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Self-esteem and quality of life in healthcare workers of Covid hospital

Samopoštovanje i kvaliteta života zdravstvenih djelatnika covid bolnice

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Summary

Introduction: During the Coronavirus Disease 19 pandemic (COVID-19), healthcare workers of a COVID hospital are constantly in an environment that predisposes stress and burnout. In such an environment, low self-esteem can be a huge problem. The work environment in which health workers find themselves during a pandemic contributes significantly to a reduced quality of life. We wanted to explore the level and relationship of self-esteem and quality of life in healthcare workers working in a COVID-19 hospital at the peak of the pandemic.

Methods: A cross-sectional study was designed. The study was conducted at a COVID-19 hospital in Bosnia and Herzegovina. The survey was conducted between December 2020 and May 2021, at the peak of the third wave. Data from 116 correctly and fully completed questionnaires were analyzed. The following questionnaires were used: the Socio-Demographic Questionnaire personally designed, the World Health Organization Quality of Life-BREF, the Rosenberg Self-Esteem Scale.

Results: There was a statistically significant positive correlation between the self-esteem level and domains of quality of life ($p < 0.001$). The results of the regression analyses indicated that the psychological well-being domain significantly predicted the self-esteem level ($p < 0.001$). It was found that self-esteem significantly predicted the psychological domain at a strongest level ($p < 0.001$). The physical health domain was significantly negatively affected by the socio-demographic variable "Gender" ($p < 0.05$), and positively by the "Preparation" variable ($p < 0.05$).

Conclusion: There was a statistically significant positive correlation between the self-esteem level and QOL among healthcare workers working at a COVID hospital. The self-esteem level significantly predicted all four quality of life domains.

Key words: self-esteem, quality of life, healthcare workers, COVID-19, hospital

Sažetak

Uvod: Tijekom COVID-19 pandemije, zdravstveni djelatnici COVID bolnice neprestano su u okruženju koje uzrokuje stres i sagorijevanje. Takvo okruženje značajno doprinosi smanjenju kvalitete života. U ovoj studiji istraživali smo razinu i povezanost samopoštovanja i kvalitete života zdravstvenih djelatnika COVID bolnice u jeku pandemije.

Metode: Provedena je presječna studija. Mjesto studije predstavlja COVID bolnica Sveučilišne kliničke bolnice Mostar. Prikupljanje podataka provedeno je u vremenskom razdoblju između prosinca 2020. i svibnja 2021. godine, na vrhuncu trećeg vala pandemije. Analizirao je 116 pravilno ispunjenih upitnika. Korišteni su sljedeći mjerni instrumenti: socio-demografski upitnik namjenski sačinjen za ovo istraživanje, WHOQOL-BREF – skraćena verzija upitnika kvalitete života Svjetske zdravstvene organizacije, te Rosenbergova skala samopoštovanja (RSES – Rosenberg Self-Esteem Scale).

Rezultati: Pronađena je statistički značajna pozitivna povezanost između razine samopoštovanja i domena kvalitete života ($p < 0,001$). Rezultati regresijske analize pokazuju da domena „Psihološka dobrobit" statistički

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značajno predviđa razinu samopoštovanja ($p < 0,001$). Pronađeno je da samopoštovanje u najvećoj mjeri utječe na domenu „Psihološka dobrobit“ ($p < 0,001$). Domena „Tjelesno zdravlje je pod negativnim utjecajem od varijable „Spol“ ($p < 0,05$), te pod pozitivnim utjecajem od varijable „Pripremljenost“ ($p < 0,05$).

Zaključak: Postoji statistički značajna povezanost između samopoštovanja i kvalitete života zdravstvenih djelatnika COVID bolnice. Razina samopoštovanja statistički značajno predviđa sve četiri domene kvalitete života.

Ključne riječi: samopoštovanje, kvaliteta života, zdravstveni djelatnici, COVID-19, bolnica

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Introduction

During the Coronavirus Disease 19 (COVID-19) pandemic, healthcare workers of a COVID hospital are constantly in an environment that predisposes to stress and burnout. Johnson and co-workers state that in such an environment, low self-esteem can be a huge problem.[1] The emergence of COVID-19 was a challenge for health systems and their staff around the world, and especially for low-income countries.[2] Chinese and Singaporean studies that contained a small sample indicate negative mental reactions of healthcare workers to the emergence of a pandemic and work in new conditions.[3-6] Some authors show that healthcare workers suffered from great stress and psychological distress during the epidemic of infectious diseases.[6,7] Young and co-workers stated that nearly half of the health workers surveyed showed serious psychiatric symptoms during the COVID-19 pandemic. The work environment in which health workers found themselves during a pandemic contributed significantly to the severity of psychiatric symptoms and the reduced quality of life (QOL).[8] People with low self-esteem report more negative emotions and show less activity and even an attitude of avoiding difficulties, challenges and risks.[9] Accordingly, some scientists believe that the people most affected by the outbreak of the COVID-19 pandemic are those who have low self-esteem.[10] Factors such as job insecurity, long periods of isolation and an uncertain future affect the pronounced psychological symptoms and reduced QOL of healthcare workers during the COVID-19 pandemic.[11] Zheng states that identifying psychological problems as well as reduced psychological well-being among frontline healthcare workers as a very important domain of QOL is the first step in relation to effective interventions.[12] Medical workers working in stressful departments makes them more susceptible to psychological symptoms, leading to decreased QOL and self-esteem.[13]

Most of the research in the area of self-esteem and QOL among healthcare workers has been carried out among nurses in developed Western and Asian countries. There is a paucity of data from Southeast Europe and developing countries, as well as data from other cadre of healthcare workers. The trend of increasing emigration of healthcare workers from Bosnia and Herzegovina contributes to the reduction of health personnel, which is a crucial problem, especially at a time of pandemic when even larger countries face a lack of healthcare workers. Accordingly, it is extremely important to monitor the psychological health of healthcare professionals who are in direct contact with COVID-19 patients, in order to avoid further loss of healthcare staff. Therefore, we wanted to explore the level and relationship of self-esteem and QOL of healthcare professionals working at a COVID hospital. An additional goal was to investigate the socio-demographic factors influencing these two variables.

Methods

In order to achieve the objectives of the paper, a cross-sectional quantitative study was designed. The study was conducted at the COVID Hospital of Mostar University Clinical Hospital (UCH) in Bosnia and Herzegovina. The survey was conducted between December 2020 and May 2021.

Healthcare workers over the age of 18 years working at COVID hospital Mostar UCH were included in this study. Excluded from the study were healthcare workers with a history or a family history of mental illness, who had serious health problems, death of a family member, divorce or separation, or participation in a legal dispute. We came to these data by examining the respondents during the distribution of the questionnaire. In this way, six respondents were excluded (all due to the death of a close family member).

Healthcare workers who did not work at the time of the study were also excluded from the study. Five respondents were excluded through this exclusion criteria. Furthermore, incomplete questionnaires were excluded from the study. The sample size was determined using the G*power, version 3.1.9.4 software program (Heinrich Heine University, Dusseldorf, Germany). The minimum required sample size was 109. In the formula for calculating the sample size in multiple regression analysis, the significance

level was 0.05, the medium effect size was 0.15, the power of the study was 80.0% with eight predictors. In order to increase the strength of the study and the expected sample dropout of 20%, the authors decided to include 130 respondents in the study. Data from 116 correctly and fully completed questionnaires completed by healthcare workers who voluntarily agreed to participate in the study were analyzed.

We received permission to conduct the study from the head of the COVID hospital and the Mostar Clinical Hospital Ethics Committee. All procedures in the research were performed according to the regulations of the latest revision of the Declaration of Helsinki. The aim, risks and welfare of the study were represented to each respondent. All participants provided informed consent.

Data collection

For the purpose of data collection, the following questionnaires were used, which were validated and approved by the authors:

The Socio-Demographic Questionnaire personally designed and made for this research, was used to obtain data on respondents such as: gender, education, marriage status, monthly income, drinking alcohol, occupation, preparation for work with patients with COVID-19.

The World Health Organization Quality of Life-BREF (WHOQOL-BREF) questionnaire was used to assess the quality of life. Psychometric studies have shown that this questionnaire is a reliable and standardized instrument and correlates highly with the World Health Organization Quality of Life-100, around 0.89. Due to the smaller number of questions and faster resolution, it is given preference over the full version. The questionnaire consists of four domains: physical health (domain 1; 7 items), psychological well-being (domain 2; 6 items), social relations (domain 3; 3 items) and environment (domain 4; 8 items). The first two questions of the questionnaire are related to the overall quality of life. Question 1 asks about an individual's overall perception of the quality of life. Question 2 asks about an individual's overall perception of their health. A higher score (maximum 10) represents a higher overall quality of life. The four domain scores denote an individual's perception of the quality of life in each particular domain. Domain scores are scaled in a positive direction (i.e. higher scores denote a higher quality of life). It consists of 26 particles, and each question is scored on a five-point Likert scale.[14] According to the guidelines, the raw domain scores for the WHOQOL-BREF were transformed to a score between 0 and 100.[15] The reliability Cronbach alpha coefficient for this questionnaire in this study was 0.80 for domain 1, 0.84 for domain 2, 0.82 for domain 3, 0.75 for domain 4 and 0.70 for the overall quality of life.

The Rosenberg Self-Esteem Scale (RSES*)* was used for evaluating individual self-esteem among health care workers. In this questionnaire, the scale is one-dimensional. The respondent answers all the questions on a Likert scale from 1 to 5. The lowest answer indicates a strong disagreement with the statement made, while the highest answer refers to a strong agreement.[16] The reliability Cronbach alpha coefficient for this scale in this research was 0.89.

Statistical analysis

The Statistical Package for the Social Sciences (SPSS) Statistics for Windows, Version 26.0, was used. The normality of data distribution was determined using the Shapiro-Wilk Test. Descriptive statistics methods were used for data analysis. Continuous numerical variables are expressed by arithmetic mean, standard deviation (SD), median and interquartile range with confidence interval of 95%. Categorical variables were expressed in numbers and percentages. Student's t-test was used to compare the mean scale scores of two independent groups. One-way Analysis of Variance (ANOVA) was used to compare three or more groups. The Tukey HSD (Honestly Significant Difference) test was used after a significant *F* ratio was found via an analysis of variance test. Pearson correlation was used to investigate the correlation of the domains of QOL and self-esteem. Standard multiple regression analysis was used to investigate the dependence of self-esteem on QOL domains. The level of statistical significance for all listed tests was $p < 0.05$.

Results

In this study, 130 questionnaires were distributed in total, and 124 were returned. The number of valid questionnaires retrieved was 116 (response rate = 93.5%). The average age of the respondents was 31.5 (± 8.0) years. The minimum age of the participants was 20, while the maximum age of the participants was 59. Of the total number of the participants, 31.9% of them were male and 68.1% were female. The largest number of participants were nurses (62.9%) with high school (45.7%) education and a monthly income of 500-799 € (60.3%), who drink alcohol only on special occasions (73.3%), and for the most part they felt ready to work in a COVID hospital (58.6%). The socio-demographic data of the participants are shown in Table 1.

Table 1 Socio-demographic data (n = 116)
Tablica 1. Socio-demografski podaci (n = 116)

Characteristics *(Karakteristike)*	n	%
Gender *(Spol)*		
Male *(Muški)*	37	31.9
Female *(Ženski)*	79	68.1
Education *(Obrazovanje)*		
High school *(Srednja škola)*	53	45.7
Bachelor's degree *(Prvostupnik/ica)*	25	21.6
Master's degree *(Magistar/ica)*	32	27.6
Doctor of Science *(Doktor/ica znanosti)*	6	5.2
Marriage status *(Bračni status)*		
Single *(Samac)*	58	50.0
Married *(U braku)*	58	50.0
Monthly income *(Mjesečni prihodi)*		
To 249 € (do 249 €)	2	1.7
From 250 to 499 € *(od 250 do 499 €)*	15	12.9
From 500 to 799 € *(od 500 do 799 €)*	70	60.3
800 € and more *(800 € i više)*	29	25.0
Drinking alcohol *(Pijenje alkohola)*		
Never *(Nikada)*	18	15.5
On special occasions *(U posebnim prigodama)*	85	73.3
Several times a week *(Nekoliko puta tjedno)*	10	8.6
Every day *(Svaki dan)*	3	2.6
Occupation *(Zanimanje)*		
Doctor *(Liječnik)*	23	19.8
Nurse (*Medicinska sestra)*	73	62.9
Support staff[a] (*Pomoćno osoblje)*	7	6.0
Others[b] *(Drugi)*	13	11.2
Preparation *(Pripremljenost)*		
Yes *(Da)*	48	41.4
No *(Ne)*	68	58.6

n – number of subjects (*broj ispitanika*); [a]Clinical assistants (*klinički asistenti*), patient services assistants (*pomoćnici za usluge pacijenta*), porters (*portiri*), ward clerk (*službenik odjela*); [b]Radiological engineers (*inženjeri radiologije*) and physiotherapists (*fizioterapeuti*

Self-esteem level

In general, participants showed a high level of self-esteem (40.44 ± 6.204), and the median was 42 with an interquartile range of 8. The minimum total score was 22, while the maximum total score was 50. The mean value of the responses on the Likert scale of the RSES questionnaire was 4.04 ± 0.620. There was a statistically significant difference between groups regarding alcohol consumption in self-esteem ($F(3.112) = 3.593$, $p = 0.016$). The participants who drank alcohol every day rated their self-esteem as the statistically significant lowest ($p = 0.018$) compared with participants who never drank alcohol, on special occasions, or several times a week. The RSES results indicated no statistically significant differences in self-esteem level regarding education, marriage status, monthly income, occupation or preparation.

Quality of life level

The mean value according to the respondents' answers to the first question of WHOQOL BREF on satisfaction with the overall quality of life was 3.98 ± 0.83. The largest number of respondents stated that their overall quality of life was good (52.6%), 25.9% considered the overall quality of their life very good. Regarding to the respondents' answers to the second WHOQOL BREF question related to health satisfaction, the mean value was 4.14 ± 0.75. Most of the respondents were satisfied with their health (46.6%). Females showed a statistically significantly higher level of overall QOL than males. Subjects who drank alcohol every day rated their overall QOL as the statistically significant lowest in comparison to the subjects who drank alcohol on special occasions ($p = 0.031$) or never ($p = 0.007$). According to the domains

of QOL, the mean value for the Physical health domain was 72.03 ± 15.692, for Psychological wellbeing was 75.25 ± 14.483, for Social relations domain was 76.72 ± 17.381, and for the Environment domain was 70.94 ± 14.353. In Table 2, it can be seen that respondents who were higher educated, married, higher monthly income, ready to work in a COVID hospital, had statistically significant higher scores related to the domains of physical health and psychological well-being. Respondents who reported consuming alcohol each day reported statistically significantly lower scores in all four domains. Doctors showed a statistically significantly lower level in the psychological well-being domain compared to other occupations (p = 0.004).

Table 2 Association of socio-demographic variables with quality of life domains (n = 116)
Tablica 2. Povezanost socio-demografskih varijabli s domenama kvalitete života (n = 116)

Characteristics *(Karakteristike)*	Domain 1[a] *(Domena 1)*	Domain 2[b] *(Domena 2)*	Domain 3[c] *(Domena 3)*	Domain 4[d] *(Domena 4)*
Gender *(Spol)*				
Male *(Muški)*	74.92 ± 17.095	72.22 ± 17.054	74.68 ± 19.610	68.35 ± 16.013
Female *(Ženski)*	70.68 ± 14.912	76.67 ± 12.985	77.68 ± 16.278	72.15 ± 13.144
p-value *(p-vrijednost)*	0.177	0.123	0.387	0.185
Education *(Obrazovanje)*				
High school *(Srednja škola)*	76.02 ± 11.508	77.58 ± 12.826	76.45 ± 14.732	72.26 ± 13.114
Bachelor's degree *(Prvostupnik/ica)*	64.88 ± 17.147	75.04 ± 10.918	76.20 ± 20.269	67.12 ± 14.604
Master's degree *(Magistar/ica)*	75.13 ± 13.995	75.09 ± 14.472	79.72 ± 14.774	73.84 ± 13.667
Doctor of Science *(Doktor/ica znanosti)*	50.17 ± 24.523	56.33 ± 27.478	65.33 ± 33.921	59.67 ± 21.686
p-value *(p-vrijednost)*	0.001***	0.007**	0.316	0.063
Marriage status *(Bračni status)*				
Single *(Samac)*	68.98 ± 16.931	75.64 ± 15.451	78.24 ± 19.069	69.86 ± 15.090
Married *(U braku)*	75.09 ± 13.828	74.86 ± 13.570	75.21 ± 15.530	72.02 ± 13.623
p-value *(p-vrijednost)*	0.036*	0.774	0.349	0.421
Monthly income *(Mjesečni prihodi)*				
To 249 € (*do 249 €)*	72.00 ± 4.243	84.50 ± 4.950	65.50 ± 13.435	72.00 ± 4.243
From 250 to 499 € (Od *250 do 499 €)*	73.93 ± 12.691	74.80 ± 14.766	73.27 ± 18.309	68.07 ± 18.964
From 500 to 799 € (od *500 do 799 €)*	73.73 ± 14.218	78.19 ± 12.163	78.41 ± 16.593	71.44 ± 13.008
800 € and more (*800 € i više*)	66.97 ± 19.908	67.76 ± 17.353	75.21 ± 19.061	71.14 ± 15.606
p-value *(p-vrijednost)*	0.257	0.008**	0.516	0.875
Drinking alcohol *(Pijenje alkohola)*				
Never *(Nikada)*	71.00 ± 13.534	76.89 ± 15.703	77.28 ± 19.646	69.33 ± 19.223
On special occasions *(U posebnim prigodama)*	73.55 ± 14.612	76.39 ± 12.624	77.75 ± 15.837	73.07 ± 12.058
Several times a week *(Nekoliko puta tjedno)*	70.70 ± 12.945	72.10 ± 11.561	79.40 ± 11.374	63.20 ± 12.831
Every day *(Svaki dan)*	39.67 ± 34.530	43.67 ± 32.332	35.33 ± 17.898	46.00 ± 20.224
p-value *(p-vrijednost)*	0.003**	0.001***	0.001***	0.002**
Occupation *(Zanimanje)*				
Doctor *(Liječnik)*	67.30 ± 20.652	65.57 ± 18.250	74.17 ± 19.669	68.48 ± 16.426
Nurse *(Medicinska sestra)*	72.51 ± 14.364	77.67 ± 12.162	77.56 ± 16.250	71.16 ± 14.253
Support staff[+] *(Pomoćno osoblje)*	78.71 ± 10.688	79.57 ± 16.071	73.29 ± 19.678	72.43 ± 18.510
Others[++] *(Drugi)*	74.15 ± 14.410	76.46 ± 12.447	78.38 ± 19.526	73.23 ± 8.408
p-value *(p-vrijednost)*	0.303	0.004**	0.792	0.781
Preparation *(Pripremljenost)*				
Yes *(Da)*	76.33 ± 13.573	79.27 ± 12.849	78.96 ± 15.107	78.96 ± 15.107
No *(Ne)*	69.00 ± 16.457	72.41 ± 14.982	75.15 ± 18.771	68.53 ± 13.445
p-value *(p-vrijednost)*	0.013*	0.011*	0.246	0.031*

n – Number of samples *(Broj ispitanika)*; [a]Physical health *(Tjelesno zdravlje)*; [b]Psychological well-being *(Psihološka dobrobit)*; [c]Social relations *(Socijalne interakcije)*; [d]Environment *(Okruženje)*; [+]Clinical assistants *(Klinički asistenti),* Patient services assistants *(Pomoćnici za usluge pacijenta),* Porters *(Portiri),* Ward clerk *(Službenik odjela)*; [++]Radiological engineers *(Inženjeri radiologije)* and Physiotherapists *(Fizioterapeuti)*; *p < 0.05; **p < 0.01; ***p < 0.001;

Association of self-esteem and quality of life

There was a statistically significant positive correlation between the self-esteem level with QOL ($p < 0.001$) (Table 3). Multiple regression analysis was used to test if the quality of life significantly predicted the participants' ratings of self-esteem (Table 3). The results of the regression indicated the five predictors explained 38.3% of the variance ($R^2 = 0.383$, $F(12.103) = 5.32$, $p < 0.001$). It was found that the Psychological well-being domain significantly predicted the self-esteem level ($\beta = 0.64$, $p < 0.001$).

Furthermore, regression analyses was used to test if the self-esteem and socio-demographic factors significantly predicted the respondents' ratings of overall QOL and its' domains (Table 4). The results of the regression analyses indicated the seven predictors explained 20.7% of the variance for physical activity ($p < 0.001$), 46.0% for psychological domain ($p < 0.001$), 18.3% for social relations ($p < 0.01$), and 19.1% for environment ($p < 0.001$). It was found that self-esteem significantly most strongly predicted the psychological well-being domain ($\beta = 0.54$, $p < 0.001$) (Table 5).

Table 3 Correlation of self-esteem with quality of life (n = 116)
Tablica 3. Korelacija između razine samopoštovanja s kvalitetom života (n = 116)

Variables *(Varijable)*	Correlation coefficient *(Koeficijent korelacije)*	p-value *(p-vrijednost)*
Domain 1 *(Domena 1)*[a]	0.299	0.001
Domain 2 *(Domena 2)*[b]	0.612	0.001
Domain 3 *(Domena 3)*[c]	0.380	0.001
Domain 4 *(Domena 4)*[d]	0.333	0.001
Overall *(Ukupna)*[e]	0.347	0.001

n – Number of samples *(Broj ispitanika)*; [a]Physical health *(Tjelesno zdravlje)*; [b]Psychological well-being *(Psihološka dobrobit)*; [c]Social relations *(Socijalni odnosi)*; [d]Environment *(Okruženje)*; [e]Overall quality of life *(Ukupna kvaliteta života)*

Table 4 Predictive contributions of the domains of quality of life and overall life satisfaction to the level of self-esteem (n =116)
Tablica 4. Prediktivni doprinos domena kvalitete života i ukupnoga zadovoljstva životom razini samopoštovanja (n = 116)

Predictors *(Prediktori)*	B	SE	B	t	P
Domain 1[a] *(Domena 1)*[a]	-0.001	0.037	-0.003	-0.036	0.971
Domain 2[b] *(Domena 2)*[b]	0.276	0.049	0.645	5.624	0.001*
Domain 3[c] *(Domena 3)*[c]	-0.011	0.037	-0.032	-0.303	0.762
Domain 4[d] *(Domena 4)*[d]	-0.014	0.045	-0.032	-0.312	0.756
Overall[e] *(Ukupna)*[e]	0.066	0.429	0.015	0.153	0.879

n – Number of samples *(Broj ispitanika)*; $R^2 = 0.383$; $\Delta R^2 = 0.318$; *$p < 0.001$; B – Unstandardized beta *(Nestandardizirana beta)*; SE – Standardized error *(Standardizirana greška)*; β – Standardized coefficient beta *(Nestandardizirani beta koeficijent)*; t – Student's t-test *(Studentov t-test)*; [a]Physical health *(Tjelesno zdravlje)*; [b]*Psychological well-being (Psihološka dobrobit);* [c]Social relations *(Socijalne interakcije)*; [d]Environmnent *(Okruženje)*; [e]Overall quality of life *(Ukupna kvaliteta života)*

Table 5 Predictive contribution of socio-demographic variables and self-esteem to the quality of life (n = 116)
Tablica 5. Prediktivni doprinos socio-demografskih varijabli i samopoštovanja kvaliteti života (n = 116)

Predictors *(Prediktori)*	Domain 1[a] *(Domena 1)*[a]	Domain 2[b] *(Domena 2)*[b]	Domain 3[c] *(Domena 3)*[c]	Domain 4[d] *(Domena 4)*[d]
Self-esteem (*Samopoštovanje)*	0.253**	0.546***	0.359***	0.282**
Gender *(Spol)*	-0.197*	0.037	0.020	0.076
Education *(Obrazovanje)*	-0.095	-0.046	0.020	-0.037
Monthly income *(Mjesečni prihod)*	-0.034	-0.067	0.118	0.189
Drinking alcohol *(Pijenje alkohola)*	-0.158	-0.159*	-0.154	-0.147
Occupation *(Zanimanje)*	0.077	-0.110	0.067	0.150
Preparation *(Pripremljenost)*	0.185*	0.141	0.063	0.169
R^2	0.207***	0.460***	0.183**	0.191***

n – Number of samples *(Broj ispitanika)*; *$p < 0.05$; **$p < 0.01$; [a]Physical health *(Tjelesno zdravlje)*; [b]Psychological well-being *(Psihološka dobrobit)*; [c]Social relations *(Socijalni odnosi)*; [d]Environment *(Okruženje)*

Discussion

To date, numerous studies have been conducted to determine the relationship between self-esteem and the quality of life in different populations.[17-19] In our study, the average level of self-esteem among the examined group was high compared to other healthcare workers from other countries. The results of a study conducted by Roslan, Yusoff, Asrenee and Morgan showed that Malaysian healthcare workers showed a low level of self-esteem, which is contrary to our results.[20] The reason for this difference in results may be in the greater number of participants in their research and in the greater number of doctors who participated in their research. In our study, doctors had the lowest level of self-esteem, as was the case in the study by Roslan et al.

The results of our study showed that there is a statistically significant positive correlation between the Psychological well-being domain and self-esteem. These results coincide with a research conducted by Dolan and Sanchez from 2020.[10] Their results show that individuals with higher level of self-esteem were in an excellent state of psychological well-being. Accordingly, Feng and co-workers state that self-esteem has a protective role in relation to psychological health and well-being.[21] Interestingly, Panzeri, Rossi, Ferrario and Cerutti state that those healthcare workers who worked at a COVID-19 hospital had a higher level of self-esteem compared to those working in a less stressful environment.[22] In contrast to their study, in our study, only those subjects who worked at a COVID-19 hospital were examined.

Our results showed that the overall QOL and life satisfaction among the largest number of participants was good to very good in regard to the standard determined by WHO.[15] Kumar, Bhat, and Ryali stated that the overall quality of life among healthcare workers was average.[23] The reasons for similar results between our study and the study conducted by Kumar et al may be in the similarity of the sample with respect to the occupations involved, age, and marital status. However, their sample consisted only of doctors and nurses, while other medical occupations were included in our sample. Nevertheless, this difference did not affect the difference in the overall level of quality of life between the two populations.

We found a study that reported low QOL among healthcare workers during the COVID-19 pandemic in Vietnam and that different factors affected the quality of life levels in healthcare workers, such as age, occupation, monthly income, experience.[24] In contrast to the above study, age and monthly income in our study did not have a significant association with the quality of life levels. The variable of drinking alcohol significantly affected a lower level of quality of life. This factor was not examined in the study mentioned above.

In contrast to our results, some authors reported low QOL among Indian healthcare workers during the COVID-19 pandemic.[25] Furthermore, they emphasized the importance of monitoring and treating the mental health of health professionals during the pandemic. The results of some studies showed that healthcare workers showed the lowest level in the Environmental domain of quality of life.[26] Their results matched ours in terms of quality of life between WHOQOL BREF domains. Yang et al results showed that demographic characteristics of Chinese caregivers explained most of the total variance of all QOL domains.[27] Our results also showed that individual demographic characteristics of participants such as education, monthly income, drinking alcohol, occupation and preparation significantly predict the level of QOL domains. The studies to date have largely coincided with the above result. The differences relate mainly to the marital status variable, in which no significant association was found with the quality of life domains in our study. Accordingly, Iqbal and Abasam stated that statistically significant differences in marital status, education level, income, and years of practice were found in various domains of WHOQOL-BREF.[28] Some authors stated that the lowest level of quality of life was recorded in respondents with a lower level of education and low monthly income.[29] Also, some authors stated that the quality of life level of health professionals depends on the type of occupation and that nurses have a lower quality of life.[30] In our results, no significant difference was found between the respondents in relation to the type of occupation. Moreover, in our study, nurses reported the highest level of quality of life. The reasons for such results may be in the levels of workload of health systems. Also, the mentioned study was conducted in Italy at the height of the pandemic, so it is logical that the nurses in this study were still more burdened.

A study conducted by Çelmeçe and Menekay showed that QOL level of healthcare workers who were female and married was higher compared to other groups.[31] Their results matched our results. Ranjan, Gupta, Gujar, and Baraik stated that 4.3% physical, 16.6% psychological, 65.4% social, and 21.7% environmental health had a poor level of QOL in healthcare workers.[32] The results of a study conducted by Korkmaz, Kazgan, Çekiç, Tartar, Balcı, and Atmaca showed that COVID-19 pandemic physically and mentally affected healthcare workers, and such problems could affect a poorer quality of life.[32] Their results showed that nurses had lower WHOQOL

BREF scores compared to doctors. Contrary to their results, our results showed that physicians had lower scores on all four domains of WHOQOL BREF compared to nurses and other occupations. The reasons for this result may be in the level of responsibility that the doctor had in the institution where the research was conducted and in general. Although all members of the medical team have a purposeful role in the treatment of the patient, it is the doctor who prescribes the treatment and bears the main responsibility in relation to the final outcome of the patient's treatment. The COVID-19 pandemic has been going on for a long time, but it is still insufficiently researched and causes doubts in terms of treatment, which certainly contributes to an increase in stress levels and psychological symptoms among doctors, which certainly affects the reduction in the quality of life.

In line with our results, many studies have pointed to the negative impact of the COVID-19 pandemic on the mental health of health professionals.[33-35] The world's most developed countries are increasingly introducing programs and interventions to improve the quality of life and psychological well-being of health professionals during the COVID-19 pandemic. Accordingly, China has introduced online and telephone consultations with no time limit for all health professionals who recall the need for advice or support in overcoming negative psychological burdens.[36] In France, some university hospitals developed specific programs for psychological support of healthcare workers during the pandemic.[37] Blake, Bermingham, Johnson, and Tabner stated that in the United Kingdom a team developed a digital learning and support package on psychological well-being.[38] Viswanathan, Myers, and Fanous stated that such interventions and programs are necessary for health professionals to successfully fight the pandemic and that this fight would not leave long-term consequences in all areas of the quality of life.[39] Searching the literature, we did not find information regarding the introduction of interventions in health care institutions with the aim of improving the quality of life and psychological well-being of healthcare workers in Bosnia and Herzegovina during pandemic COVID-19.

When interpreting the results of this study, it is necessary to take into account certain limitations of the study. First, some participants filled out the questionnaire immediately on the spot, so it is possible that some answers of these participants were not entirely honest. Second, the design of the study was cross-sectional. In order to monitor changes and the impact of test time on self-esteem and QOL, a longitudinal design study should be conducted. Third, a comparison of respondents by gender was made. It is important to note that more than half of the respondents were female. Also, only three respondents stated that they drank alcohol every day. Furthermore, the study was conducted in only one region, the southwestern part of Bosnia and Herzegovina. Future studies should include all the regions of Bosnia and Herzegovina with a larger number of respondents. Despite these limitations, the results of this study are extremely valuable given the topic and its relevance, and were obtained by complying with the rules of good science. One of the advantages of the study was the high response rate of respondents to participate in the study. Given that no research on this topic has been conducted in Bosnia and Herzegovina to date, the results obtained are valuable evidence, primarily for a better understanding of the impact of the pandemic on self-esteem and QOL of healthcare workers.

Conclusion

In this study, healthcare workers showed a high level of self-esteem and a moderate to high level of QOL. There was a statistically significant positive correlation between the self-esteem level and QOL among healthcare workers working at COVID-19 hospital. The strongest correlation was between the Psychological well-being domain and self-esteem. The Psychological well-being domain significantly predicted the self-esteem level. The self-esteem level significantly predicted all four domains of QOL. In order to achieve and maintain a high level of self-esteem and quality of life of healthcare workers, interventions should be designed to strengthen the psychological health of healthcare workers during the COVID-19 pandemic.

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