. 2020. do 30. 6. 2021.

Rezultati: Tokom perioda istraživanja, 130.975 pacijenata je primljeno u pandemijsku Službu hitne pomoći. Prosečan račun Hitne službe u ovim slučajevima iznosio je 10,6 USD ($\pm$ 9), a najniži 2,2 USD;

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najveći je iznosio 201,7 dolara. Postojala je slaba, ali značajna pozitivna korelacija između starosti pacijenata i iznosa fakture (Sperman = 0,051, $p = 0,001$). Uočeno je da su računi za hitnu pomoć stacionarnih pacijenata (srednja vrednost = 21,9 USD) više nego dvostruko veći od troškova ambulantnih pacijenata (srednja vrednost = 10,3 USD).

Zaključak: U pandemijskoj Hitnoj pomoći, računi mlađih pacijenata sa blagim simptomima mogu biti jeftini. Uočeno je da lekari Hitne pomoći nisu primenili previše testova i metoda snimanja u ovoj grupi pacijenata i bili su zadovoljni samo Rt-PCR skeniranjem. Računi Hitne pomoći mogu da se povećavaju sa godinama.

Cljučne reči: Kovid-19, pandemija, Hitna pomoć, troškovi.

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DIGITAL DEVICE OVERUSE DURING THE COVID-19 PANDEMIC AND VISUAL IMPAIRMENT AMONG CHILDREN: IS THERE A RISK FOR LONG-TERM EFFECTS?

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Abstract: Global school closures and home quarantine caused by the COVID-19 pandemic increases digital screen time and the overall time spent on near work while decreasing outdoor time especially among school-going children, which can cause serious factors associated with asthenopia, refractive errors, low visual acuity, and accommodative insufficiency. Professionals believe that ophthalmologists now have an opportunity to draw attention to the problem, raise awareness among parents, children, and teachers, and eventually influence policymakers to develop strategies that will help children and students as well as parents and relevant institutions to deal with this issue even beyond the pandemic. Prompt implementation of adequate public and school policies and eye care services globally, effective planning of public health measures for prevention and treatment of myopia must be part of the crucial measures in the future. The consequences of widespread acceptance of digital devices in all spheres of public life by affecting visual function also affect learning, school performance, development of children, and thus their future.

Keywords: Covid-19, children, digital device overuse, visual impairment.

INTRODUCTION

We live in an era of digitalization and it is indisputable that digital technology is changing the world. Effects of digital device overuse on children's eyes and vision have become a significant subject of scientific research in the 21st century. During the COVID-19 pandemic, instituted lockdown measures which also included school closure has increased digital screen time. The COVID-19 pandemic opened a new chapter in this field of research which can be very useful in

evaluating whether and how excessive digital device usage affects the vision in children. There are more and more studies investigating digital device use in the time of COVID-19 and its correlation with visual impairment (1-4). Also, many schools around the world have implemented digital devices and digital learning in their classrooms and this is only the phase of more radical usage of digitalization in the educational system. Therefore, it is also important to evaluate the results of current studies on the use of digital devices during the COVID-19 pandemic that can be of crucial importance for future vision and eye health in children and their development and learning. Professionals believe that ophthalmologists now have an opportunity to draw attention to the problem, raise awareness among parents, children, and teachers, and eventually influence policymakers to develop strategies that will help children and students as well as parents and relevant institutions to deal with this issue also beyond the pandemic.

Visual implications of digital screen time, near work, and outdoor time before and during the COVID era

Global school closures and in-house quarantine caused by the COVID-19 pandemic increases digital screen time and the overall time spent on near work while decreasing outdoor time especially among school-going children, which can cause serious factors associated with asthenopia, refractive errors, low visual acuity, and accommodative insufficiency.

Even before the COVID-19 pandemic, factors such as digital screen time, near work, and outdoor time and their impact on eye health have been the subject of many ophthalmology studies and professional

meetings, specifically because of the ongoing myopia epidemic. Systematic research and meta-analysis performed by the Holden BA et al. and published in 2016, showed that the prevalence of myopia will increase from 30% now to 50% by 2050, which means that around 5 billion people will be myopic by then and among them 1 billion with high myopia (5). Uncorrected refractive error was the second most common cause of blindness and the first most common cause of moderate to severe vision impairment globally in 2010 (6). Economic consequences are grave. It is estimated that the global cost of lost productivity due to uncorrected myopia was USD 244 billion and USD 6 billion due to myopic macular degeneration in 2015 (7). More important is the fact that high myopia is a risk factor for pathologic ocular changes such as retinal detachment, cataracts, glaucoma, myopic macular degeneration, all of which can cause irreversible vision loss (8).

It is a fact that ophthalmologists are facing an increased number of children complaining about symptoms associated with Computer Vision Syndrome (CVS) like eyestrain, headache, dry eyes, itching, and blurred vision due to excessive use of digital devices. There were only a few studies about the impact of digital device use on children's vision before the COVID-19 pandemic, but more and more new studies are investigating this issue since the pandemic began. Previous studies estimated that children can experience digital eyestrain (DES) that occurs in most cases because the visual demands of the task exceed the visual abilities of the individual to comfortably perform the task (9). A two-year follow-up study in China, which investigated the effects of E-learning environment use on visual function among 721 elementary and middle school students, determined that E-learning environment use time significantly affects visual acuity among students. The longer use of the E-learning environment significantly correlated with decreasing in horary visual acuity among students. The horary visual acuity changes were more significant in lower-grade students. The study implicated that some other causes of vision loss, in addition to the E-learning environment use after class, may be increased use of other digital devices and lack of exercise (10). Few studies showed that smartphone use is significantly associated with dry eye disease (DED) in children (11). Also, studies showed that the prevalence of DED is significantly higher among children in urban areas, as well as the rate of smartphone use (12). DESK study-1 in India, which investigated the prevalence of DES among schoolchildren before and during the COVID-19 pandemic, showed an increased prevalence of DES among children (50.23%) during this pandemic due to the increased duration of online

classes and increased digital screen time compared to some previous studies (13, 14). In this study, the significant risk factors for DES were the age of a child, digital screen time > 5h, and playing videogames on a smartphone for >1h per day, which, as authors suggest, is because of more hours of smartphone use and longer duration of online classes among older children during COVID-19 pandemic (13).

Eyesight, especially myopia, is still the most important issue related to digital screen time, near work, and outdoor activities. Related studies during the COVID-19 pandemic will be quite useful in investigating whether these factors are significant in a serious increase in the number of people with myopia. It is now well known that myopia is a serious public health and socio-economic problem, and high myopia is a risk factor for ocular complications that can lead to severe vision impairment and blindness. There is no doubt that getting a myopia diagnosis on time in children and preventing the progression to pathological high myopia is of crucial importance. Many studies performed before the COVID-19 pandemic highlighted that near work and outdoor time are important factors that can influence the onset and progression of myopia among children. However, more important is that these environmental factors are modifiable (15). Pärssinen O et al. in a 22-year-follow-up study, found that decreased outdoor time and increased near-work time in childhood are associated with adulthood high myopia (16). Some countries in East and Southeast Asia, where the epidemic of myopia is strongly connected with environmental factors, have implemented national myopia prevention program in schools that aims for more hours per day outdoors. Most of the studies based on the assessment of the efficacy of implementation of additional outdoor activities in schools were performed in those countries, which have been identified as "hot spots" when it comes to the myopia epidemic.

It is documented that higher levels of daily light exposure time reduce the myopia change in both non-myopic and myopic children, correlate with less axial eye growth, and can be used to slow down the onset of myopia, especially in younger children (17-25).

The association of near work and myopia is found to be more significant in children than in the older population, but more specific, longitudinal, and randomized controlled trials are needed to establish more consistent conclusions among experts. It is the same with digital screen time. A systematic review studies and meta-analysis indicates a link between near work and onset and progression of myopia. They also show that, when it comes to near work, the time that children spend reading is a significant factor for myopia in children, not the time they spend studying, using a com-

puter, or watching TV. Also, the intensity more than the duration of near work is an important risk factor for myopia (26, 27). There is a growing number of studies that investigate the correlation between digital screen time, asthenopia, and eyesight. A previously mentioned study concluded that digital screen time >5h and playing videogames on a smartphone for > 1h per day are significant risk factors for DES among schoolchildren in India (13). A strong correlation between digital screen time and myopia was estimated in more studies among schoolchildren. Studies in India estimated that the risk of myopia was 8 times higher among children with more than 2 hours/day of mobile and video game screen time compared to children with 0-2 hours/day and 8 times higher in children with > 4hr/week of screen time compared to those with no screen time (28,29). In Ireland, a relevant study determined that the incidence of myopia is significantly higher among school children, with more than 3h/day of smartphone screen time compared to those who used smartphones less than 1 hour per day (30). Among the other digital devices, smartphone overuse is significantly positively associated with the incidence of visual impairment and digital eyestrain, and children are the most vulnerable group of the population (13, 31). Although the limitations of recent studies require further investigations, their results indicate a myogenic effect of increased digital screen time with special emphasis on younger children. Excessive use of digital devices also reduces outdoor time, which can also affect the onset and progression of myopia.

COVID-19 pandemic opened a significant need for new studies, clinical trials, and screening to better assess all direct and indirect effects of all known risk factors on ocular health and visual function. Those findings will be very helpful for future strategies and planning further public health measures for prevention and treatment of myopia and other consequent eye conditions, particularly among children, because of its potential to influence their learning, school performance, and thus their future. Anti-epidemic measures during the COVID-19 pandemic created the “ideal” conditions for all relevant risk factors that can compromise visual health in children. They led to increased indoor time, significant growth in digital screen time, excessive near work. What can the findings of current studies tell us?

Since the pandemic started in China, the first results came from their studies. In a large prospective cross-sectional study, which included 123 535 children aged 6-8 years in China, researchers aimed to investigate the prevalence and progression of myopia during the COVID-19 home confinement. The prevalence of myopia increased 1.4 to 3 times in 2020 compared with

the previous years (2015-2019), and the myopic shift was significant among younger children aged 6 (−0.32 D), 7 (−0.28 D), and 8 (−0.29 D) years (32). Preliminary results of the study among children in Argentina, 5-18 years of age, are similar. The mean annual progression of myopia was significantly higher during the period 2019-2020 than 2018-2019 and was less in older children (33). One smaller study included 115 myopic children in Alanya, aged 8-17 years, who have been followed up for at least three years before the pandemic. Myopia progression was statistically significant in 2020 compared to the previous three years and significantly less among children who spent 2h/day outdoor or lived in detached houses. Digital screen time and the type of device were not found to have a significant influence on myopia progression in this study (2). Erdinest et al. published interesting research among 14 children who have been treated with 0.01% atropine solution for myopia control for two years ((March 2019 until March 2021). During the whole second year, children were home-schooled. The average spherical equivalent refraction (SER) and axial length (AL) increased significantly during the year of the lockdowns compared to pre-lockdowns year treatment (34). The large sample size cohort study as a part of The Myopia Screening Survey of Children and Teenagers in Schools, conducted in 46 primary and junior high schools in Hangzhou, China, started in early 2019, with examinations performed 6-month intervals thereafter, show a progression of myopia among the respondents but in a partially reversible manner. Myopic progression was reversed partially half a year after the lockdown, which can be explained, as they speculate, by accommodative spasms during the lockdown, which is caused by decreased indoor time, increased digital screen time, and limited indoor space. They also found that younger participants are more susceptible to myopic progression during a lockdown, which they explain by two possible hypotheses: younger children had more restricted indoor time during the lockdown and they may be more sensitive to lifestyle changes during the lockdown (35). A study in Spain investigated the impact of in-house quarantine during the COVID-19 pandemic on the vision of school-aged children. This cross-sectional study analyzed the results obtained during the “scholar campaign in favor of the visual health” carried out in 2019 and 2020 among the children aged 5-7 years. They came to similar conclusions (36).

CONCLUSION

It is a fact that the COVID-19 pandemic and the intensity of measures taken to suppress the spread of the pandemic caused drastic lifestyle changes that led

to decreased outdoor time, increased digital screen time, especially among children. More than 1 billion children are affected by school closures due to the pandemic globally. No matter how long and to what extent online learning will continue, behavioral changes and dependence on digital devices may persist even after the COVID-19 pandemic. Facing the problem of the myopia epidemic worldwide and its consequences, eye health professionals invest a lot of effort in studies and research that will help to prevent myopia and reduce its progression. According to that, the COVID-19 pandemic is a reason for great concern. A very important conclusion of previous studies is that younger children are significantly sensitive to factors such as increased indoor, digital device time and increased near work compared to teenagers and adolescents, and they show significantly higher myopic shift and prevalence of DES when it comes to these risk factors. The sooner myopia develops, the greater is the risk for developing more serious eye conditions later in life, like retinal detachment, macular degeneration, and glaucoma. Therefore, it is of great importance to raise awareness among schools, children, parents, and

relevant institutions and to work on productive collaboration among them. Prompt implementation of adequate public and school policies and eye care services globally, effective planning of public health measures for prevention and treatment of myopia must be part of the crucial measures in the future. The consequences of widespread acceptance of digital devices in all spheres of public life by affecting visual function also affect learning, school performance, and development of children, and thus their future.

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Sažetak

PREKOMERNA UPOTREBA DIGITALNIH UREĐAJA TOKOM COVID-19 PANDEMIJE I POREMEĆAJI VIDA KOD DECE: POSTOJI LI RIZIK ZA DUGOROČNE EFEKTE?

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Globalno zatvaranje škola i kućni karantin zbog pandemije COVID-19 povećavaju vreme korišćenja digitalnih uređaja kao i ukupno vreme rada na blizinu, a smanjuju vreme boravka na otvorenom, posebno među školskom decom, što može uticati na pojavu astenopije, refraktivnih grešaka, smanjenja vidne oštine i insuficijencije akomodacije. Stručnjaci veruju da oftalmolozi sada imaju posebnu priliku da apeluju na ovaj problem, da podignu svest o tome među roditeljima, decom i prosvetnim radnicima, pa i da utiču na nadležne organe u smislu razvijanja strategija koje će pomoći deci i studentima, kao i roditeljima i rele-

vantnim institucijama da se nose s ovim problemom i nakon pandemije. Brza implementacija odgovarajućih javnih i školskih programa i usluga za očuvanje zdravlja oka na globalnom nivou, kao i efektivna implementacija mera za prevenciju i lečenje miopije, moraju biti deo ključnijih mera za očuvanje javnog zdravlja u budućnosti. Posledice široko rasprostranjene upotrebe digitalnih uređaja u svim sferama javnog života utičući na vidne funkcije utiču takođe i na učenje, uspeh u školi i razvoj dece, a time i na njihovu budućnost.

Ključne reči: Covid-19, deca, prekomerna upotreba digitalnih uređaja, poremećaji vida.

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IN THE MEMORY OF KATARINA MILOVUK AND SERBIAN CHARITY

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Abstract: Katarina Milovuk (Ekaterina Đorđević) was born on August 28, 1844 in Novi Sad of Serbia. She proved to be one of the first women to realize her professional potentials “outside the home hearth” in Serbia, and even more authentically as a true Serbian “Heroine of the Spirit” of the targeted fight for women’s rights. With her valuable presentation and views, Katarina Milovuk attracted about 3000 ladies from the most prominent Belgrade families, who accepted the task of taking part in the medical training for girls and women to help Serbian soldiers on the battlefield, and who were more decimated by the typhus epidemic than by lethal bullets of enemies. The main opus (her aim) of her social engagement was the historical struggle for women’s rights and activities in the education of women’s youth in Serbia. As an active participant in social life in Serbia, she participated in the historical organization of aid for the Serbian army during the wars that Serbia was waging at the time.

Keywords: Katarina Milovuk; Serbian charity and Serbian patriotism; heroine for women’s rights; Serbian army.

INTRODUCTION

Katarina Milovuk (Ekaterina Đorđević) was born on August 28, 1844 in Novi Sad of Serbia, from parents Jovan and Jelisaveta Đorđević. Her father was a brave soldier and an Austrian lieutenant, and at the age of 18, he fled to Belgrade. As a military officer, he proved himself in the fights against the Turks, in the battle of Sokol, and the battle on the Drina. After the bombing of Belgrade in 1862, he became the commander of the defense of the city of Belgrade. He sent his daughter to high school in the then prestigious educational institution, the Nikolaev Gymnasium at the University of Odesa, where Katarina passed the



Figure 1. Katarina Milovuk (1863–1913) the real heroine character for women’s rights

Photo: Archive of the National Bank of Serbia/
Belgrade library (1863–1913)

state pedagogy qualifying exam in 1861. After finishing school successfully, Katarina returned to Belgrade. She was a polyglot and could speak Russian, French, German, and English. She also played the piano (1).

She was perceived as a fair, educated, and strict woman, which was a rarity in the traditional Serbian capital between anarchy and autocracy (2).

She proved to be one of the first women to realize her professional potentials “outside the home hearth” in Serbia, and even more authentically as a true Serbian “Heroine of the Spirit” of the targeted fight for women’s rights (3). A famous, charitable character, who successfully rose above her time and existence in Serbia, was always great and the first towards all priority tasks (3), shown in Figure 1.

EDUCATIONAL AND PEDAGOGICAL CAREER

At the age of 19, Katarina Milovuk took over the function of the manager of the newly opened “Higher

Women's School", and on the recommendation of the Head of the Ministry of Education of Serbia, Ljubomir Nenadović, she then started her educational and pedagogical career through the women's movement in Serbia (4), shown in Figure 2.



Figure 2. The first class of graduates of "Higher Women's School" 1865/66

Photo: Archive of the National Bank of Serbia/
Belgrade library: "Higher Women's School":
1863-1913

The "Higher Women's School" raised groups of educated women in Serbia. It educated 25000 female teachers and created four women's high schools: "Women's Teacher's School" (1900), "The First Women's Real High School" (1905), "The Second" (1918), "The Third" at Savamala (5).

She fought for the importance of pro-European and feminist ideas in Serbia with all her strength and skills, so that in 1875 she participated in the founding of the "Belgrade Women's Society", which she successfully managed from 1889 to 1891 (6).

Katarina Milovuk dedicated her professional life to the "Belgrade Women's Society", which is a unique, bright example of a true heroine of Serbian patriotism and charity (7).

In 1865, she got married to Milan Milovuk, a school director of Belgrade "Realka", a lawyer, a professor of history, the founder and first choirmaster of the then Belgrade Singing Society. Since she could not realize herself as a mother, she directed all her inexhaustible life energy towards pedagogical, cultural, educational, traditional, and humanitarian work (8).

She participated in the publication of the national magazine "The Housewife", the first women's magazine in Serbia since 1879. She was an active organizer of volunteer humanitarian work and numerous cultural activities of the society "without borders" (9). The goal of the society was to provide girls with higher general education and to provide educated Serbian teachers for women's primary schools, which began to open and work (by Law, 1847) (10). The society's curriculum included eleven free subjects: the science

of Christianity, the Serbian language, general and Serbian history, and geography, natural sciences, arithmetic, pedagogy, dietetics, writing, women's work, gymnastics, domestic technology - cooking skills. Three elective subjects: piano, painting, and foreign language were compulsory and free. Only poor students received books and snacks at that time (10, 11).

She gained the love and respect of her people. She enjoyed the honor of the Serbian rulers because the words and deeds of young Katarina were appreciated and influential in all strata of Serbian society. For three decades, she was entrusted with the upbringing of girls aged 11-19, at the end of the 19th century, in then "Semi-Oriental Serbia" in which the "Women's question" was raised (12).

HISTORICAL STRUGGLE FOR WOMEN'S RIGHTS

She was the co-founder and vice president of the "Circle of Serbian Sisters" together with Delfa Ivanić, Nadežda Petrović, Draga Ljočić, and other Serbian benefactress (1903) (13).

With her valuable presentation and views, Katarina Milovuk attracted about 3000 ladies from the most prominent Belgrade - families, who accepted the task of conducting medical training for girls and women to help Serbian soldiers on the battlefield, and who were more decimated by the typhus epidemic than by the lethal bullets of enemies (14).

She dedicated most of her energy to the fight for national interests, rights, and emancipation of women in the 19th century in Serbia. She initiated the founding of the "Serbian People's Women's Union" which fought for women's suffrage and was its first president (1906). She rose from the first women, who revolted against the "shackles" of patriarchal Serbian society, fighting for women's rights and status. She was an advocate for women. She fought for voting rights, education, the right to work and earn a salary. She founded the "Women's Worker's School" with "Pazar" where the works of schoolgirls were sold, intending to enable women aged 13 to 17 to earn and be independent (15).

Her students were Draga Mašin – a historical great female figure, Nadežda Petrović – a famous painter, Draga Ljočić – a first woman doctor of medicine, Mage Magazinović – a journalist, Zorka Todosić – an actress, and other successful women who followed her path. She was greatly supported by Queen Natalija and other ladies in the government, who attended her lessons, side by side with her students, in the cradle of education in Serbia (16).

She influenced the formation of the correct and realistic attitudes of famous women in Serbia, who

then faced social prejudices, mistrust, and challenge. She went down in history as a person responsible for the evolution of the female intellectual elite in Serbia. She was the first woman in Serbia who demanded to be registered and active on the voter list in 1897. In 1900, she submitted a request to the President and the Senate that all independent women and women who supported their families be granted the right to vote. Her appeal for women's suffrage was rejected, but her discipline, spirituality, and vision were not diminished - that she "*set the car on the right path*" both during the political upheavals and during the wars and tragedies in Serbia. Her demands also affected the constitutional order of Serbia (16).

She was also an active member of the humanitarian "*Society for Support and Education of the Poor and Abandoned Children*" (17).

With her colleagues from school, she founded the "*Women's Music Society*" whose performances and recitals were long remembered among the most prominent citizens of Belgrade at that time (18), shown in Figure 3.



Figure 3. "*Women's Music Society*" in Belgrade, 1894

Photo: Belgrade City Museum: "*The Management of the Belgrade Women's Association*", 1894

HUMANITARIAN WORK: SERBIAN CHARITY AND SERBIAN PATRIOTISM

Her indomitable spirit as an "*army of mercy*" knew no defeat. During the Serbian wars at the time, fighting for liberation and unification, Katarina Milovuk was actively involved in other humanitarian work. Amid the Serbian-Turkish Wars (1876-1878) and the Serbian-Bulgarian War (1885), she trained women as diligent nurses. During the Balkan Wars, she renovated the "*Saint Jelena*" shelter, which took care of the children of soldiers on the fronts, and paved the way for the medical culture of Balkan-nations (19).

Through her efforts, a sewing workshop was opened within the building of the "*Higher Women's School*" in Belgrade, where clothes were sewn for the needs of the Serbian army, and other important activities, which the "*Army of mercy*" gave to Serbian-war-history (20, 21).

The Serbian sisters left memorial signs through the history of Serbian wars and the signs of the authentic history of Serbian literature [22]. After thirty years, she retired (1893) but did not stop with her other activities. She dedicated herself to translation work and translated from German the novel "*Down with Weapons*" by baroness *Bertha von Suttner* (Belgrade, 1899), who won the Nobel Peace Prize in 1905 (22).

She was the author of textbooks used in teaching pedagogy and methodology: *Pedagogy - Textbook for Girls of the Higher School of Women* (Belgrade, 1866), *Methodology - textbook for students of the Higher School of Women* (Belgrade, 1866), *History of the World in a Short Review for Women* (Belgrade, 1871) (23). Just before her doomsday, Katarina Milovuk was one of the successful speakers at the "*Congress of the International Alliance for Women's Voting Rights*" in Budapest. She was awarded for her humanitarian work "*The order of the Serbian Red Cross*", in 1877, "*The medal of Princess Natalija for zealous service*", in 1878, "*The medal of Queen Natalia*" in 1886, "*The order of Saint Sava*" in 1905 and two Russian decorations for mercy, humaneness, and charity. The world will still have to reckon with the patriotism of Serbian women - a war epilogue (23).

Katarina Milovuk (among acquaintances called "*Milovukica*") died in Belgrade, on September 27, 1913, at the age of 69. In remembrance, Katarina Milovuk and Serbian patriotism not to be forgotten, a street in Belgrade, in the municipality of Zvezdara, bears her name (24).

With this historical text, the authors want to remind of the "*Heroine of the Spirit*" ahead of her time and gender (the founder of the feminist movement) in the struggle for cultural revival and emancipation of women for the right to work and educate, and for others to meet Katrina Milovuk: the most influential, most educated woman in Serbia in the second half of the nineteenth century (24).

In memory of remembrance and gratitude, to pay tribute and preserve from eternal oblivion "*Heroine of the Serbian spirit - When women became citizens in Serbia*", and their culture of femininity, existence, and power in society (24, 25)!

IN CONCLUSION

The main opus (the aim) of her social engagement was the historical struggle for women's rights and ac-

tivities related to the education of young women and girls in Serbia. As an active participant in the social life in Serbia, she also participated in the historical organization of aid for the Serbian army during the wars that Serbia was waging.

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Sažetak

SEĆANJE NA KATARINU MILOVUK I SRPSKO DOBROČINSTVO

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Katarina Milovuk (Ekaterina Đorđević) rođena je 28. avgusta 1844. u Novom Sadu u Srbiji. Dokazala se kao jedna je od prvih žena, koja je u Srbiji ostvarila svoje profesionalne potencijale „izvan kućnog ognjišta“, a još autentičnije kao prava srpska „Heroina duha“ ciljane borbe za ženska prava. Svojim vrednim izlaganjem i stavovima Katarina Milovuk je privukla oko 3000 dama iz najuglednijih beogradskih porodica, koje su prihvatile zadatak da održe medicinske obuke za devojkice i žene, kako bi pomogle srpskim vojnicima

na ratištu, a koji su bili više desetkovali od epidemije tifusa, nego od neprijateljskih ubojnih metaka. Glavni opus (cilj) društvenog angažovanja Katarine Milovuk bila je istorijska borba za prava žena i aktivnosti u obrazovanju ženske omladine u Srbiji. Kao aktivni sudionik društvenog života u Srbiji, i u vreme ratova koje je Srbija tada vodila, učestvovala je i u istorijskom organizovanju pomoći za srpsku vojsku.

Cljučne reči: Katarina Milovuk; srpsko dobročinstvo i patriotizam; heroína za ženska prava; srpska vojska.

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DELICATE NEEDLE WITH THE FINEST GAUGE FOR A BUTTERFLY GLAND, THE THYROID: IS IT WORTH MENTIONING?

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Thyroidology has yet to declare the optimal needle size for thyroid fine-needle aspiration (FNA) cytology. In this respect, the researches on this issue remain restricted in English-language literature. Currently, Saraph and colleagues (1) evaluated dissimilarity between 23- and 25-gauge needles in terms of nondiagnostic/unsatisfactory rates of The Bethesda System for Reporting Thyroid Cytopathology (TBSRTC) after FNA applications. The authors had worked with a sum of 141 23- and 157 25-gauge needles and reported their nondiagnostic/unsatisfactory rates as 31.09% and 35.07%, respectively, with no statistical difference. However, Dong et al. (2) reported working with 240 consecutive nodules, had undergone US-guided FNA (US-FNA), and obtained the highest scores of sample quality with 25-gauge needles in thyroid FNA cytology, comparing with 22- and 23-gauge needles, very recently. The authors declared the nondiagnostic scores of 15.42%, 19.58%, and 14.17% for US-FNA with 22-, 23-, and 25-gauge needles, respectively (2). In addition, recently, Shumrick et al. (3) reported 148 thyroid nodules in 107 cases, had undergone US-FNA, revealing significantly less non-diagnostic cytology with 27-gauged needles, 11.3%, comparing 25-gauge needles, 24.7%. We recently have studied the possible impact of size cutoff of 10- and 15-mm for the thyroid nodules on three diagnostic tools; *i*) strain elastography (SE), *ii*) sonography-guided FNA cytology, and *iii*) histopathology. A sum of 425 cases with 500 thyroid nodules had undergone US-guided FNA (US-FNA) with 27-gauge *finest-needle* by a single surgeon (I.S.), surgeon-performed US (SUS), with a local anesthetic agent (1-3 mL of 1% lidocaine with 1:100,000 epinephrine) based on American Thyroid Association (ATA) management guidelines for patients with thy-

roid nodules and differentiated thyroid cancer [i.e. low, intermediate, and high suspicion nodules]; 2015 ATA management guidelines for adult patients with thyroid nodules and differentiated thyroid cancer] for three years and two months. TBSRTC 1st ed. had been used for this period, for the mentioned considerable and novel ‘SUS based’ US-FNA terminology with the specific and also ‘well-accepted and crucial’ size cut offs of 10- and 15- mm in Thyroidology revealing the FNA cytology outcomes with 27-gauge fine needles, for Category I, per se, TBSRTC, 1st ed. were revealed as 9.0% (4). Moss et al. (5) notified that regular and coordinated thyroid FNA should be performed with smaller needle gauges, 24-27-gauges, without aspiration, routinely, in a systematic review and meta-analysis. Saraph et al. (1) specified the utilization of a 25-gauge needle did not produce a lower nondiagnostic rate, comparing the 23-gauge one. In addition, they pointed out that larger nodules might increase diagnostic rates, while the older and cystic nodules are prone to inadequate samples. We agree with Saraph and colleagues’ (1) opinion about the limitations of nodule location, such as a posterior, more difficult to reach nodules, and sonography of composition (mixed and solid) and echogenicity which may be crucial parameters for this issue. Nonetheless, we postulate that the so-called needle gauge concept selectively enriches with finer needles. Additionally, we currently introduced the proposal of a novel terminology, “minimally invasive FNA (MIFNA)” and “minimally invasive thyroid FNA; Thyroid MIFNA (Thy MIFNA)”, including 27-gauge fine-needle with pre-procedural topical and local anesthetic agents administration, hope to contribute in Thyroidology (6). Of note, we might recommend *opting for a 27-gauge*

finest needle in terms of US-FNA for a butterfly gland, the thyroid, with reasonable low rates of non-diagnostic/unsatisfactory cytology, TBSRTC, 1st and 2nd ed. and low severity of pain, as a matter of course. To this end, we also recommend: “*think twice with larger needles for thyroid US-FNA*”. This issue merits further investigation.

Keywords: Thyroid gland, Needle, Gauge, Optimal size, Fine-needle aspiration, Thyroidology.

Abbreviations

FNA — Fine-needle aspiration

US — Ultrasonography

SE — Strain elastography

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ATA — American Thyroid Association

TBSRTC — The Bethesda System for Reporting Thyroid Cytopathology.

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None.

Conflict of Interests: The authors declare that there are no conflicts of interest related to this article.

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RETRACTION NOTE

**RETRACTED ARTICLE:
ATRIAL FIBRILATION AND GAMA GLUTAMYL TRANSFERASE;
OF-PUMP VERSUS ON-PUMP CORONARY ARTERY BYPASS SURGERY**

Khalil Emced

SANAMED. 2020; 15(2): 101–5. doi: 10.24125/sanamed.v15i2.440

Due to the suspicion that there has been a violation of ethical principles relating to a multiple submissions at the same time, this paper is retracted.

RETRACTION NOTE

**RETRACTED ARTICLE:
COMPARATIVE STUDY ON THE EVALUATION
OF TEMPOROMANDIBULAR JOINT AND NECK STRUCTURES
IN HEALTHY VOLUNTEERS AND IDIOPATHIC SCOLIOSIS PATIENTS**

Benli Merve, Gokcen-Rohlig Bilge, Akgül Turgut, Evlioglu Gulumser

Sanamed. 2018; 13(3): 221–7. doi: 10.24125/sanamed.v13i3.255

The editorial board of Sanamed journal was informed by the corresponding author of this article that the data in the conducted study were not correct and were not obtained appropriately, which leads to the fact that the results of this study have the risk of bias and are not true. According to this ethical problems, authors retracted the article.

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3. **Poglavlje ili članak u knjizi:**

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