

Distinct psychological correlates of burnout dimensions among healthcare workers

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Abstract

Objective: Burnout is a multidimensional construct consisting of emotional exhaustion, depersonalization, and reduced personal accomplishment. Although psychological distress and psychological resources have both been linked to burnout, less is known about their differential associations with specific burnout dimensions. This study aimed to examine the associations of psychological symptom levels, fear of COVID-19, psychological resilience, meaning in life, and gratitude with the dimensions of burnout among healthcare workers.

Materials and Methods: A cross-sectional study was conducted with 104 healthcare workers employed at a university hospital. Participants completed self-report measures assessing burnout, psychological symptom levels, fear of COVID-19, psychological resilience, meaning in life, and gratitude. Pearson correlation analyses and hierarchical multiple regression analyses were performed.

Results: Psychological symptom severity was independently positively associated with emotional exhaustion, whereas psychological resilience was independently negatively associated with emotional exhaustion. Presence of Meaning and psychological resilience were independently negatively associated with reduced personal accomplishment. Depersonalization showed a different and more mixed pattern, and the psychological variables entered in the final step did not collectively account for a statistically significant increment in explained variance. Fear of COVID-19 was not independently associated with any of the three burnout dimensions.

Conclusion: The findings indicate that burnout dimensions may show partly distinct patterns of association with psychological and demographic characteristics. Psychological distress and lower resilience were particularly associated with emotional exhaustion, whereas lower Presence of Meaning and lower resilience were associated with reduced personal accomplishment. Findings regarding depersonalization were more mixed and should be interpreted cautiously. These results support examining burnout dimensions separately and warrant confirmation in larger and longitudinal studies.

Keywords: burnout, healthcare workers, psychological resilience, meaning in life, psychological distress

Introduction

Healthcare workers may be confronted with intense professional and psychological demands during pandemics, natural disasters, and other extraordinary circumstances that place strain on healthcare systems. Such periods of crisis may adversely affect the mental

health of healthcare workers and have been associated with increased burnout [1]. During the COVID-19 pandemic, numerous studies were conducted on the mental health of healthcare workers. Specifically, depression, anxiety, sleep problems, and other indicators of psychological distress were examined extensively [2,3]. Nevertheless, understanding the

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factors associated with psychological functioning among healthcare workers continues to be an important area of inquiry beyond the pandemic.

Burnout is defined as a psychological response to chronic work-related stressors and is particularly prevalent among human service professionals [4,5]. According to the Maslach model, burnout consists of three dimensions: emotional exhaustion, depersonalization, and reduced personal accomplishment. Emotional exhaustion refers to feeling that one's emotional resources have been depleted, whereas depersonalization reflects the development of detached and impersonal attitudes toward those receiving care. The personal accomplishment dimension encompasses individuals' evaluations of their professional competence and effectiveness. Although these dimensions are conceptualized as components of the same construct in the Maslach model, research suggests that the subdimensions of burnout may be associated with different antecedents and outcomes.

Psychological symptom levels have been consistently associated with burnout among healthcare workers. The association between general psychological symptom levels and burnout has been demonstrated in various studies and systematic reviews. This association has been consistently reported, particularly with regard to depressive symptoms, anxiety symptoms, and indicators of general psychological distress [6,7]. With the emergence of the COVID-19 pandemic, researchers began to examine not only general psychological distress but also the effects of pandemic-specific threat perceptions on the mental health of healthcare workers. In this context, fear of COVID-19 has been considered one of the important variables associated with mental health and psychological functioning [8].

In addition to psychological distress, individual psychological resources may be relevant to burnout. Within the Job Demands-Resources framework, personal resources have been conceptualized as characteristics that may facilitate adaptation to occupational demands [9-11]. In the present study, three domains of psychological resources were examined: psychological resilience, meaning in life, and gratitude. These constructs represent distinct psychological characteristics that may be relevant to adaptation under stressful circumstances. Psychological resilience

reflects the capacity to recover from adversity, meaning in life reflects the integration of experiences within a framework of purpose and values, whereas gratitude reflects the recognition and appreciation of positive experiences and sources of support.

Psychological resilience refers to an individual's capacity to adapt to stress and adversity and to recover from challenging experiences [12]. Meaning in life reflects the extent to which individuals perceive their lives as meaningful, purposeful, and coherent [13]. Gratitude is defined as the tendency to recognize and appreciate positive experiences and sources of support in one's life [14]. Although these variables represent different domains of psychological resources, each has been shown to be associated with psychological well-being and mental health. While the associations of psychological resilience and meaning in life with burnout among healthcare workers have been demonstrated in various studies, gratitude has been associated with psychological well-being and other positive psychological indicators [14] and has also been considered a potential protective factor against burnout among healthcare professionals [15].

The existing literature indicates that both indicators of psychological distress and psychological resources are associated with burnout. However, it remains unclear whether psychological distress and psychological resources show similar or different associations with specific dimensions of burnout. In particular, studies that simultaneously examine psychological distress indicators and psychological resources within the same model and compare their associations with different dimensions of burnout remain relatively limited. Therefore, the present study aimed to examine the associations of psychological symptom levels, fear of COVID-19, psychological resilience, meaning in life, and gratitude with emotional exhaustion, depersonalization, and reduced personal accomplishment among healthcare workers.

Based on the existing literature, we hypothesized that higher levels of psychological distress and fear of COVID-19 would be associated with higher levels of burnout, whereas greater psychological resilience, meaning in life, and gratitude would be associated with lower levels of burnout.

Materials and Methods

Study design

This study was conducted as a cross-sectional correlational study aiming to examine the associations of psychological symptom levels, fear of COVID-19, psychological resilience, meaning in life, and gratitude with different dimensions of burnout among healthcare workers. Data were collected online using self-report measures.

Participants

The study sample consisted of 104 healthcare workers employed at a university hospital. Participants were recruited through online data collection procedures, and the sample was formed using convenience sampling. Participation was voluntary, and informed consent was obtained from all participants. The study was approved by the Hacettepe University Non-Interventional Clinical Research Ethics Committee (GO 21/1019; December 21, 2021). Demographic characteristics of the participants are shown in Table 1.

Note. Values are presented as n (%) for categorical variables and mean $\pm$ standard deviation for age. Percentages were calculated based on available data; one participant had missing information on physical illness.

Measures

Maslach burnout inventory

The Maslach Burnout Inventory, developed by Maslach and Jackson, was used to assess participants' levels of burnout [4]. Normative data for Turkish healthcare personnel were reported by Ergin [16]. The scale consists of three subscales: emotional exhaustion, depersonalization, and personal accomplishment. In the present study, the three subscales were analyzed separately. Scores on the personal accomplishment subscale were coded such that higher scores indicated reduced personal accomplishment, reflecting higher levels of burnout in this dimension. Accordingly, this outcome is referred to as reduced personal accomplishment in the analyses and reporting of the

present study. In the present sample, Cronbach's alpha coefficients were .88 for emotional exhaustion, .70 for depersonalization, and .77 for reduced personal accomplishment.

Brief symptom measure-25

Brief Symptom Measure-25 (BSM-25) was used to assess participants' psychological symptom levels. The scale is a self-report measure that assesses psychological symptoms experienced during the recent period. The Turkish version of the scale has been shown to provide a reliable and valid assessment of psychological symptom levels [17]. In the present study, the total score, representing participants' overall level of psychological distress, was used. The Cronbach's alpha coefficient in the present sample was .95.

Fear of COVID-19 scale

The Fear of COVID-19 Scale, developed by Ahorsu et al., was used to assess participants' levels of fear related to COVID-19 [8]. The Turkish adaptation of the scale was conducted by Satici et al.[18]. The scale consists of seven items and assesses individuals' emotional fear responses to COVID-19. The Turkish version of the scale has demonstrated adequate validity and reliability. The Cronbach's alpha coefficient in the present sample was .85.

Brief resilience scale

The Brief Resilience Scale, developed by Smith et al., was used to assess psychological resilience [12]. The Turkish adaptation of the scale was conducted by Doğan [19]. The scale consists of six items and assesses an individual's capacity to recover from stress and adversity. The Cronbach's alpha coefficient in the present sample was .90.

Meaning in life questionnaire

The Meaning in Life Questionnaire, developed by Steger et al., was used to assess meaning in life [13]. The Turkish adaptation of the scale was conducted by Demirbaş [20]. The scale consists of two subscales: Presence of Meaning and Search for Meaning. The Presence

Table 1. Sociodemographic characteristics of participants (N = 104).

Variable	n (%) / M ± SD	Min-max
Age, years	42.71 ± 9.21	25-65
Gender		
Female	69 (66.3)	
Male	35 (33.7)	
Professional group		
Physician	44 (42.3)	
Nurse	26 (25.0)	
Other healthcare workers	34 (32.7)	
Marital status		
Single	26 (25.0)	
Married	78 (75.0)	
Education level		
High school	5 (4.8)	
Associate degree	7 (6.7)	
Bachelor's degree	33 (31.7)	
Graduate degree or higher	59 (56.7)	
Physical illness		
No	79 (76.7)	
Yes	24 (23.3)	
Receiving psychological help due to mental health problems		
No	91 (87.5)	
Yes	13 (12.5)	

of Meaning and Search for Meaning subscales were analyzed separately. The Cronbach's alpha coefficients in the present sample were .84 for Presence of Meaning and .89 for Search for Meaning.

Gratitude questionnaire (GQ-6)

The Gratitude Questionnaire, developed by McCullough et al., was used to assess gratitude [14]. The Turkish adaptation of the scale was conducted by Yüksel and Oğuz Duran [21]. The scale assesses individuals' tendencies to recognize and appreciate positive experiences and sources of support in their lives. The Cronbach's alpha coefficient in the present sample was .64.

Statistical analysis

Data were analyzed using IBM SPSS Statistics version 25. Descriptive statistics were calculated for all study variables, and relationships among variables were examined using Pearson correlation analysis. Separate hierarchical multiple regression analyses were conducted for emotional exhaustion, depersonalization, and reduced personal accomplishment. Age and gender were entered in Step 1 as demographic covariates.

Age and gender were retained as demographic covariates because they are among the demographic characteristics most frequently examined in the healthcare-worker burnout literature [22]. Psychological symptom severity and fear of COVID-19 were entered in Step 2, followed by gratitude, Presence of Meaning, Search for Meaning, and psychological

resilience in Step 3. Thus, the final regression models included eight predictor variables. The hierarchical order was specified a priori to examine whether the psychological variables of primary interest explained additional variance after accounting for demographic characteristics, general psychological distress, and fear of COVID-19. All variables included in the regression analyses had complete data; therefore, the analytic sample size was $N = 104$ for each regression model. One participant had missing information on physical illness, which was not included in the regression analyses.

Regression assumptions and model robustness were examined comprehensively. Residual normality was evaluated using histograms and normal P-P plots; linearity and homoscedasticity were assessed using plots of standardized residuals against standardized predicted values; independence of errors was evaluated using the Durbin-Watson statistic; and multicollinearity was assessed using tolerance and variance inflation factor (VIF) values. Potentially unusual or influential observations within the analytic sample were additionally examined using studentized deleted residuals, Mahalanobis distance, leverage values, and Cook's distance.

Given the sample size and the number of predictors in the final models, a sensitivity power analysis based on the noncentral F distribution was conducted to determine the minimum overall regression effect size (Cohen's f^2) that could be detected with 80% power under the available design [23].

The analysis was based on the final model containing eight predictors, a total sample size of $N = 104$, $\alpha = .05$, and a target power of 80%. The corresponding numerator and denominator degrees of freedom were 8 and 95, respectively. The analysis quantified the minimum overall regression effect size (Cohen's f^2) that could be detected with 80% power under the available design.

Results

Descriptive statistics and correlation analyses

Demographic characteristics of the participants are presented in Table 1. Descriptive statistics and Pearson correlation coefficients for the variables examined in the study are shown in Table 2.

Correlation analyses indicated that emotional exhaustion was positively associated with psychological symptom severity and Search for Meaning, and negatively associated with psychological resilience, gratitude, and Presence of Meaning. Depersonalization was positively associated with psychological symptom severity and Search for Meaning, and negatively associated with psychological resilience, gratitude, and Presence of Meaning. Reduced personal accomplishment was positively associated with psychological symptom severity and Search for Meaning, and negatively associated with psychological resilience, gratitude, and Presence of Meaning. Fear of COVID-19 was positively correlated with psychological symptom severity and

Table 2. Descriptive statistics and Pearson correlations among study variables ($N = 104$).

Variable	M	SD	Min	Max	1	2	3	4	5	6	7	8	9
1. DP	4.88	3.34	0	14	—								
2. EE	15.62	6.57	2	36	.56**	—							
3. RPA	9.85	3.98	1	23	.34**	.41**	—						
4. BSM-25	58.76	24.82	26	132	.35**	.49**	.27**	—					
5. COVID-19 Fear	12.93	4.92	7	29	.06	.07	.04	.30**	—				
6. Gratitude	29.73	6.15	15	42	-.22*	-.25*	-.34**	-.26**	-.04	—			
7. Presence	27.11	5.36	11	35	-.28**	-.35**	-.52**	-.37**	.00	.51**	—		
8. Search	17.25	7.73	5	35	.38**	.33**	.22*	.44**	.19*	-.30**	-.50**	—	
9. Resilience	20.55	5.19	6	30	-.29**	-.46**	-.45**	-.35**	-.25*	.32**	.44**	-.45**	—

DP = Depersonalization; EE = Emotional Exhaustion; RPA = Reduced Personal Accomplishment; BSM-25 = Brief Symptom Measure-25 total score. Higher RPA scores indicate greater burnout. * $p < .05$. ** $p < .01$.

Table 3. Hierarchical multiple regression analyses of factors associated with burnout dimensions.

Predictor / statistic	Step 1	Step 2	Step 3
Emotional Exhaustion			
Age, β	-.306**	-.194*	-.122
Gender, β	-.088	-.096	-.105
Psychological Symptoms, β	—	.463***	.362***
Fear of COVID-19, β	—	-.059	-.116
Gratitude, β	—	—	-.046
Presence of Meaning, β	—	—	-.036
Search for Meaning, β	—	—	.024
Psychological Resilience, β	—	—	-.278**
R ²	.110	.299	.383
Adjusted R ²	.092	.271	.331
ΔR^2	.110	.189	.084
ΔF	6.242	13.353	3.218
p for ΔF	.003	<.001	.016
Depersonalization			
Age, β	-.303**	-.250*	-.219*
Gender, β	.192*	.208*	.189*
Psychological Symptoms, β	—	.293**	.174
Fear of COVID-19, β	—	.055	.018
Gratitude, β	—	—	-.034
Presence of Meaning, β	—	—	.002
Search for Meaning, β	—	—	.234*
Psychological Resilience, β	—	—	-.074
R ²	.109	.204	.267
Adjusted R ²	.092	.172	.205
ΔR^2	.109	.095	.063
ΔF	6.190	5.909	2.028
p for ΔF	.003	.004	.097
Reduced Personal Accomplishment			
Age, β	-.240*	-.188	-.080
Gender, β	-.050	-.051	-.069
Psychological Symptoms, β	—	.228*	.056
Fear of COVID-19, β	—	-.012	-.023
Gratitude, β	—	—	-.091

β = standardized regression coefficient. Step 1 included age and gender; Step 2 additionally included psychological symptom severity and fear of COVID-19; Step 3 additionally included gratitude, Presence of Meaning, Search for Meaning, and psychological resilience. ΔR^2 = change in explained variance relative to the preceding model. Dashes indicate that the variable was not entered at the respective step. Higher reduced personal accomplishment scores indicate greater burnout. *p < .05. **p < .01. ***p < .001.

Table 3. Continued.

Predictor / statistic	Step 1	Step 2	Step 3
Presence of Meaning, β	—	—	-.392**
Search for Meaning, β	—	—	-.159
Psychological Resilience, β	—	—	-.275**
R^2	.064	.112	.361
Adjusted R^2	.046	.076	.308
ΔR^2	.064	.048	.249
ΔF	3.472	2.664	9.267
p for ΔF	.035	.075	<.001

β = standardized regression coefficient. Step 1 included age and gender; Step 2 additionally included psychological symptom severity and fear of COVID-19; Step 3 additionally included gratitude, Presence of Meaning, Search for Meaning, and psychological resilience. ΔR^2 = change in explained variance relative to the preceding model. Dashes indicate that the variable was not entered at the respective step. Higher reduced personal accomplishment scores indicate greater burnout. * $p < .05$. ** $p < .01$. *** $p < .001$.

Search for Meaning but was not significantly associated with any of the three burnout dimensions (Table 2).

The results of the hierarchical multiple regression analyses examining the independent associations of the study variables with the three burnout dimensions are shown in Table 3.

Examination of regression diagnostics did not indicate substantial violations of the assumptions of linear regression. Residual distributions and normal P-P plots were broadly consistent with normality, while plots of standardized residuals against standardized predicted values did not indicate marked departures from linearity or homoscedasticity. Durbin-Watson statistics ranged from 1.920 to 1.987, and VIF values ranged from 1.124 to 1.833, providing no indication of problematic error dependence or multicollinearity. A small number of relatively large studentized deleted residuals were observed. However, complementary influence diagnostics, including leverage and Cook's distance, did not indicate that individual observations exerted undue influence on the regression models (maximum Cook's $D = .099$). The sensitivity analysis indicated that, with $N = 104$ and eight predictors, the final regression models had 80% power to detect an overall effect of approximately $f^2 = .156$ at $\alpha = .05$.

In Step 1, age and gender accounted for 11.0% of the variance in emotional exhaustion ($R^2 = .110$, $p = .003$). The addition of psychological symptom severity and fear of COVID-19 in Step 2 explained an additional

18.9% of the variance ($\Delta R^2 = .189$, $p < .001$). In Step 3, the addition of gratitude, Presence of Meaning, Search for Meaning, and psychological resilience accounted for a further significant 8.4% of the variance ($\Delta R^2 = .084$, $p = .016$). The final model was statistically significant, $F(8, 95) = 7.36$, $p < .001$, explaining 38.3% of the variance in emotional exhaustion ($R^2 = .383$, adjusted $R^2 = .331$). In the final model, psychological symptom severity showed a significant positive independent association with emotional exhaustion ($\beta = .362$, $p < .001$), whereas psychological resilience showed a significant negative independent association ($\beta = -.278$, $p = .006$). The remaining variables were not statistically significant in the final model.

In Step 1, age and gender accounted for 10.9% of the variance in depersonalization ($R^2 = .109$, $p = .003$). The addition of psychological symptom severity and fear of COVID-19 in Step 2 explained an additional 9.5% of the variance ($\Delta R^2 = .095$, $p = .004$). The variables entered in Step 3 accounted for an additional 6.3% of the variance; however, this increment did not reach statistical significance ($\Delta R^2 = .063$, $p = .097$). The final model was statistically significant, $F(8, 95) = 4.32$, $p < .001$, explaining 26.7% of the variance in depersonalization ($R^2 = .267$, adjusted $R^2 = .205$). In the final model, age was negatively associated with depersonalization ($\beta = -.219$, $p = .027$), whereas gender ($\beta = .189$, $p = .045$) and Search for Meaning ($\beta = .234$, $p = .038$) showed significant positive independent associations. The remaining variables were not statistically significant in the final model.

In Step 1, age and gender accounted for 6.4% of the variance in reduced personal accomplishment ($R^2 = .064$, $p = .035$). The addition of psychological symptom severity and fear of COVID-19 in Step 2 accounted for an additional 4.8% of the variance, although this increment did not reach statistical significance ($\Delta R^2 = .048$, $p = .075$). In Step 3, the addition of gratitude, Presence of Meaning, Search for Meaning, and psychological resilience accounted for a substantial and statistically significant additional 24.9% of the variance ($\Delta R^2 = .249$, $p < .001$). The final model was statistically significant, $F(8, 95) = 6.72$, $p < .001$, explaining 36.1% of the variance in reduced personal accomplishment ($R^2 = .361$, adjusted $R^2 = .308$). In the final model, Presence of Meaning ($\beta = -.392$, $p = .001$) and psychological resilience ($\beta = -.275$, $p = .008$) showed significant negative independent associations with reduced personal accomplishment. The remaining variables were not statistically significant in the final model.

Discussion

In the present study, the associations of psychological symptom severity, fear of COVID-19, psychological resilience, meaning in life, and gratitude with three dimensions of burnout were examined among healthcare workers. The findings revealed partly distinct patterns of association across the burnout dimensions. Emotional exhaustion was independently associated with greater psychological symptom severity and lower psychological resilience, whereas reduced personal accomplishment was independently associated with lower Presence of Meaning and lower psychological resilience. Depersonalization showed a somewhat different pattern: younger age, male gender, and higher Search for Meaning were independently associated with depersonalization in the final model, although the variables entered in Step 3 did not collectively account for a statistically significant increment in explained variance. Taken together, these findings support examining the dimensions of burnout separately rather than treating burnout as a unidimensional construct.

One of the prominent findings of the present study was the independent positive association between psychological symptom severity and emotional exhaustion. This finding suggests that emotional exhaustion may be linked not only to work-related fatigue but also to a broader pattern of psychological

distress. The observed association is consistent with previous studies and systematic reviews demonstrating substantial relationships between psychological symptoms and burnout [6,7]. Given the cross-sectional design, however, the direction of this relationship cannot be determined.

Psychological resilience was also independently and negatively associated with emotional exhaustion. Psychological resilience refers to an individual's capacity to recover from stress and adversity [12]. The present finding is consistent with previous research demonstrating inverse associations between resilience and burnout among healthcare workers [24,25]. Although resilience may theoretically represent an important psychological resource in the context of occupational stress, the cross-sectional nature of the present findings does not allow it to be interpreted as a causal protective factor.

For reduced personal accomplishment, Presence of Meaning and psychological resilience showed significant independent negative associations in the final model. Of these two significant associations, Presence of Meaning had the larger absolute standardized coefficient ($\beta = -.392$). Individuals reporting a stronger established sense of meaning in life therefore tended to report lower levels of reduced personal accomplishment. This finding is consistent with previous research linking a stronger sense of purpose and meaning in life with lower levels of burnout and psychopathology among healthcare workers [26].

One possible interpretation is that maintaining a broader sense of meaning and purpose may be associated with more favorable perceptions of professional competence and accomplishment, particularly under conditions of occupational stress. However, the present study assessed meaning in life rather than work-specific meaning. Therefore, any interpretation linking Presence of Meaning specifically to meaning derived from professional roles should be regarded as tentative.

Presence of Meaning and Search for Meaning showed different patterns in relation to reduced personal accomplishment. Whereas Presence of Meaning remained independently associated with reduced personal accomplishment in the final model, Search for Meaning did not. This difference is consistent with the conceptual distinction between Presence of Meaning and Search for Meaning [13], suggesting that these two

dimensions may relate differently to burnout. Presence of Meaning reflects the experience of an established sense of meaning and purpose, whereas Search for Meaning reflects an active orientation toward finding or deepening meaning [13].

Psychological resilience was also independently associated with lower reduced personal accomplishment. Individuals with greater resilience may be better able to maintain functioning and a sense of effectiveness when facing occupational setbacks and stressful experiences. However, longitudinal studies are needed to determine whether resilience helps maintain professional accomplishment over time.

Depersonalization showed a different pattern from the other two burnout dimensions. In the final model, younger age and male gender were independently associated with higher depersonalization, and Search for Meaning also showed a significant positive individual association. Importantly, however, the addition of the variables entered in Step 3 did not collectively produce a statistically significant increment in explained variance ($\Delta R^2 = .063$, $p = .097$). The association between Search for Meaning and depersonalization should therefore be interpreted cautiously and warrants replication before firm conclusions are drawn regarding its independent role.

The negative association between age and depersonalization may reflect processes related to professional experience or adaptation to occupational demands. Younger healthcare workers may have had less opportunity to develop strategies for managing sustained occupational stress. However, because professional experience was not directly assessed, age should not be interpreted as a proxy for experience, and the mechanisms underlying this association remain to be examined.

Male participants also reported higher depersonalization scores. This finding should be interpreted cautiously given the smaller male subgroup ($n = 35$) and because potential explanatory factors such as working conditions, organizational characteristics, and interpersonal coping styles were not assessed. Larger and more balanced samples are needed before firm conclusions regarding gender differences in depersonalization can be drawn.

More broadly, depersonalization is characterized by detached and emotionally withdrawn attitudes toward

individuals receiving care or services [5]. Organizational and occupational factors not assessed in the present study may therefore also be relevant to this dimension. Previous research among healthcare professionals during the COVID-19 pandemic has linked perceptions of the work and educational environment with burnout, highlighting the potential importance of contextual factors [27].

Taken together, the findings indicate that the three burnout dimensions were characterized by partly distinct patterns of association. Emotional exhaustion was independently associated with psychological distress and resilience, whereas reduced personal accomplishment was associated with Presence of Meaning and resilience. Depersonalization showed a more mixed pattern involving demographic characteristics and Search for Meaning, although the incremental contribution of Step 3 was not statistically significant. These differences support examining burnout dimensions separately, as reliance solely on an overall burnout score may obscure potentially meaningful distinctions among emotional exhaustion, depersonalization, and reduced personal accomplishment.

Fear of COVID-19 was not independently associated with any of the three burnout dimensions in the final regression models. Although fear of COVID-19 was correlated with psychological symptom severity, its coefficients were not statistically significant after the other variables were considered. This pattern suggests that the unique association between COVID-19 fear and burnout was limited in the present sample. However, given the cross-sectional design and the specific context and timing of data collection, this finding should not be interpreted as evidence that pandemic-related fear is generally unrelated to burnout. The absence of an independent association between fear of COVID-19 and burnout may also have been influenced by contextual factors that were not assessed in the present study, including differences in occupational exposure and institutional working conditions. Therefore, fear of COVID-19 as an individual emotional response should be distinguished from the broader occupational and psychosocial burden associated with working during the pandemic. The heterogeneity of professional groups in our sample should also be considered when interpreting the absence of an independent association between fear of COVID-19 and burnout. The sample included physicians, nurses, and other healthcare workers, whose

levels of patient contact, occupational responsibilities, perceived infection risk, and psychosocial burden may have differed. Therefore, the absence of a significant association in the overall sample does not exclude the possibility that the relationship between COVID-19-related fear and burnout may differ across professional groups. Larger studies with sufficient power for subgroup analyses are needed to examine these potential differences.

Gratitude was significantly correlated with all three burnout dimensions but was not independently associated with them in the final regression models. This pattern may partly reflect shared variance with other psychological resources such as resilience and meaning in life. However, the relatively modest internal consistency of the Gratitude Questionnaire in the present sample ($\alpha = .64$) may also have attenuated associations involving gratitude. Accordingly, the absence of significant independent associations should be interpreted cautiously rather than as evidence that gratitude is unrelated to burnout. Previous experimental and correlational research has also linked gratitude with higher psychological well-being and positive affect [14,28].

Several limitations should be considered when interpreting the present findings. First, the cross-sectional design precludes conclusions regarding the temporal or causal direction of the observed associations. Although hierarchical regression allowed us to examine associations with each burnout dimension while accounting for the other variables in the models, the findings should not be interpreted as evidence that these factors prospectively predict or causally influence burnout. Longitudinal studies are needed to clarify the temporal relationships among psychological distress, psychological resources, and burnout. Second, the relatively modest sample size should be considered when interpreting the regression findings. A sensitivity analysis indicated that the available sample ($N = 104$) provided 80% power to detect an overall regression effect of approximately $f^2 = .156$ in the final eight-predictor models. Thus, the study had reasonable sensitivity to approximately moderate overall effects, but smaller overall effects and, importantly, smaller unique or incremental effects may have been insufficiently powered. This consideration is particularly relevant to the depersonalization model, in which the variables entered in Step 3

accounted for an additional 6.3% of the variance but the increment did not reach statistical significance. Replication in larger samples is therefore warranted. Third, participants were recruited using convenience sampling from a single university hospital, which may limit the generalizability of the findings to healthcare professionals working in other institutions, occupational settings, or sociocultural contexts. The smaller male subgroup ($n = 35$) also warrants caution when interpreting the observed association between gender and depersonalization. Fourth, all study variables were assessed using self-report measures, which may have introduced common method variance and response-related biases. Moreover, the internal consistency of the Gratitude Questionnaire was relatively modest in the present sample ($\alpha = .64$), which may have attenuated associations involving gratitude. Findings concerning gratitude should therefore be interpreted with particular caution. Fifth, online recruitment may have introduced selection bias, as healthcare workers who chose to participate may have differed systematically from those who did not participate. Finally, detailed occupational and organizational characteristics, such as workload, working hours, direct exposure to patients with COVID-19, and perceived organizational support, were not assessed. Such factors may account for additional variance in burnout dimensions and may be particularly relevant to depersonalization.

The present study demonstrated partly distinct patterns of association between psychological characteristics and the three dimensions of burnout among healthcare workers. Emotional exhaustion was independently associated with greater psychological symptom severity and lower psychological resilience, whereas reduced personal accomplishment was independently associated with lower Presence of Meaning and lower psychological resilience. Depersonalization showed a different and more mixed pattern involving age, gender, and Search for Meaning, although the variables entered in Step 3 did not collectively account for a statistically significant increment in explained variance. These findings highlight the value of examining burnout as a multidimensional construct rather than relying solely on an overall burnout score. Longitudinal studies with larger and more diverse samples are needed to determine the temporal nature of these associations and to clarify their potential relevance for interventions aimed at healthcare-worker well-being.

Author contributions

Conception and design: T.D., M.İ.Y.; Data acquisition: T.D., M.İ.Y.; Data analysis: T.D.; Data interpretation: T.D., M.İ.Y.; Drafting of the manuscript: T.D.; Critical revision of the manuscript: T.D., M.İ.Y. All authors reviewed the results, approved the final version of the manuscript, and agreed to be accountable for all aspects of this study.

Ethical approval

This study was approved by the Hacettepe University Non-Interventional Clinical Research Ethics Committee (Date: December 21, 2021, Decision/Protocol No: GO 21/1019). Informed consent was obtained from all participants involved in this study.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflict of interest

The authors declare that this study was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Generative AI statement

The authors declare that during the preparation of this study, the following AI-assisted technology was used: ChatGPT on April-August 2026. Extent of Use: ChatGPT was used during manuscript preparation to assist with English language editing, improving the clarity and organization of the text, refining the presentation of statistical results, and supporting literature exploration. All cited sources were independently checked against the original publications, and all statistical analyses and

numerical results were independently conducted and verified by the authors. The authors confirm that they have critically reviewed and edited any AI-generated content and take full responsibility for the integrity, accuracy, and originality of the publication. The authors certify that the original human contribution is maintained and that AI-assisted tools are not listed or cited as authors.

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