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Research Article

Assessment of the relationship between physical activity and burnout levels of healthcare professionals during the COVID-19 pandemic

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ABSTRACT

Objective: During outbreaks, healthcare workers may encounter mental health challenges, including an increased risk of infection and burnout. Physical inactivity due to widespread restrictions may significantly worsen these adverse effects. This study aims to assess burnout and physical activity levels among healthcare workers in hospitals during the COVID-19 outbreak and to examine the relationship between these factors.

Methods: This cross-sectional study involved 294 healthcare professionals, including nurses, midwives, health technicians, physiotherapists, laboratory technicians, and emergency medical technicians, working in outpatient or inpatient clinics at a university hospital, separate from the COVID-19-related study units. Research data were collected from November 10, 2021, to February 10, 2022. The Maslach Burnout Inventory, International Physical Activity Questionnaire, and a sociodemographic form were used as data collection tools.

Results: Among the participants included in the study, 63.9% were female, 36.1% were male, and the mean age was 29.40±6.39 (min: 19, max: 58). Additionally, 70.1% of the participants were employed in units related to COVID-19. The emotional exhaustion and desensitization subscales were higher in physicians and nurses working in COVID-19 units ($p<0.05$). Furthermore, 13.9% of the participants in this study met the criteria for sufficient physical activity levels. Physical activity levels were greater among single participants ($p<0.05$). However, there was no significant relationship between the participants' burnout status and physical activity levels ($p>0.05$).

Conclusion: This study found that burnout levels among physicians and nurses were higher than those of other healthcare professionals. Additionally, burnout levels were elevated in employees working in units related to COVID-19. The physical activity levels of healthcare professionals participating in our study were low. However, no significant relationship was observed between participants' burnout and physical activity levels.

Keywords: Pandemic, COVID-19, health personnel, physical activity, burnout

Introduction

In situations that cause mass trauma, such as the COVID-19 pandemic, healthcare workers are the group at the highest risk and most affected, playing a vital role in the healthcare system.[1] During these outbreaks, particularly those who manage cases directly, they may face mental

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health issues like burnout, along with a high risk of infection.[2] Burnout is an employee's inability to provide professional care for the people they serve while performing their job or their psychological distancing from their career as a response to excessive stress and dissatisfaction.[3] Today, burnout has become an increasingly significant issue, characterized by emotional fatigue, a diminished sense of personal accomplishment, and feelings of cynicism.[4]

Doctors and nurses are among the occupational groups at the highest risk for burnout. Factors such as workload, irregular and prolonged working hours, the challenge of understanding patients in difficult situations, the necessity of establishing a positive relationship with the patient, and the frequent need to take responsibility all contribute to increasing burnout.[5] Physical activity is a fundamental means of enhancing physical and mental health. Conversely, physical inactivity is a significant risk factor for cardiovascular and musculoskeletal disorders, type 2 diabetes, hypertension, certain oncological diseases, and psychological disorders.[6]

Physiological changes resulting from physical activity can reduce individuals' sensitivity to ongoing stress, enabling them to cope better with workplace stress without feeling overwhelmed. Consequently, this may decrease the risk of burnout.[7] Studies on the physical activity levels of healthcare workers indicate that physical activity levels are relatively low, while inactivity levels are high.[8,9]

Healthcare workers on the front lines of the COVID-19 outbreak faced an increased risk of burnout. They had limited opportunities for physical activity due to heavy workloads and challenging social conditions arising from restrictions. This study aimed to assess burnout and physical activity levels among healthcare workers during the COVID-19 pandemic and to explore the relationship between these factors.

Materials and Methods

Study design and participants

This cross-sectional study was conducted at a university hospital between November 10, 2021, and February 10, 2022. The study population consisted of physician residents and other healthcare professionals (nurses, midwives, health technicians, physiotherapists, laboratory technicians, and emergency medical technicians) who worked independently in units unrelated to COVID-19 at the university hospital. Our study population included 417 residents, 478 nurses, 24 laboratory technicians, 12 physiotherapists, 50 health technicians, and 67 emergency medical technicians, totaling 1048 individuals. The Epi Info program was used to calculate the sample size, aiming to reach at least 281 participants with a 50% prevalence and a 5% margin of error. Based on the percentages of the occupational groups in the population, we reached at least 112 residents, 129 nurses, and 40 other healthcare personnel.

Data collection

The Maslach Burnout Scale, which consists of 22 items and was adapted into Turkish by Ergin[10], the International Physical Activity Questionnaire, comprising 7 items along with a Turkish validity and reliability study conducted by Öztürk[11], and a sociodemographic data form, were utilized in the study. In the Maslach Burnout Scale, high scores on the emotional exhaustion and depersonalization subscales indicate significant levels of burnout. In contrast, low scores on the personal accomplishment subscale suggest high levels of burnout. Higher scores on the International Physical Activity Questionnaire are regarded as more favorable.

Data analysis

SPSS software for Windows (version 28.0; IBM Corp, Armonk, NY.) was used to evaluate and analyze

the data obtained from the study. The categorical variables in the study were presented as numbers and percentages to illustrate the distribution of patients, while numerical data were reported as means and standard deviations. Skewness-Kurtosis values were employed to determine whether the distribution of the variables was normal. Variables with a normal distribution were compared using the Student's t-test, while those not exhibiting a normal distribution were compared using the Mann-Whitney U and Kruskal-Wallis tests. The statistical significance level of the obtained data was interpreted with a "$p<0.05$" value.

Ethical approval

The ethics committee decision report numbered 20.478.486/947 was approved by the University Medical Faculty Health Sciences Ethics Committee on 22 September 2021. Additionally, approval was obtained from the Hospital's Director to conduct this research on hospital staff. During the study, informed written consent was acquired from the volunteers who agreed to participate.

Results

The research involved 294 participants, of whom 63.9% were female and 36.1% were male. Among them, 47.3% (n=139) were nurses, while 39.1% (n=115) served as residents. The mean age of the participants was 29.40±6.39 years (min: 19, max: 58). Additionally, 33.3% of participants lived alone, 47.6% cohabited with a spouse or children, and 56.5% had an income that equaled their expenses (Table 1).

Table 1. Distribution of participants according to sociodemographic characteristics

Variables		**n (%)**
Sex	Female	188 (63.9)
	Male	106 (36.1)
Occupation	Resident	115 (39.1)
	Nurse	139 (47.3)
	Physiotherapist	7 (2.4)
	Laboratory	15 (5.1)
	Health Technician	18 (6.1)
Marital Status	Single	150 (51.0)
	Married	140 (47.6)
	Other	4 (1.4)
Living Environment	Alone	98 (33.3)
	With Mother, Father, or Other Relative	37 (12.6)
	With Spouse, Children	140 (47.6)
	Other	19 (6.5)
Number of Children	No Children	202 (68.7)
	1 Child	60 (20.4)
	2 Children	29 (9.9)
	More Than 2 Children	3 (1.0)
Income Level	Less Than Expenses	67 (22.8)
	Equal to Expenses	166 (56.5)
	More Than Expenses	61 (20.7)
COVID-19 Related Unit Assignment	Yes	206 (70.1)
	No	88 (29.9)
	Total	294 (100)

Table 2. Participants' health status information

Variables		n (%)
Chronic Disease	Yes	59 (20.1)
	No	235 (79.9)
COVID-19	Diagnosed	76 (25.9)
	Not Diagnosed	218 (74.1)
Perceived health situation	Very Healthy	25 (8.5)
	Healthy	227 (77.2)
	Not Very Healthy	39 (13.3)
	Not Healthy at All	3 (1.0)

Among the participants, 70.1% work in a unit directly related to the pandemic, while 20.1% have at least one chronic disease. Additionally, 25.9% have been diagnosed with COVID-19, and 77.2% believe they are healthy (Table 2).

The mean total score on the Maslach Burnout Scale (MBS) for the participants was 68.32±9.76 (min: 44.0-max: 99.0) points. The mean scores for the MBS subscales were as follows: emotional exhaustion (EE) 28.18±6.67 (min: 12.0-max: 44.0), depersonalization (D) 11.76±4.43 (min: 5.0-max: 24.0), and personal accomplishment (PA) 28.36±5.41 (min: 13.0-max: 99.0).

When comparing employment in units related to COVID-19 with the sub-dimensions of the ITS, it was found that employees in these units experienced greater exhaustion than those who were not, regarding the total score, EE, and D subscale scores ($p<0.001$, $p = 0.027$, $p<0.001$, respectively). However, no statistically significant difference was observed in the MBS and its subscales among individuals diagnosed with COVID-19.

It was found that employees who felt unhealthy experienced greater exhaustion regarding DT and total scores from the sub-dimensions of MBS compared to those who felt healthy ($p=0.001$, $p=0.036$, respectively).

Physicians and nurses displayed statistically significantly higher levels of emotional exhaustion than other healthcare professionals ($p<0.001$ and $p=0.002$, respectively). In the depersonalization subgroup, physicians scored higher than nurses and other healthcare professionals ($p=0.001$ and $p<0.001$, respectively). Nurses scored significantly higher in the depersonalization subgroup than other healthcare professionals ($p=0.020$). When examining the relationship between the PA subgroup and occupation, physicians viewed themselves as more successful than nurses and other healthcare professionals ($p=0.014$ and $p=0.018$, respectively). No statistically significant difference was identified between nurses and other healthcare workers when assessing the PA subgroup ($p<0.05$) (Table 3).

45.6% of participants had low activity levels, with 40.5% not engaging in physical activity. Single participants exhibited significantly higher levels of physical activity ($p<0.05$). Comparing the scores obtained by participants in the sub-dimensions of the MBS regarding physical activity levels revealed no statistically significant difference in the evaluations of EE, D, and PA.

Discussion

This study highlights significant levels of burnout among healthcare workers, particularly in emotional burnout and depersonalization among those working in pandemic-related units. Doctors and nurses exhibited considerably higher emotional burnout and depersonalization than other healthcare workers, possibly due to the emotional demands of their roles. No significant association was found between activity level and burnout. However, most participants reported low or no physical activity, suggesting that the protective effects of physical activity may be limited under high-stress conditions such as the pandemic.

When analyzing the literature on the extent to which gender affects burnout, various results emerge. In this study, no significant relationship

Table 3. Comparison of Maslach Burnout Scores according to socio-demographic characteristics

Variables		Emotional exhaustion Mean±SD	Depersonalisation Mean±SD	Personal Achievement Mean±SD	Total Score Mean±SD
Sex	Female	28,68±6,88	11,27±4,42	28,16±5,54	68,12±10,32
	Male	27,30±6,21	12,64±4,35	28,72±5,18	68,66±8,71
Occupation†	Resident	29,12±6,17	13,25±4,12	27,10±5,59*	69,47±9,48*
	Nurse	28,48±6,63	11,27±4,39	29,00±5,04	68,76±10,07*
	Others	24,47 ±7,09	9,22±3,98	29,77±5,49	63,47±8,07
Marital Status#	Single	28,30±6,68	11,50±4,48	29,42±4,88*	69,23±9,69
	Married	28,07±6,68	12,00±4,39	27,40±5,70	67,49 ±9,78
Living Environment$	Alone	28,44±6,41	12,82±4,09*	27,18±5,47*	68,45±9,62
	Not Alone	28,05±6,81	11,23±4,51	28,95±5,30	68,25±9,85
Child(ren)	Yes	28,48±6,62	12,19±4,40	27,64±5,47	68,32±9,82
	No	27,54±6,77	10,83±4,39	29,94±4,95	68,32±9,68
Income Level	Less Than Expenses	29,35±6,16	11,83±4,56	28,08±5,11	69,28±9,43
	Equal to Expenses	28,04±7,16	11,65±4,46	28,39±5,56	68,08±9,43
	More Than Expenses	27,29±6,67	11,76±4,43	28,60±5,40	67,91±9,22
COVID-19 Related Unit Assignment$	Yes	28,74±6,70*	12,47±4,46*	28,51±5,44	69,74±9,78*
	No	26,87±6,46	10,11±3,91	28,01±5,36	65,00±8,91
Chronic Disease	Yes	28,01±6,62	11,18±4,8	29,28±5,32	68,49±9,16
	No	28,22±6,70	11,91±4,33	28,13±5,42	68,28±9,92
COVID-19	Diagnosed	28,84±6,16	12,22±4,31	28,17±5,35	69,23±10,03
	Not Diagnosed	27,95±6,84	11,61±4,48	28,43±5,44	68,00±9,66
Perceived health situation$	Healthy	27,67±6,52*	11,62±4,29	28,53±5,31	67,83±9,69*
	Unhealthy	31,23±6,82	12,61±5,21	27,38±5,93	71,23±9,74

*p<0.05 statistically significant.
#Student-t test, †Kruskal Wallis, $Mann-Whitney U test

was found between gender and burnout level. Similar findings were reported in the study conducted by Dinibütün et al.[12] In contrast, some research indicates that women's emotional exhaustion levels are higher.[13,14]

Most literature publications suggest no connection between marital status and burnout.[12,15] A study conducted on physicians during the COVID-19 pandemic in Türkiye found that marital status did not influence emotional exhaustion, depersonalization, or burnout.[13] In contrast to the literature, this study indicated that married participants had higher scores on the personal accomplishment subscale.

Healthcare workers are among the professional groups where burnout symptoms are most frequently encountered. Many studies show that nurses are more prone to burnout than other healthcare professionals.[16-18] In a study by Lasalvia et al., nurses and physician assistants were found to experience higher levels of burnout than other professions.[19] Sung et al. demonstrated that doctors and nurses are at greater risk for burnout than other health professionals.[20] This study reveals that the burnout status of healthcare professionals is high. However, since there was no analysis of the participants' burnout before the pandemic, the effect of the COVID-19 pandemic on this situation cannot be clearly expressed.

The impact of the living environment on burnout is a somewhat under-researched topic in the literature. In a study conducted by Elhadi et al. on healthcare workers, it was found that there was no relationship between lifestyle and three sub-dimensions of burnout.[15] This study revealed no statistical difference regarding the emotional exhaustion sub-dimension and total score. Lasalvia et al. emphasized that living alone increases emotional exhaustion and depersonalization.[19] This study identified a statistically significant difference between lifestyle and the depersonalization and low personal accomplishment subscales.

Healthcare workers on the front lines during the COVID-19 pandemic face challenges due to increased workloads, long hours, and the risk of exposure to positive cases.[21] The study by Arpacıoğlu et al. found that employees providing direct service to COVID-19 patients experienced statistically significant emotional exhaustion, depersonalization, and total scores.[22] In a study conducted with family physicians, it was found that emotional exhaustion and depersonalization rates increased with more frequent contact with COVID-19 patients.[23] Aligned with the studies in the literature, this study revealed that health professionals who provided direct service to COVID-19 patients experienced statistically significant emotional exhaustion, depersonalization, and total scores.

In a study conducted by Hoşgör et al. on 120 healthcare workers in Istanbul, no significant differences were found between the status of having a positive diagnosis of COVID-19 and all sub-dimensions of the burnout scale.[1] Similar to the literature, this study also found no significant difference between the status of having a positive diagnosis of COVID-19 and all sub-dimensions of the burnout scale. In contrast, the study conducted by Türkili et al. found high levels of depression and depersonalization in family physicians who were tested for COVID-19 and whose results were positive.[23]

In a study conducted by Çolak et al. on healthcare workers, physical activity levels were analyzed according to the International Physical Activity Questionnaire (IPAQ). It was found that 51.6% of the participants were inactive, 41.4% were lowly active, and only 6.9% had adequate physical activity levels.[24] In studies of healthcare workers before and after the COVID-19 pandemic, low physical activity levels remained similar.[25,26] A study involving healthcare workers in Singapore compared physical activity levels before and after the COVID-19 lockdown. It was found that significantly less physical activity was performed during the lockdown period.[27] Similarly, 45.6% of the participants in this study were found to have a low level of activity, 40.5% were not physically active, and 13.9% had an adequate level of activity.

When the literature was examined, a negative relationship between burnout and physical activity was identified in a significant portion of the studies comparing these two variables. However, some studies revealed no significant difference between burnout and physical activity. In the study conducted by Aydın et al. on nurses during the COVID-19 pandemic, no significant relationship was found between physical activity and burnout levels.[9] In the study conducted by Cecil et al. on medical faculty students, a negative relationship was identified between increased physical activity levels and Emotional Exhaustion levels; still, no significant relationship was observed between the two variables.[28] In the study analysis by Souza et al. on university students, physical activity was significantly associated with burnout symptoms, yet the adjusted model revealed no significant difference between the two.[29] Similarly, this study found no significant difference between physical activity and burnout.

Limitations of the study

This study has several limitations. First, it is confined to a university hospital; large-scale studies with more participants are recommended. Second, because resident physicians were included in the study, information could not be provided for other physicians.

Conclusion

This study demonstrates that burnout is a significant issue among healthcare professionals, particularly those working in pandemic-related units. Doctors and nurses exhibit the highest levels of emotional exhaustion and depersonalization. Living alone and being single are linked to low personal accomplishment. The emotional exhaustion and depersonalization subscales are elevated in those working in COVID-19-related units and among those experiencing burnout. When analyzing participants by gender, parental status, income level, chronic illness, and COVID-19 diagnosis, no differences in burnout are observed. The findings also indicate that most healthcare professionals engage in low or no physical activity, and no significant relationship is found between physical activity levels and burnout, aligning with some previous studies. Although the cross-sectional design and absence of pre-pandemic data restrict causal interpretations, the results underscore the need for targeted interventions to support the mental health and well-being of healthcare professionals (especially those in high-risk roles), regardless of lifestyle or demographic background. Future longitudinal studies are essential for better understanding the long-term effects of pandemic-related stressors on burnout and the potential protective roles of physical activity and other factors.

Ethical approval

This study has been approved by the Manisa Celal Bayar University, Faculty of Medicine Dean's Office, Health Sciences Ethics Committee (approval date 22.09.2021, number 20.478.486/947). Written informed consent was obtained from the participants.

Author contribution

The authors declare contribution to the paper as follows: Study conception and design: FÖ, MK, HE; data collection: MK; analysis and interpretation of results: MK, HE; draft manuscript preparation: MK, HE, FÖ. All authors reviewed the results and approved the final version of the article.

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Conflict of interest

The authors declare that there is no conflict of interest.

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