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ORIGINAL ARTICLE

Perceptions of Work and Educational Environment as Predictors of Burnout Among Residents During COVID-19 Pandemic

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ABSTRACT

Objective: Burnout negatively affects personal well-being by reducing job-related satisfaction besides deeply affecting physician lives outside the working environment. This study aimed to determine residents' burnout levels and related psychosocial risk factors regarding the work and educational environment during the COVID-19 pandemic at a university hospital.

Material and Method: Data were collected using an online questionnaire consisting of questions screening the participants' sociodemographic, clinical and, educational characteristics and the following scales; Postgraduate Hospital Educational Environment Measure (PHEEM), Maslach Burnout Inventory (MBI), Rosenberg Self Esteem Scale (RSES).

Results: Of the 632 residents receiving postgraduate education in clinical fields at the university, 99 (15.7%) participated in study, 77 (77.8%) of which reported that they were from medical branches and 12 (12.1%) from surgical branches.The emotional exhaustion (EE) dimension of burnout emerged as the most strongly related dimension with perceptions of the educational environment (PHEEM) (p<0,001, r=-0,548). The depersonalization (DP) dimension was only moderately associated with the perception of low role autonomy (p=0,006, r=-0,273). The low personal achievement (LPA) dimension of burnout, on the other hand, showed a moderate-high correlation with all the components related to the educational environment and showed the most substantial relationship with the perception of low social support (p<0,001, r=-0,372). Decrease in the organizational commitment with the departments and institutions where residents received training and worked was associated with higher levels of burnout and low self-esteem. 30.7% of the participants perceive their health as moderate/poor, and scored higher in all dimensions of burnout (EE p<0,001, DP p=0,001, LPA p=0,001).

Conclusion: In this study, we found that residents' perceptions about the educational environment are the variables most closely related to their burnout levels. With precautions, residents may be protected from burnout-related physical and mental diseases while academic efficiency increases and the healthcare service become more qualified.

Keywords: burnout, residency, COVID-19.

INTRODUCTION

The concept of burnout was first defined as physical and emotional exhaustion caused by weariness, failure, loss of power and energy, unmet demands [1]. Maslach interpreted burnout as a syndrome consisting of three dimensions: emotional exhaustion, depersonalisation, and low personal achievement [2]. When individuals cannot cope with the excessive demand in the workplace, they become insensitive to the people they serve. If this happens, they feel a mismatch between the contribution they expect to make to society or the institutions they work for and their current behaviors. As a result, they conclude that their achievements are insufficient [3].

Studies around the world have shown that approximately one-third to half of the physicians experience at least one dimension of burnout [4-6]. Burnout negatively affects personal well-being by reducing job-related satisfaction [7,8] besides deeply affecting physicians' lives outside the working environment [9]. When the effects of burnout in physicians on health are evaluated, it has been shown that it is associated with an increase in the risk of cardiovascular disease, short life expectancy, uncontrolled alcohol use, unhealthy interpersonal relationships, depression, and suicide [10,11]. Inevitably, burnout in physicians will directly or indirectly reflect on patients. Burnout, which results in deterioration in the mental and physical health of the physician, causes an increase in medical errors, late diagnosis, a decrease in the quality of patient care, and an increase in morbidity and mortality [10,12]. The World Health Organization (WHO) and the US National Institute of Medicine define the quality of health care in six dimensions: effectiveness, efficiency, safety, patient-centered care, accessibility, equity [13,14]. It is thought that physicians' burnout affects all six dimensions negatively [15].

Burnout is quite common among residents, one of the most critical service delivery stakeholders in health institutions where postgraduate education is provided [16,17]. Among the various factors that increase the risk of burnout in the workplace, the most common ones are high expectations regarding the health care service and academic obligations, long working hours, lack of autonomy, inconsistencies between home and work life, the perception of lack of reciprocity in professional relationships, and uncertainties about the future [18-21].

Regarding residents, the place defined as the workplace is also a learning environment where education and research are carried out together with health service delivery to gain postgraduate competencies. It has been suggested in the literature that adversities in the learning environment such as ones regarding characteristics of educators (teaching styles, levels of feedback, and support), residents' feelings of inadequacy, a vague sense of autonomy, the uncertainty of roles and responsibilities, harassment/intimidation problems, lack of education-service balance, negative relationships with peers, and wrong career choice contribute to burnout of the residents [22].

The unfavorable characteristics of the psychosocial aspects of the work and educational environment also contribute to burnout by causing low self-esteem, making the person feel unsuccessful in the workplace and interpersonal relations, and causing insufficient development of the physician identity [23]. This leads to many problems which have reflections on the individual and health care, including physical fatigue, mental depression, negative physician-patient relationships, and increased incidence of medical errors [16,22].

The pandemic process that we have been in since March 2020 has led to many changes and related problems that create physical and mental strain in the working and educational environment of residents and pose a risk of burnout [24] and related psychosocial problems [25]. Psychosocial problems arising from changes can increase the risk of burnout and adversely affect the physical and mental health of residents who are continuing postgraduate education besides providing health services under challenging conditions caused by the pandemic.

Determining the factors that cause burnout and impairment in residents' physical and mental health during the pandemic periods may guide the interventions to prevent burnout at the institutional level.

This study aimed to determine residents' burnout levels and related psychosocial risk factors regarding the work and educational environment during the

Covid-19 pandemic at Hacettepe University Faculty of Medicine.

MATERIALS AND METHODS

Sample and Data Collection

The participants of this descriptive study are residents continuing their postgraduate medical training in a clinical field (medicine or surgery) at Hacettepe University Faculty of Medicine. The information about the research, the invitation text, and the survey link was sent to the e-mail addresses of the residents. Data is collected with the electronic data collection method (Google Forms) between 14.10.2020 and 28.01.2021.

Measures

Data were collected using an online battery of study measures via Google forms consisting of questions screening the participants' sociodemographic, educational characteristics, related opinions and the following scales.

Postgraduate Hospital Educational Environment Measure (PHEEM): The scale was developed [26] for the evaluation of the postgraduate clinical education environment. The Cronbach's alpha reliability coefficient of the original form of the scale was 0.91, while that of the Turkish version was 0.94 [27]. The scale consists of 3 dimensions, including the perception of role autonomy, teaching, and social support, and a total of 40 items that are scored on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). To interpret the scores, the following scoring intervals are recommended: "very poor" = 0–40, "plenty of problems," = 41–80, "more positive than negative, but room for improvement" = 81–120, and "excellent" = 121–160. While the scores obtained from the role autonomy sub-dimension are evaluated from very poor to excellent; teaching subdimensions are evaluated as inferior quality to model teachers; social support sub-dimension can be interpreted from nonexistent to good a good supportive environment.

Maslach Burnout Inventory (MBI): The scale is developed especially for occupational fields that require face-to-face contact and aim to serve people directly [2] and defined by three subscales representing three dimensions of burnout: emotional exhaustion (EE), depersonalization (DP) and low personal accomplishment (PA). As the 7-point Likert-type response method in the original form of the scale was not found to be applicable for Turkish population in the adaptation study of the scale into Turkish, the study was conducted with a 5-point Likert-type version [28]. EE dimension (9 items, 0-36 points) refers to a decrease in the emotional and physical resources of the individual. DP dimension (5 items, 0-20 points) represents the interpersonal dimension of burnout and expressing negative, rigid attitudes towards the people served and unresponsiveness to work. The low professional accomplishment dimension (8 items,0-32 points) expresses the tendency of the person to evaluate himself negatively. Due to the different answering methods, the scores obtained from the subscales cannot be compared with the scores obtained due to the studies in which the original scale was used. In this study, the personal achievement subscale was scored in the opposite direction, and the expression 'low personal achievement' was used to facilitate analysis and interpretation. The increase in the scores obtained from the subscales corresponds to the increasing level of burnout. No "cut-off point" was used for the dimension scores since cut-off points have not been determined for Turkish population [29]. Although the subscales are related, they measure different concepts. Therefore, it is not possible to obtain a total burnout score and burnout level should be evaluated and interpreted separately for each dimension.

Rosenberg Self Esteem Scale (RSES): The ten-item subscale of the Likert-type scale (30) was used. The Cronbach alpha reliability coefficient of the Turkish version was 0.71 (31). A high score on the scale indicates low self-esteem. A score of 0-6 can be obtained from the scale, and those who score 0-1 are considered to have "high"; those who score 2-4 have "medium," and those who score 5-6 have "low" self-esteem.

Analysis of data

SPSS 23.0 package program was used to evaluate the data. All the data were evaluated in terms of a normal distribution by Kolmogorov-Smirnov, then, statistical tests were determined accordingly. Student t-test, Mann Whitney U test, ANOVA (Tukey post hoc test) and Kruskal Wallis tests are used. We approved significance levels as $p<0.05$, and did Bonferroni correction after ANOVA and Kruskal Wallis tests.

RESULTS

Of the 632 residents receiving postgraduate education in clinical fields at the university, 99 (15.7%) participated in study, 77 (77.8%) of which reported that they were from medical branches and 12 (12.1%) from surgical branches.

The sociodemographic characteristics of the residents participating in the study are shown in Table 1. The mean duration of residency is 25.8 (±15.6, IQR:24) months; the rate for 1 year or less, 1-3 years, and more than 3 years was 28%, 47.9%, was 24%, respectively. 56.8% of the residents stated that the reason for choosing the specialty was that it was their interest.

Residents' perceiving their health, having a disease diagnosed by the physician, applying to the physician for any physical/mental complaints in the last 3 months, finding the application process to the physician similar to the pandemic period is shown in Table 1. All but one of the 25 participants (25.3%) who stated that they had a current psychiatric disorder, reported being diagnosed before the pandemic. Ten residents reported that they continued psychiatric treatment during the pandemic period.

Table 2 shows the distribution of residents according to their Perceptions of Postgraduate Hospital Education Environment. Table 3 shows Postgraduate Hospital Educational Environment; Maslach Burnout Inventory, Rosenberg Self Esteem Scale results. PHEEM scale total score averages of those with a residency period of 1 year or less are statistically higher than those with residency training for 1-3 years and more than 3 years (1 year or less: 100.37 ±28.54; 1-3 years:79.4 ±24.49; > 3 years: 73.78 ± 29.42, p=0.001. Data not shown in the table).

The scores of the residents participating in the study on the PHEEM scale did not differ according to gender (p= 0.721), age group (p= 0.134) and an emotional relationship (p=0.871). MBI EE subscale score was not differed according to gender, age group, and being in an emotional relationship (having a partner) (respectively; p=0,812; p=0,811; p= 0,746); DP subscale score was not differed by gender, age group, and emotional relationship (respectively; p=0.681; p=0.715; p= 0.210). While the LPA subscale score did not differ according to

Table 1. Sociodemographic characteristics, physical and mental health, and treatment-seeking characteristics of the participants

Characteristics (n=99)	n (%)
Gender	
Female	61 (60.4)
Male	35 (35.4)
Doesn't want to specify	3 (3.0)
Age	
25-29 years	70 (70.7)
30 years and older	29 (29.3)
Marital status	
Married, lives with spouse	34 (34.3)
Single	63 (63.6)
Married, lives apart from spouse	1 (1.0)
Divorced	1 (1.0)
Child	
No	90 (89.1)
Yes	9 (8.9)
Perception of economic situation	
Bad	10 (9.9)
Middle	51(51.5)
Good	37 (37.4)
Very good	1(1.0)
People living together	
Parents	16 (15.8)
Friends	8 (7.9)
Spouse/children	34 (34.3)
Alone	32 (32.3)
Responsibility to care/ care liability/duty of care	
Yes	18 (17.8)
No	81(81.8)
Tobacco use	
No	69 (69.7)
Regularly	15 (14.9)
Sometimes	10 (10.1)
Quit	5 (5.0)
Alcohol consumption regularly	
No	41 (41.4)
Yes	12 (11.9
Sometimes	45 (45.5)
Quit	1 (1.0)
Perceived health	
Excellent	9 (8.9)
Good	59 (59.6)
Moderate	30 (29.7)
Bad	1 (1.0)
Diagnosed disease	
No	75 (75.8)
Yes, s/he is on medication	24 (23.8)
Consulting a physician for any physical/mental complaint in the last three months	
No	72 (72.7)
Yes	27 (26.7)
The similarity of the possibilities regarding the application and treatment process with the pre-pandemic period (n=27)	
Yes, similar	12 (44.4)
No, more difficult than pre-pandemic period	14 (51.9)
No, easier than pre-pandemic period	1 (3.7)

Table 2. Residents' perceptions about postgraduate hospital education environment

(n=99)	n (%)
Perceptions of role autonomy	
Very poor	5 (5.0)
A negative view of one's role	42 (42.4)
A more positive perception of one's job	37 (37.4)
Excellent perception of one's job	15 (14.9)
Perceptions of teaching	
Very poor quality	9 (8.9)
In need of some retraining	38 (38.4)
Moving in the right direction	36 (36.4)
Model teachers	16 (15.8)
Perceptions of social support	
Non-existent	7 (6.9)
Not a pleasant place	46 (46.5)
More pros than cons	35 (35.4)
A good supportive environment	11 (10.9)
PHEEM totally	
Very poor	5 (5.0)
Plenty of problems	39 (39.4)
More positive than negative but room for improvement	43 (43.4)
Excellent	12 (11.9)

Abbreviations: PHEEM, Postgraduate Hospital Educational Environment Measure

Table 3. Participants' PHEEM, MBI and RSES

Scores (Min-Max)	Mean	SD
PHEEM		
Perceptions of role autonomy (0-53)	30,0	10,4
Perceptions of teaching (2-58)	32,6	12,1
Perceptions of social support (0-40)	22,4	7,7
Totally (2-147)	**84,9**	**28,8**
MBI		
Emotional exhaustion (1-34)	19,3	7,5
Depersonalization (1-18)	9,0	4,1
Low personal acomplishment (3-28)	13,6	4,7
RSES (0-4,84)	1,5	1,0

Abbreviations: PHEEM, Postgraduate Hospital Educational Environment Measure; MBI, Maslach Burnout Inventory; RSES, 27 Self Esteem Scale

age group and emotional relationship (respectively; p=0.930; p=0.525), women scored higher on this subscale than men (14.4/12.0) (p=0.016). There was no relationship between the duration of residency and levels of burnout and self esteem (emotional exhaustion p=0.151, depersonalization p=0.756, low personal achievement p=0.531, RSES p=0.930). The scores obtained from the RSES did not differ according to gender, age group, and emotional relationship (respectively; p=0.137; p=0.912; p= 0.122).

Participants who stated that they had been treated for a psychiatric illness in the past had similar scores on all three subscales of the MBI and RSES (EE: p= 0.575; DP: p= 0.550; LPA: p = 0.965; RSES: p=0.304). Emotional burnout scores of those who have received psychiatric treatment in the past and those currently on treatment are higher than those who are not on treatment. ((24,1 ±7,3/17,4 ±5,5), p =0,026).

30.7% of the participants perceive their health as moderate/poor (Table 1), and showed higher

burnout in all sub-dimensions. Participants who perceive their health as moderate/poor scored higher in all dimensions of burnout compared with those who perceive their health as good/very good (p<0.001, p=0.002, p=0.001 respectively, Table 4). Table 4 shows the relationship of residents' burnout levels and self-esteem scores with perceptions of education and work environment characteristics and their health. Residents who had applied to a physician with any physical and mental complaints in the last 3 months were compared with those who did not apply for any complaint. The scores of both groups on EE (p=0.345), DP (p=0.749), LPA (p=0841), and RBSS (p=0.116) were found to be similar. The rate of those who are satisfied with being a resident was 38.4%; moderately satisfied was 34.3%; dissatisfied was 27.3%. 10.1% of the residents stated that they thought of quitting residency frequently; 57.6% occasionally; 32.1% never thought of quitting. 73.7% of the participants stated that they had to give up their interests/hobbies during the residency process, the reasons why they gave up is 82.2% could not find enough time; 16.4% did not have physical energy; 1.4% reported that were no longer interested and enjoy it. When the views on the physical conditions of the working and educational environments are examined, the rate of those who are not satisfied was 39.3%; moderately satisfied was 31.3%; dissatisfied was 39.3%.

The PHEEM total score and subscale score averages of the participants who felt organizational commitment and those who did not, differed in terms of both the total score and the subscale scores (Table 5). The findings of the correlation analysis of the PHEEM, MBI Subscales, and RSES are shown in Table 6.

DISCUSSION

In this study we aimed to determine residents' burnout levels and related psychosocial risk factors regarding the work and educational environment during the Covid-19 pandemic at a university hospital and found that that residents' perceptions about the educational environment were found to be the variables that are most closely related to

Table 4. The relationship of residents' MBI, EE, DP, PA, RSES with perceptions of education and work environment and perceptions of health

	EE		DP		PA		RSES	
	Mean (SD)	p	Mean (SD)	p	Mean (SD)	p	Mean (SD)	p
If you had the chance to choose again, would you choose the same department?								
Yes (n=50)	15,6 (6,8)*	<0,001	8,1(4,3)	0,014 †	11,7(4,2)*	<0,001	1,1 (0,8)*	0,001
No (n=26)	24,6 (5,9)		11,0(3,3)		16,0(4,3)		1,9(1,1)	
Undecided (n=23)	21,6 (6,5)		8,5 (3,9)		14,9(4,5)		1,9(1,0)	
If you had the chance to choose again, would you choose the institution?								
Yes (n=35)	15,9 (7,2)*	<0,001	7,8(4,1)*	0,003	12,1(4,1)*	0,053	1,0(0,2)	0,034
No (n=31)	23,5 (6,1)		11,0(3,4)		15,3(5,2)		1,7(0,9)	
Undecided (n=33)	19,1 (7,4)		8,3(4,2)		13,5(4,4)		1,6(0,9)	
What is the education-service balance of your department?								
The education is more important. (n=18)	14,8 (6,5) ‡	0,001	8,2(4,5)	0,066	12,7(4,2)	0,138	1,1(0,9)	0,112
The service is more important. (n=53)	21,8(6,7)		9,9(3,9)		14,5(5,0)		1,6(0,9)	
Balanced (n=28)	17,8(8,1)		7,8(4,2)		12,6(4,2)		1,5(1,1)	
Do you feel organizational commitment to your institution?								
Yes (n=57)	18,0(7,9)	0,075	8,8(4,3)	0,549	12,9(3,9)	0,261	1,5(1,1)	0,293
No (n=42)	21,9(6,7)		9,4(4,2)		14,8(5,9)		1,7(0,8)	
What do you think is the level of your own health?								
Excellent/Good	17,4 (7,3)	<0,001	8,1(4,2)	0,002	12,6 (4,8)	0,001	1,5 (0,9)	0,350
Moderate/Bad	23,6 (6,3)		10,0 (3,4)		15,7 (3,8)		1,7 (1,1)	

Scores compared using ANOVA, Kruskall Wallis, Tukey, Student t test, Mann Whitmey U

*The difference is due to the "Yes" group, † The difference is between the Yes-No group, ‡ The group from which the difference originate

Abbreviations: MBI, Maslach Burnout Inventory; EE, Emotional exhaustion; DP, Depersonalisation; PA, Low personal achievement; RSES, Rosenberg Self Esteem Scale; SD, standard deviation

Table 5. PHEEM scores according to feeling organizational commitment of participants

	Feeling organizational commitment		p
	Yes	No	
	Mean (sd)	Mean (sd)	
PHEEM			
Perceptions of role autonomy	33,3 (9,7)	24,4 (10,2)	<0,001
Perceptions of teaching	36,6 (11,3)	26,1 (11,3)	<0,001
Perceptions of social support	25,4 (7,2)	18,4 (6,9)	<0,001
Totally	95,2 (26,9)	69,0 (26,6)	<0,001

Abbreviations: PHEEM, Postgraduate Hospital Educational Environment Measure

Table 6. Correlation analysis of the PHEEM, MBI subscales scores and RSES

	EE, P (rs)	DP, P (rs)	PA, P (rs)	RSES, P (rs)
PHEEM				
Perceptions of role autonomy	<0,001 (-0,585)	0,006 (-0,273)	<0,001 (-0,317)	0,031 (-0,217)
Perceptions of teaching	<0,001 (-0,879)	0,092 (-0,170)	<0,001 (-0,340)	0,010 (-0,258)
Perceptions of social support	<0,001 (-0,512)	0,039 (-0,207)	<0,001 (-0,372)	0,002 (-0,305)
Totally	<0,001 (-0,548)	0,024 (-0,227)	<0,001 (-0,356)	0,008 (-0,265)
Maslach Burnout Inventory				
Emotional exhaustion (EE)				<0,001 (0,357)
Depersonalization (DP)				0,004 (0,287)
Low personal acomplishment (PA)				0,030 (0,218)

Abbreviations: PHEEM, Postgraduate Hospital Educational Environment Measure; MBI, Maslach Burnout Inventory; EE, Emotional exhaustion; DP, Depersonalisation; PA, Low personal achievement; RSES, Rosenberg Self Esteem Scale; SD, standard deviation; rs, Pearson or Spearman correlation coefficient

their burnout levels. Decrease in the organizational commitment with the departments and institutions where residents received training and worked was associated with higher levels of burnout and low self-esteem. Another important finding of the study is that perception of health was closely related to all dimensions of burnout. These results indicates that, with precautions, residents may be protected from burnout-related physical and mental diseases while academic efficiency increases and the healthcare service become more qualified.

In a study conducted in Saudi Arabia, most residents stated a decrease in educational activities during the pandemic; most emphasized the decline in surgical practice and indicated that they did not feel psychologically ready even though they had time to study. It was stressed that junior residents felt more insecure and vulnerable [32]. A study conducted with obstetrics residents in Italy emphasized that education came to a standstill during the pandemic. Most of the residents stated that their education was irreversibly interrupted. 84% of the residents indicated that they were worried about the future; there was no significant relationship between seniority and the level of anxiety [33]. In a study conducted in Italy, surgical residents stated that clinical and surgical training activities were interrupted, and they had to leave the operating rooms to support the covid areas [34]. When we examined the examples of good practice aiming to turn the current process into an opportunity in terms of education, we did not find any examples of good practice in the literature in the context of our country. In this context, we examined studies from around the world.

The Relationship Between Burnout and Educational Environment

Residents, who have experienced significant disruptions in their education processes due to the pandemic, are under a heavy burden due to increased workload and psychosocial stress. It is estimated that this situation increases their predisposition to burnout in all dimensions. One of the factors that increase this predisposition is the educational environment. When the studies on the factors associated with the burnout levels of resident physicians are reviewed, it has been observed that residents' perceptions about the educational environment significantly affect their

burnout levels [21,22,35,36]. In this study, we found that residents' negative perceptions about different dimensions of the educational environment showed a positive relationship with all three dimensions of burnout (Table 6).

In a study from Thailand, 88% of the pediatric residents had a positive perception of their role autonomy, 51% thought that teaching activities needed some improvement, and for the social support, most (85%) thought that there were more pros than cons [37]. When this study is compared with the results of our study, it has been shown that resident physicians' perceptions of various dimensions of the educational environment were more positive and not associated with burnout. However, in the findings obtained from qualitative interviews with residents to revealed that trainers and teaching styles, feelings of inadequacy related to the level of knowledge, assignments that are not related to the education come to the fore as educational environment variables associated with burnout [37].

In our study, the emotional exhaustion sub-dimension of burnout emerged as the most strongly related sub-dimension with perceptions of the educational environment. The depersonalization sub-dimension was only moderately associated with the perception of low role autonomy. The low personal achievement sub-dimension of burnout, on the other hand, showed a moderate-high correlation with all the components related to the educational environment and showed the most substantial relationship with the perception of low social support. In a study conducted in Greece, perceptions about the hospital education environment were statistically negatively correlated with the level of burnout [38]. This shows that the positive evaluation of the clinical learning environment is inversely proportional to the burnout levels. In the same study, it was observed that social support, one of the PHEEM subscales, was negatively associated with burnout. At the same time, autonomy and teaching sub-dimensions were significantly and negatively related to burnout. The residents stated that the most crucial stress factor leading to high burnout was workload [36].

In our study, the perception of social support showed a significant relationship with all burnout dimensions. Social support also includes relationships with seniors, peers, and educators in the hospital environment where learning and service delivery occur together [26]. Vendeloo et al. [21], in their study with orthopedic residents in Belgium, concluded that the learning environment feature that showed the most vital relationship with burnout symptoms was weak peer collaboration. A study conducted in Greece showed that peer interaction was negatively correlated with low personal achievement sub-dimension of burnout, in line with the results of our research results. In the same study, it was found that those who think that the trainers, which is another essential component of social support, value to postgraduate education, show less burnout in all sub-dimensions [39]. These researches and ours suggest that both the peer relationship and the support relationship established with the educators are protective against burnout. However, due to the assignments in the COVID-19 clinics and intensive care units, many residents have been away from the learning environments where they received specialty training during the COVID-19. Contact with peers and seniors in the same specialty or with faculty members has decreased considerably. It has also become impossible for residents to receive feedback due to limited training opportunities. This may be why the perception of social support of most resident physicians participating in our study was not satisfactory. Peer and faculty member interaction, which is one of the most important determinants of social support, should be supported and increased regardless of the circumstances.

In this study, having a negative perception of professional autonomy was associated with all dimensions of burnout. In parallel with these results, Zubairi [40] revealed the relationship between lack of autonomy and burnout in his study with resident physicians from different fields. Papaefstathiou et al. [38] found the PHEEM autonomy sub-dimension significantly and negatively related to burnout's personal and work-related exhaustion sub-dimensions (CBI scale). There are also studies in the literature that have not found a relationship between the perception of low autonomy and the level of burnout [22,35]. Efforts to train competent specialist physicians require balancing supervision and autonomy. Professional autonomy supports the intrinsic motivation of individuals and prevents

burnout. Given the opportunity for autonomy, the residents reason, develop a plan and take charge of his patient [41]. It is essential for faculty members to recognize their residents and support their autonomy with tasks appropriate to their proficiency level and the characteristics of the educational environment.

Negative perceptions of all three dimensions of the educational environment have shown the most vital relationship with the emotional exhaustion sub-dimension of burnout. Papaefstathiou [38] stated that negative perceptions about the quality of education (measured by the PHEEM scale) were significantly and negatively related to personal and work-related burnout (measured by the CBI). Puranitee [37], on the other hand, did not find a relationship between perception of educational quality and burnout. In our study, the emotional exhaustion scores of residents who reported that the education-service balance was dominant in the direction of service were higher than those who noted that the balance was prevalent in the order of education. This finding parallels that those with more negative perceptions of the educational environment showed more emotional burnout. This result suggests that one of the reasons for the negativity related to the educational environment is the greater emphasis on service than education. Similarly, Ferguson et al. has associated poor service-education balance with high burnout levels [22].

Consequences of Burnout

Since the research was conducted during the COVID-19 pandemic, new challenges have been added to postgraduate education. It should be taken into account that residents' perceptions of their educational environment may have been significantly affected by the challenges associated with the pandemic.

In this study, some factors related to burnout (the characteristics of psychosocial and residency training) that have significant consequences for residents' physical and mental health and the patients they serve were investigated. It was seen that the features most associated with burnout were related to the educational environment and burnout levels were related to negative perceptions of the educational environment. Still, it should be taken into account that this relationship may be bidirectional. The unbalancing education service during the pandemic period and the disruptions in the education environment may have contributed to the burnout of the residents. In addition, it should be taken into account that burnout may have caused negative perceptions and dissatisfaction with educational environments.

In our study, it was seen that the negative perceptions of residents about the educational environment during the pandemic period led to a decrease in their organizational commitment with the departments and institutions where they received training and worked and this decrease was associated with higher levels of burnout and low self-esteem. Additionally, residents who stated that they would prefer a different specialty and institution if they had the chance had high burnout levels and had lower self-esteem levels (Table 6). Based on these results, it is impossible to infer the direction of the relationship between burnout and organizational commitment since the study is cross-sectional. However, it was thought that their negative perceptions about the educational environment mediated the relationship between burnout and organizational commitment. Improvement of the educational environment will reduce the risk of burnout by contributing to the organizational commitment of residents and positively affecting their professional identities and self-esteem, which is a concept closely related to their professional identities.

Burnout of residents negatively affects their own physical and mental well-being and reduces the efficiency of the health care they provide to patients. In this study, 30.7% of the participants perceive their health as moderate/poor and showed higher burnout in all sub-dimensions. Burnout, which is associated with a decrease in the ability to empathize with the patients served, a reduction in the motivation to work, and an increase in medical errors, directly affects the health service delivery. In a systematic review [7], it was stated that the increase in the burnout level of residents negatively affects patient safety and quality health care delivery. Another study [42], emphasized that burnout in residents increased medical errors, and increased medical errors deepened burnout. Interventions to prevent burnout of residents during postgraduate education are significant for their wellness and the patients they serve.

According to the Turkish Medical Association research conducted in our country before the COVID-19 pandemic, it was determined that two out of three assistant physicians worked 9-12 hours a day on weekdays [43]. According to the same study, it was determined that working hours negatively affected the social lives of three out of four residents. It is essential to organize work hours to protect the physical and mental health of residents. The excessive workload can negatively affect physical and mental health, making it impossible to spare time for social life and causing adverse health effects through burnout. Considering the uncertainties in working conditions, sudden assignments, and the workload in the pandemic areas during the COVID-19 process burnout is an issue that should be taken into account by faculties, associations, the Ministry of Health.

Limitations

Only 99 (15.7%) of 632 residents in clinical specialties participated in the study and great proportion (77.8%) of the participants were from medical branches (12.1% from surgical branches). The research coincided with the pandemic period (between 7-10 months), in which the number of COVID-19 cases and deaths accelerated in our country . In addition to the responsibilities of the residents regarding the education and working environment in their departments, additional responsibilities related to their assignments in the COVID-19 fields, the significant increase in the workload, and the lack of motivation may have caused low participation in this research. All these reasons constitute limitations of the study.

CONCLUSION

In this study, we found that residents, perceptions about the educational environment are the variable most closely related to their burnout levels. The educational environments and well-being of residents, which may be related to their burnout, need to be constantly evaluated and improved. In this extraordinary period, there is a greater need for innovative teaching methods and the guidance of accreditation institutions to ensure residents' competencies.

Action plans to deal with the challenges posed by large-scale emergencies such as the COVID-19 pandemic must be ready in advance. There is a need for plans to increase the communication between residents, faculty members, institution directors, and social support. Today, we should consider burnout not as an individual problem caused only by personal factors but as a process that originates from the work environment and organizational culture and negatively affects the health service of the entire institution.

Author contribution

Study conception and design: BA, MİY, and CIY; data collection: BA, MİY, and CIY; analysis and interpretation of results: BA, MİY, and CIY; draft manuscript preparation: BA, MİY, and CIY. All authors reviewed the results and approved the final version of the manuscript.

Ethical approval

The study was approved by the Hacettepe University Non-Interventional Ethics Committee (Protocol no. 20/168).

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Conflict of interest

The authors declare that there is no conflict of interest.

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