

Analysis of Association Between Health Care Workers' Perceived Stress and Burnout Levels During COVID-19 Pandemic in Neurosurgery Clinic

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ABSTRACT

Objective: COVID-19 disease has recently affected the whole world and caused drastic changes in people's lives with its emergence. Hospitals and healthcare personnel are among the most affected sides. Our study aimed to demonstrate the effects of the pandemic on healthcare workers regarding changes in their perceived stress and burnout levels.

Methods: 110 individuals, including physicians, nurses, and auxiliary personnel working in a neurosurgery clinic, were involved in the study. Demographic information form, Perceived Stress Scale-14 (PSS), and Maslach Burnout Index (MBI) were used during the data collection phase.

Results: No difference was found between PSS and MBI scales between females and males. Higher MBI points were seen in workers who desire to change their occupations. Married participants had higher MBI personal accomplishment scores than single participants. An increase in education level was associated with higher PSS scores. Participants who found their payments unsatisfactory had higher stress and burnout levels.

Conclusion: Findings of higher occupational burnout among physicians and nurses than auxiliary personnel have been consistent with previous research. A similar case is also present for lower perceived stress levels among married participants when compared to singles. This finding, which has also been demonstrated in other studies, can be explained by fewer responsibilities for singles.

INTRODUCTION

Starting in January 2019 in China and rapidly spreading to the world, COVID-19 has brought many problems and changes to attention and caused many changes in areas including economy, politics, health, and education. It causes people to experience both physical and mental problems. The latest and largest epidemic caused by coronaviruses started in December 2019 in Wuhan, the capital of the Hubei province of China.^[1,2]

An increase in case numbers, especially due to the spread of COVID-19 disease, negatively affected levels of anxiety and stress, and there was an evident increase in these levels.^[3]

In epidemics, healthcare workers are the ones who have the closest and most frequent contact with infected people. The psychological status of healthcare workers, especially those working in emergency departments and

intensive care units, is most severely affected.^[4,5] Studies show that 45% of physicians and 50% of nurses have experienced burnout syndrome.^[6] Furthermore, in other studies, depression rates are higher in healthcare workers when compared to population levels.^[7] In light of all these findings, our study aims to investigate changes in perceived stress and burnout levels in healthcare workers. Results of our study show that because of intense working hours due to the pandemic, the infectiousness of the disease, working in risky environments, frequent shifts, and an increased number of patients lead to higher stress and burnout levels.

MATERIALS AND METHODS

This cross-sectional study was done on 110 healthcare workers working in the Neurosurgery Clinic. Participants of the study were composed of 37 physicians, 37 nurses,

and 36 auxiliary and operating room personnel.

In the provided personal information form, age, sex, level of education, marital status, professional title, experience in occupation (years), willingly selected occupation, desire

to change the occupation, satisfaction with payments, and duration of work were evaluated.

The 22-item Maslach Burnout Inventory, 14-item Perceived Stress Scale, and the demographic information form

Table 1. Sociodemographic Distribution of Study Cohort

Variable	Number (n)	Percentage (%)
Age		
18-29	39	35.5
30-39	40	36.4
40-59	28	25.5
60-65	3	2.7
Total	110	100.0
Sex		
Female	57	51.8
Male	53	48.2
Total	110	100.0
Education Level		
Primary School	3	2.7
Middle School	4	3.6
High School	21	19.1
University	39	35.5
Master's Degree / PhD	43	39.1
Total	110	100.0
Marital Status		
Married	65	59.1
Single	34	30.9
Divorced	11	10.0
Total	110	100.0
Professional Title		
Physician	37	33.6
Nurse	37	33.6
Other Healthcare Worker	36	32.7
Total	110	100.0
Duration of Work		
1-5	36	33.0
6-10	25	22.9
11-15	26	23.9
15 and higher	22	20.2
Total	109	100.0
Desire to Change the Occupation		
Yes	87	79.1
No	23	20.9
Total	110	100.0
Would change his/her profession if given the chance to		
Yes	77	70.0
No	33	30.0
Total	110	100.0
Satisfaction over Payments		
Satisfactory	11	10.0
Partially Satisfied	49	44.5
Unsatisfactory	50	45.5
Total	110	100.0

prepared by the researcher were applied to participants and the difference between scores between groups was analyzed.^[9]

Maslach Burnout Inventory: Maslach Burnout Inventory (MBI) is an inventory to measure burnout degrees of individuals, which was developed in 1981 by Maslach and Jackson. The inventory consists of 22 items with five-level Likert types and has three sub-dimensions.^[9]

MBI consists of three sub-dimensions: personal accomplishment, emotional exhaustion, and depersonalization. Sub-dimensions and items in the inventory are as follows:

1. Emotional Exhaustion: 1, 2, 3, 6, 8, 13, 14, 16, 18, 20 (0-36 points)
2. Depersonalization: 5, 10, 11, 15, 22 (0-20 points)
3. Personal Accomplishment: 4, 7, 9, 12, 17, 18, 19, 21 (0-32 points)

Higher points in emotional exhaustion and depersonalization mean increased burnout, and lower points in personal accomplishment mean decreased burnout levels. Items in the personal accomplishment sub-dimension are scored in reversed order. Inventory scores range from one to five.

Statistical Methods

To evaluate the findings of the study, the statistical analysis program SPSS (Statistical Package for the Social Sciences) version 25.0 (IBM Corp., Armonk, NY, USA) was used. All points derived from statistical analysis of continuous variables were evaluated for normality with descriptive and statistical methods. While evaluating study data, besides descriptive statistical methods (number, percent, mean, median, standard deviation, etc.), the T-test was used for comparisons of quantitative data between two groups, and analysis of variance (ANOVA) was used for more than two groups. Since MBI subdivisions were not homogeneously distributed, ANOVA was inapplicable. To test differences between groups, the Kruskal-Wallis Test was used.

Ethical Considerations

This study was conducted in accordance with the ethical principles outlined in the latest version of the Declaration of Helsinki. Ethical approval was obtained from the ethical committee of the hospital (No: I60622223), and informed

consent was obtained from all participants prior to their inclusion in the study.

RESULTS

The sociodemographic status of patients is summarized in Table 1. The mean of total points taken from the MBI personal accomplishment sub-dimension was higher for females when compared to males (Table 2). MBI emotional exhaustion points of those participants desiring to change their occupation were higher than those patients who do not desire to change their occupations. According to PSS means, the mean of individuals with master's degrees and Ph.D. (43.26) was highest, whereas the mean of individuals with primary and middle school education was lowest (38.71). When MBI emotional exhaustion points are taken into consideration, the mean of individuals with master's degrees and Ph.D. (20.09) was highest, whereas the mean of individuals with primary and middle school education was lowest (13.43). The mean MBI depersonalization total point was highest in individuals with master's degrees and Ph.D. (8.67), whereas it was lowest in individuals with high school education (4.57) (Table 3). The mean MBI personal accomplishment total point was found to be different between married and single individuals. The mean of married individuals was highest (20.14), whereas the mean of singles was lowest (16.12) (Table 4). According to PSS points, the mean of nurses was highest (43.78), and the mean of auxiliary personnel was lowest (39.56). Mean total MBI emotional exhaustion scores were highest in nurses (19.73) and lowest in auxiliary personnel (14.61). The mean total MBI depersonalization point was highest in physicians (8.76) and lowest in auxiliary personnel (5.28) (Table 5). An association between satisfaction with payments and PSS was detected. Individuals who found their payments insufficient had the highest mean PSS scores (44.46), whereas individuals who were satisfied with their payments had the lowest mean scores (39.91). Regarding satisfaction over payments categories, individuals who find their payments unsatisfactory have the highest means of MBI depersonalization (9.52), and individuals who find their payments satisfactory have the lowest means of MBI depersonalization (5.73) (Table 6).

Table 2. Results of T-test Analyses for PSS and MBI Subdivisions Total Points over Sex Categories

Total Points	Sex	Number of People	Mean	Standard Deviation	t	Degrees of Freedom	P
Perceived Stress Scale	Female	57	41.89	4.850	-0.419	108	0.676
Total Point	Male	53	42.28	4.853			
MBI Emotional Exhaustion	Female	57	17.72	7.907	-0.255	108	0.799
Total Point	Male	53	18.11	8.292			
MBI Depersonalization	Female	57	6.53	4.355	-1.930	108	0.056
Total Point	Male	53	8.68	7.108			
MBI Personal Accomplishment	Female	57	20.51	5.268	3.491	108	0.001
Total Point	Male	53	17.06	5.089			

Table 3. Results of ANOVA analyses for PSS and MBI subdivisions total points over education levels

Education Level	Number of People	Mean	Standard Deviation	F	p
Perceived Stress Scale Total Point					
Primary/Middle School	7	38.71	3.904	2.914	0.038
High School	21	40.48	4.996		
University	39	42.26	5.538		
Master's Degree/PhD	43	43.26	3.768		
Total	110	42.08	4.833		
MBI Emotional Exhaustion Total Point					
Primary/Middle School	7	13.43	6.997	3.158	0.028
High School	21	14.57	7.600		
University	39	18.10	8.143		
Master's Degree/PhD	43	20.09	7.764		
Total	110	17.91	8.060		
MBI Depersonalization Total Point					
Primary/Middle School	7	5.43	4.429	2.971	0.035
High School	21	4.57	4.069		
University	39	8.33	7.908		
Master's Degree/PhD	43	8.67	4.069		
Total	110	7.56	5.918		
MBI Personal Accomplishment Total Point					
Primary/Middle School	7	16.43	4.614	1.688	0.174
High School	21	20.95	4.706		
University	39	18.74	5.144		
Master's Degree/PhD	43	18.30	5.986		
Total	110	18.85	5.442		

Table 4. Results of ANOVA analyses for PSS and MBI subdivisions total points over marital status categories

Marital Status	Number of People	Mean	Standard Deviation	F	p
Perceived Stress Scale Total Point					
Married	65	42.26	5.091	0.198	0.820
Single	34	41.65	4.935		
Divorced	11	42.36	2.730		
Total	110	42.08	4.833		
MBI Emotional Exhaustion Total Point					
Married	65	18.26	8.146	1.008	0.368
Single	34	18.29	8.081		
Divorced	11	14.64	7.406		
Total	110	17.91	8.060		
MBI Depersonalization Total Point					
Married	65	6.97	4.552	1.477	0.233
Single	34	9.00	8.209		
Divorced	11	6.64	4.056		
Total	110	7.56	5.918		
MBI Personal Accomplishment Total Point					
Married	65	20.14	5.108	6.895	0.002
Single	34	16.12	4.766		
Divorced	11	19.64	6.637		
Total	110	18.85	5.442		

Table 5. Results of ANOVA analyses for PSS and MBI subdivisions total points over professional title categories

Professional Title	Number of People	Mean	Standard Deviation	F	p
Perceived Stress Scale Total Point					
Physician	37	42.84	3.797	8.755	0.000
Nurse	37	43.78	4.866		
Auxiliary Personnel	36	39.56	4.831		
Total	110	42.08	4.833		
MBI Emotional Exhaustion Total Point					
Physician	37	19.30	7.363	4.822	0.010
Nurse	37	19.73	8.258		
Auxiliary Personnel	36	14.61	7.725		
Total	110	17.91	8.060		
MBI Depersonalization Total Point					
Physician	37	8.76	3.947	4.237	0.017
Nurse	37	8.59	7.712		
Auxiliary Personnel	36	5.28	4.885		
Total	110	7.56	5.918		
MBI Personal Accomplishment					
Total Point					
Physician	37	18.11	5.953	1.145	0.322
Nurse	37	18.51	5.157		
Auxiliary Personnel	36	19.94	5.149		
Total	110	18.85	5.442		

Table 6. Results of ANOVA analyses for PSS and MBI subdivisions total points vs satisfaction over payments categories

Satisfaction Over Payment	Number of People	Mean	Standard Deviation	F	p
Perceived Stress Scale Total Point					
Satisfactory	11	39.91	3.477	13.694	0.000
Partially Satisfied	49	40.14	4.721		
Unsatisfactory	50	44.46	4.132		
Total	110	42.08	4.833		
MBI Depersonalization Total Point					
Satisfactory	11	5.73	5.934	5.425	0.006
Partially Satisfied	49	5.98	3.677		
Unsatisfactory	50	9.52	7.092		
Total	110	7.56	5.918		
MBI Personal Accomplishment					
Total Point					
Satisfactory	11	17.09	7.176	2.708	0.071
Partially Satisfied	49	20.14	5.264		
Unsatisfactory	50	17.96	5.006		
Total	110	18.85	5.442		

DISCUSSION

Of healthcare workers participating in our study, 52% were female and 48% were male. PSS, MBI emotional exhaustion, and MBI depersonalization scores did not show a significant difference between males and females (Table 2). The reason behind this is possibly the fact that healthcare workers in the hospital during the COVID-19 pandemic

are working under the same circumstances. Many studies on burnout also reported similar results. However, personal accomplishment, a sub-dimension of burnout level, has been demonstrated to be higher in females. Studies demonstrate that personal success points are associated with lower burnout levels. Therefore, the higher personal success of female personnel decreases their burnout levels compared to males. In a study conducted by Helvacı et

al.^[10] in 2013, contrary to expectations, the burnout levels of males were found to be higher than in females. With regards to depersonalization, many studies point out that depersonalization is more common in males. On the other hand, personal success is not associated with sex.

In a study that investigates female and male physicians' work-related stress and physical activity levels by Passey et al.,^[11] female physicians had high levels of physical activity and perceived stress levels, whereas male physicians had higher measurable stress but low physical activity levels. In another study done in India, perceived stress levels of physicians and nurses were reported to be similar (physicians = 18.35, nurses = 17.15). Our findings show that perceived stress levels are similar for females and males. In the study of Passey et al.,^[11] stress levels of female and male physicians were similar.

According to our studies, Post-Hoc (LSD) multiple comparisons results; mean MBI personal accomplishment points of married and single individuals were different. Other studies on marital status and personal accomplishment did not find any significant difference. The study of Çelmece et al.^[12] reports that the continuous anxiety point is higher in married individuals when compared to singles. Discrepancies between single and married individuals in our study can be described by the fact that married individuals have increased responsibilities towards their partners and children, whereas single individuals are only responsible for themselves, which leads to a more comfortable life economically and morally. In a study done with healthcare workers during the COVID-19 pandemic, emotional exhaustion was found to be higher in married participants.^[12]

In a meta-analysis done by Salari et al.,^[13] a linear correlation between higher education level and anxiety was found. This was explained by increased awareness associated with higher education. Higher levels of awareness of self, situations, and health could be the reason behind higher levels of anxiety.^[2] In another study supporting this data, individuals with primary school education have higher perceived social support.^[14,15] In our study, the mean PSS total point is significantly different concerning education levels. The mean total PSS scores of participants with master's degrees and Ph.D. vs. primary and middle school graduates were different. Participants with master's degrees and Ph.D. have the highest (43.26) and primary and middle school graduates have the lowest mean (38.71). Higher perceived stress in participants with higher education. Participants with higher education have higher expectations at their workplaces, and a mismatch between expectations and reality for these people can be a facilitating factor for higher stress levels.

Our study also signifies differences due to professional titles. Especially in auxiliary personnel (cleaning staff, technicians, secretaries, anesthesia technicians, security personnel), stress levels are different than physicians and nurses. Perceived stress levels of physicians and nurses are higher than auxiliary personnel. This can be explained

by increased direct contact with patients, treatment, and responsibilities brought on by patients, and involvement in every process in deteriorating patients. Similarly, when data on burnout subdivisions, including emotional exhaustion and depersonalization points, are evaluated, they are higher for physicians and nurses.

Payments (salaries) of workers associated with their jobs affect job satisfaction. Participants finding their payments satisfactory have lower PSS scores when compared to participants finding their payments unsatisfactory. Stress levels of individuals increase when they think that their payments don't meet their work. Similarly, when burnout levels are considered, unsatisfied healthcare workers have higher points. To sum up, personnel's payment satisfaction affects occupational burnout levels. The limitation of our study is the small sample size; thus, larger studies should be conducted in the following years. Higher burnout levels in physicians and nurses than auxiliary healthcare personnel are evaluated similarly to other studies in the literature.^[6,10,12] A similar situation is found in married participants who have lower levels of perceived stress when compared to singles. This situation, also seen in other studies, can be caused by relatively lower levels of responsibilities.^[12] Increased occupational burnout associated with higher educational levels can be due to the higher awareness of these participants, and some other studies in the literature report similar findings.^[16]

Ethics Committee Approval

This study approved by the Umraniye Training and Research Hospital Ethics Committee (Date: 23.06.2022, Decision No: 223).

Informed Consent

Retrospective study.

Peer-review

Externally peer-reviewed.

Authorship Contributions

Concept: E.V.; Design: Y.E.Ç.; Supervision: E.V., S.O.A.; Materials: F.A.; Data: F.A., Y.E.Ç.; Analysis: S.O.A.; Literature search: E.V.; Writing: E.V., F.A.; Critical revision: E.V., F.A.

Conflict of Interest

None declared.

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COVID-19 Pandemi Sürecinde Nöroşirürjideki Sağlık Çalışanlarının Algılanan Stres Seviyeleri ve Tükenmişlik Sendromları Arasındaki İlişkinin İncelenmesi

Amaç: COVID-19 hastalığı son dönemde tüm dünyayı etkisi altına almış ve ortaya çıkmasıyla birlikte insanların hayatında köklü değişikliklere neden olmuştur. Hastaneler ve sağlık personeli en çok etkilenen gruplar arasında yer almaktadır. Bu çalışmada, salgının sağlık çalışanları üzerindeki etkisinin; algılanan stres ve tükenmişlik düzeyleri değerlendirilerek araştırılması hedeflenmiştir.

Gereç ve Yöntem: Beyin ve Sinir Cerrahisi Kliniğinde görevli, doktorlar, hemşireler ve sağlık personelinde oluşan 110 kişilik grup çalışmaya dahil edildi. Veri toplama aşamasında demografik bilgi formu, Algılanan Stres Ölçeği-14 (ASS) ve Maslach Tükenmişlik Endeksi (MTE) kullanılmıştır.

Bulgular: Kadın ve erkek katılımcılar arasında ASS ve MTE skorları arasında anlamlı fark bulunamadı. Mesleğini değiştirmek isteyen katılımcılar, daha yüksek MTE skorlarına sahiptiler. Evli katılımcıların bekarlara göre daha yüksek kişisel başarı puanlarına sahip olduğu görüldü. Eğitim düzeyi arttıkça ASS skorunda artışın olduğu izlendi. Aldığı ücreti yetersiz bulan katılımcıların daha yüksek stres ve tükenmişlik seviyelerine sahip oldukları bulundu.

Sonuç: Doktor ve hemşire gruplarında diğer sağlık personeline oranla görülen yüksek tükenmişlik oranı önceki çalışmalar ile uyumlu bulundu. Bekarlara göre evli katılımcıların daha düşük stres oranlarına sahip olması da literatürle uyumlu izlendi. Bu bulgunun evli ve bekarlar arasındaki sorumluluk farkıyla ilgili olduğu düşünülüyor.

Anahtar Sözcükler: Algılanan stres; COVID-19; sağlık çalışanları; stres; tükenmişlik.