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Original article

Physician Burnout Scale: A Reliability and Validity Study

Huseyin Selvi[1], **Turhan Toros*[2], *Asena Ayca Ozdemir*[1], *Ibrahim Bashan*[1]

[1]Department of Medical Education, Medical Faculty, Mersin University, Mersin; [2]Department of Sports Sciences, Mersin University, Mersin

Abstract. *Study Objectives:* Although occupational burnout is experienced at different levels in different professions, it is an important problem affecting individuals' quality of life and work efficiency. While burnout exists in almost every profession, it is more common in professions that require intensive physical and mental work and constant interaction with people such as medicine. There is no measurement tool developed solely for physicians which can reliably and validly measure physicians' burnout levels in Turkey. This study aimed to present a scale developed directly for physicians on physician samples that can measure their burnout levels reliably and validly. *Methods:* Data were collected from a total of 479 physicians. The KMO value calculated to determine the suitability of the data for factor analysis was found to be 0.944. The chi-square statistics calculated as a result of the Barlett test were also significant (chi-square = 20381.76, p <0.01). *Results:* The findings obtained via exploratory factor analysis demonstrated that the developed scale was composed of 5 factors and explained 68.15% of the total variance. RMSEA= 0,08; CFI= 0.96; NFI: 0.95; NNFI: 0.96; RMR= 0.062 values obtained from confirmatory factor analysis showed that the model had a good fit. Alpha reliability of the whole scale was calculated as 0.98. In addition, the Cronbach alpha reliability values obtained for the factors were found as 0.96; 0.96; 0.88; 0.91 and 0.77, respectively. *Conclusions:* The findings obtained in this study show that the developed scale offers high reliability and validity values.

Key words: Burnout, Occupational Burnout, Physician Burnout Scale

Introduction

Occupational burnout is an important problem affecting individuals' quality of life and work efficiency, although it is experienced at different levels in different professions. Burnout was defined for the first time in the literature by Freudenberger (1974, p.159) as "becoming exhausted by making excessive demands on energy, strength, or resources" in the workplace". Maslach and Jackson (1981) explained burnout as a three-component structure, including emotional exhaustion, depersonalization, and personal accomplishment, and developed the first burnout scale with these components. Emotional exhaustion is the feeling of being emotionally exhausted by work; depersonalization points to unemotional and impersonal behavior towards individuals who are served or cared for at work and lack of personal accomplishment is explained as the inability of individuals to overcome problems and to regard themselves as inadequate in their work (1).

Symptoms of burnout differ among individuals and these symptoms include depression, cynicism, decreased self-esteem, decreased self-confidence devaluation, anger and sarcastic attitudes in the affective area; impatience, frequent outbursts of anger, inability to relax, absenteeism formwork, overreaction, abusing drugs or alcohol, superficial communication, and suicide attempts in behavioral terms; low energy, feelings of fatigue, sleep disturbances, headache, digestive problems, palpitations, weight loss, shortness of

breath, negative changes in concentration and frequent illnesses in somatic terms and denial, blame, rationalization, reflection and displacement in cognitive terms (2).

Although burnout is observed in almost every profession, it is more common in professions that require intensive physical and mental overtime and constant interaction with people (3-6). In line with this, it can be argued that one of the most common occupational groups affected by burnout is physicians. This profession can be physically and psychologically quite challenging on physicians due to intensive very busy schedules, frequent shifts, constant interaction with patients and their relatives, and immense responsibility for the health and lives of their patients. These elements can push physicians to depression and burnout. Previous studies show that individuals' professions, personalities, environmental factors, and demographic characteristics significantly affect burnout (7,8).

Many studies have been conducted in the literature to measure burnout reliably, validly and to present what causes burnout. Table 1 summarizes the measurement tools used in measuring burnout. Table 1 includes various scales developed at different periods and on different groups to reveal individuals' burnout levels (9-16). These scales show that none of them were developed at the national level on a sample of physicians and to measure physicians' burnout levels. On the other hand, the adaptation of the developed scales to different languages, different cultures, and different professions creates various reliability and validity problems (17).

Hence, the burnout data obtained from the physicians using the scales that are available in the literature may not be sufficiently reliable and valid. For this reason, these scales, which are frequently used in the literature but have been developed on different individuals and professions, may be insufficient in demonstrating physicians' burnout levels reliably and validly.

Medicine includes knowledge, skills, and practices directly related to human health and life. On the other hand, it is a profession that requires intense working hours, constant interaction with patients and their relatives, and immense responsibility for human health and life. Therefore, physicians' burnout levels may include different dimensions and should be extensively studied. For this reason, this study aimed to presents a scale developed directly on and for physicians that can measure physicians' burnout levels reliably and validly.

Materials and Method

In this study, it was aimed to develop a measurement tool that reliably and validly reveals the burnout levels of physicians. For this reason, the study can be considered basic research. Ethics committee approval was obtained for the study (05.03.2021-03).

Sample/study group

Data obtained within the scope of the study were collected from physicians using a scale trial form by the researchers. Since this was a scale development study, sampling was chosen by the purposive sampling method to reveal the ranges of the variable attempted to be measured. Klein (2005) stated that a sample of 200 people was sufficient to extract reliable factors in scale development studies. For this reason, data were collected from a total of 479 physicians who practiced medicine. Of these participants, 219 (47.7%) were male, 240 (52.3%) were female; 309 were married (67.3%), 150 were single (32.7%); 90 (19.6%) were primary care physicians, 93 (20.3%) were assistant physicians, 186 (40.5%) specialist physician, 39 (8.5%) were minor assistant physicians, 18 (3.9%) assistant professors, 24 (5.2%) served as associate professors and 9 (2%) served as professor doctors. In order to confirm the resulting factor structure and provide additional evidence for the validity, data were collected again from a different sample of 156 people using the developed scale for confirmatory factor analysis.

Measurement Tool

Literature reviews were conducted to determine the items to be included in the draft form of the scale developed to reveal physicians' burnout levels and available scales developed for similar purposes were examined for this purpose. At the same time, physicians

Table 1. Scales developed to demonstrate individuals' burnout levels

Name of Scale	Number of Items	Type	Dimensions
Maslach Burnout Inventory (Maslach and Jackson,1981)	22	7 point Likert type Self report	Emotional exhaustion Depersonalization Lack of personal accomplishment
Burnout Measure (Pines and Aronson, 1988)	21	7 point Likert type Self report	Emotional Exhaustion Mental Exhaustion Physical Exhaustion
Oldenburg Burnout Inventory (Demerouti, Bakker, Vardakou and Kantas, 2003)	16	4 point Likert type Self report	Disengagement Exhaustion
Copenhagen Burnout Inventory (Kristensen, 2005)	19	5 point Likert type Self report	Personal burnout Work-related burnout Client-related burnout
Shirom-Melamed Burnout Measure (Melamed et al., 2006)	14	7 point Likert type Self report	Emotional exhaustion Chronic fatigue Cognitive weariness
The Physician Burnout Questionnaire (Moreno, Jiménez B. et al., 2012)	72	4 point Likert type Self report	Physician Burnout Syndrome Physician Burnout Antecedents Physician Burnout Consequences Positive Personal Resources
Professional Fulfillment Index (Mickey Trockel et al., 2018)	16	5 point Likert type Self report	WorkExhaustion Professional Fulfillment Interpersonal Disengagement
Burnout Assessment Tool (Wilmar B. Schaufeli et al., 2020)	33	5 point Likert type Self report	**Primary dimensions;** Exhaustion Mental Distance Cognitive impairment Emotional impairment **Secondary dimensions;** Depressed mood Psychological complaints Psychosomatic complaints

on active duty were also interviewed. A draft form with 81 items predicted to be behavioral indicators for physicians' burnouts was generated with the findings that were obtained in this manner. The draft form was examined by 1 expert in the field of measurement and evaluation, 3 experts in the field of basic medical sciences, 3 experts in the field of surgical medical sciences, and 4 experts in the field of internal medical sciences. As a result of the examinations, items that were found to be unsuitable for the research were removed from the form and a trial scale form was created with the remaining 74 items. 5 items in the trial form were scored in reverse.

Each item in the form was scored with a 6-point Likert type grading scale. One point indicates that the physician "never experienced the situation expressed in the item and absolutely disagreed with the statement" while 6 points show that the physician "experienced the situation expressed in the item frequently and absolutely agreed with the statement".

Statistical Analysis

The data obtained were first transferred to the computer environment and quality control was carried out for all variables in order to detect and eliminate

possible data entries with errors. In the next step, the reverse scoring process was performed for the items containing negative expressions for each subscale, and outliers analysis was conducted. Following the univariate/multivariate outliers analysis, the data of 20 participants in total were found to be outliers and it was decided to exclude these people from the analysis. Analyses were carried out on the data obtained from the remaining 459 participants.

Pearson correlation coefficient was used to examine the relationship between the item-total scores in item analyses of the scale. After the analysis, items that had 0.20 or less correlations with the total score were removed from the draft form (18,19).

The construct validity of the scales was examined using exploratory factor analysis (Alpha Factoring). Bartlett test and Kaiser-Meyer-Olkin (KMO) test results were taken into consideration for the suitability of the data for factor analysis (19). Before performing the Exploratory Factor Analysis (EFA), the basic assumptions in multivariate statistics (missing data, outliers, normality, multicollinearity) were tested and the data was made ready for analysis (20). For construct validity in data analysis; exploratory factor analysis, confirmatory factor analysis were used as additional evidence to determine the structure. Horn parallel analysis was used to decide the number of factors in EFA.

The reliability of the scales was examined with the Cronbach Alpha reliability coefficient and composite reliability coefficient. Since the item-scale correlations and alpha coefficient obtained during the analyses were found to be high, it was decided to perform promax rotation (Kappa: 4), one of the oblique rotation methods (17,21,22). Factors with eigenvalues greater than 1.00 were processed, the lower limit of the item factor load was determined as 0.32, and attention was paid to ensure that the difference between the load values of items that load more than one factor was at least 0.10 (18-20).

A confirmatory factor analysis (CFA) was conducted on data obtained from a different sample of 156 individuals to provide additional evidence for the validity of the developed scale. Chi-Square/df, Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Normed Fit Index (NFI), Non-normed Fit Index (NNFI), Root Mean Square Residual (RMR) values were examined to evaluate the validity of the model in CFA (17,78). Kurtosis and skewness values calculated over the distribution for the total score obtained from the scale were found to be 0.181 and 0.788, respectively. Therefore, the distribution for the scale total score was accepted as normal (23).

Results

The item analysis study based on the correlation between item-total scale scores showed that item-total correlations varied between 0.399 and 0.844 and there were no items that existed with correlations below 0.20 with the scale total score.

KMO value calculated to determine whether the data obtained from the scale trial form with 74 items were suitable for factor analysis was found to be 0.944, and the chi-square statistic calculated using the Barlett test was found to be significant (chi-square = 20381.76, $p < 0.01$). As a result of these two findings, it was concluded that the data set was suitable for factor analysis. Items with an eigenvalue less than 1.00, items and factors with item factor load less than 0.32, and items that load more than one factor at the same time were removed from the scale. Table 2 presents the factor analysis results obtained from the remaining 45 items. Figure 1 demonstrates the scree plot for eigenvalues. Table 2 and Figure 1 show that the developed scale consisted of five factors. Table 3 presents the correlations between factors. These factors explained 68.15% of the total variance. The variance rate explained by each factor was 50.86%; 5.62%; 4.92%; 3.68% and 3.06%, respectively. The eigenvalues calculated for each factor were 22.89, 2.53, 2.22, 1.66, and 1.38, respectively. Based on Table 2 and the items in the factors; it was thought to be appropriate to name the factors as “affective burnout”, “remorse”, “weariness”, “apathy” and “physiological burnout” respectively (24). The lowest score that can be obtained from the 45 item scale is 45, and the highest score is 270.

Confirmatory factor analysis (CFA) was conducted on the data obtained from different individuals in order to provide evidence for the validity of the structure determined as a result of EFA. Figure

Table 2. Physicians' burnout scale factor analysis results

No	Items	Communality	Item Total Correlation	Factor Loadings				
				1	2	3	4	5
69	I always feel nervous	.825	.782**	.993				
71	I get angry easily	.678	.590**	.951				
73	I'm having trouble concentrating	.628	.636**	.940				
68	I can't stand anything anymore	.783	.791**	.868				
66	I feel worthless	.753	.767**	.849				
62	I am now fed up with life.	.735	.806**	.741				
56	I think this job is making me depressed	.765	.826**	.734				
61	I feel like I'm losing my self-respect.	.662	.760**	.690				
64	I'm tired of everything	.723	.802**	.656				
38	I always feel stressed	.660	.728**	.648				
67	Recently, I have been experiencing occupational 'surmenage' (mental fatigue, exhaustion).	.727	.776**	.627				
63	I can't find time to rest even at home because of being a physician	.575	.699**	.597				
37	I think I get angry more easily about everything	.555	.685**	.577				
58	I feel worthless	.573	.721**	.521				
49	I realize that I cannot think clearly at work.	.665	.744**	.519				
43	I feel desperate	.748	.846**	.485				
18	My whole life has been wasted because of being a physician	.750	.707**		1.00			
17	I wish I had never chosen being a physician	.656	.637**		1.00			
14	If I get a chance, I wouldn't stay here for another 5 minutes.	.651	.687**		.864			
19	I feel like I've come to the end of the road.	.641	.696**		.796			
44	I don't want to work in this job anymore	.713	.786**		.718			
32	I feel cold to being a physicain	.734	.788**		.670			
15	I can't stand this job one more day.	.741	.805**		.658			
31	I don't know how much longer I can take this job.	.696	.787**		.621			

Table 2 (*Continued*)

Table 2. Physicians' burnout scale factor analysis results

11	My job doesn't matter to me anymore.	.647	.762**		.600			
27	I feel I run out of energy to do this job	.745	.827**		.582			
6	I can no longer bear with the workload of medicine anymore	.692	.778**		.578			
10	It feels like I've fallen into a swamp, and the more I struggle, the more I sink.	.763	.844**		.566			
9	I feel so exhausted that I can't do anything	.690	.789**		.556			
12	Even when I am very tired and exhausted, it is killing me when anyone expects high performance from me	.749	.720**			.897		
5	I'm tired of explaining things to people	.713	.695**			.815		
13	Sometimes I have to shout, "I'm a human, too."	.682	.692**			.804		
20	Dealing with patients is very backbreaking	.570	.614**			.736		
24	I'm tired of trying to defend my rights	.534	.610**			.693		
28	I'm glad that day is over on my way home from work	.504	.629**			.617		
22	I no longer care what happens to patients	.688	.515**				.874	
21	I feel like patients aren't human anymore	.718	.630**				.776	
34	I find that I treat patients as if they were not human	.713	.625**				.755	
47	I don't even want to see the faces of the patients	.767	.703**				.731	
74	I no longer care what patients think	.620	.587**				.706	
40	I can't stand seeing patients anymore	.738	.790**				.516	
54	I am suffering from occupational conversion disorder	.770	.541**					.890
53	Being a physician causes me to have a tic disorder	.620	.399**					.851
57	I have been experiencing 'bruxism' lately because of this job	.513	.510**					.635
42	I get heartburn/nausea whenever I go to work.	.597	.665**					.489

*Significant at *0.05, Significant at **0.01*

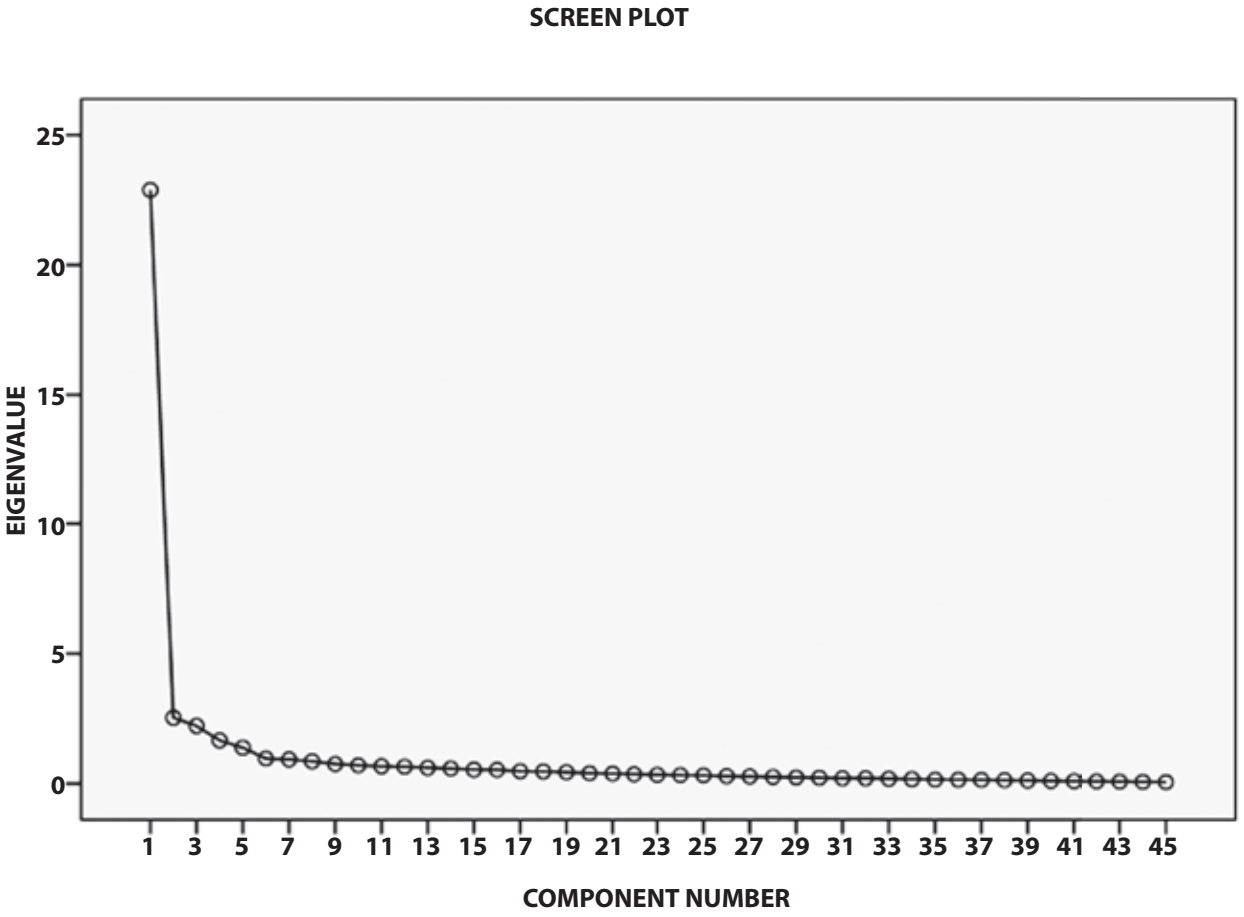

Figure 1. Scree Plot

Table 3. Correlations between factors

	F1	F2	F3	F4	F5	Total
F1	1.000	.764*	.714*	.672*	.683*	.929*
F2	.764*	1.000	.786*	.676*	.562*	.914*
F3	.714*	.786*	1.000	.625*	.546*	.841*
F4	.672*	.676*	.625*	1.000	.540*	.841*
F5	.683*	.562*	.546*	.540*	1.000	.841*

*Correlation is significant at the 0.01 level 2-tailed.

2 presents path diagrams of the tested measurement model. Fit indices calculated by confirmatory factor analysis were as follows: RMSEA = 0.08; CFI = 0.96; NFI: 0.95; NNFI: 0.96; RMR = 0.062. These values show that model fit was achieved. Chi-square = 4562.8 (sd = 935) was observed to be significant ($p < 0.01$) and it was calculated as chi-square/df = 4.88. In the literature, the chi-square/df ratios below 5; RMSEA and RMR values below 0.08, and CF, NFI, and NNFI values higher than 0.95 are accepted as fit indicators (17,18). Hence, it can be argued that the model has an acceptable goodness of fit.

Alpha reliability of the whole scale was calculated as 0.98. The alpha reliability values obtained for the factors were found to be 0.96; 0.96; 0.88; 0.91 and 0.77. In addition, the composite reliability coefficient calculated with the values obtained from the confirmatory factor analysis was found to be 0.86.

Discussion and Conclusion

Burnout is an important problem that negatively affects the lives of individuals in every aspect and may lead to suicide in the future. For this reason, each study

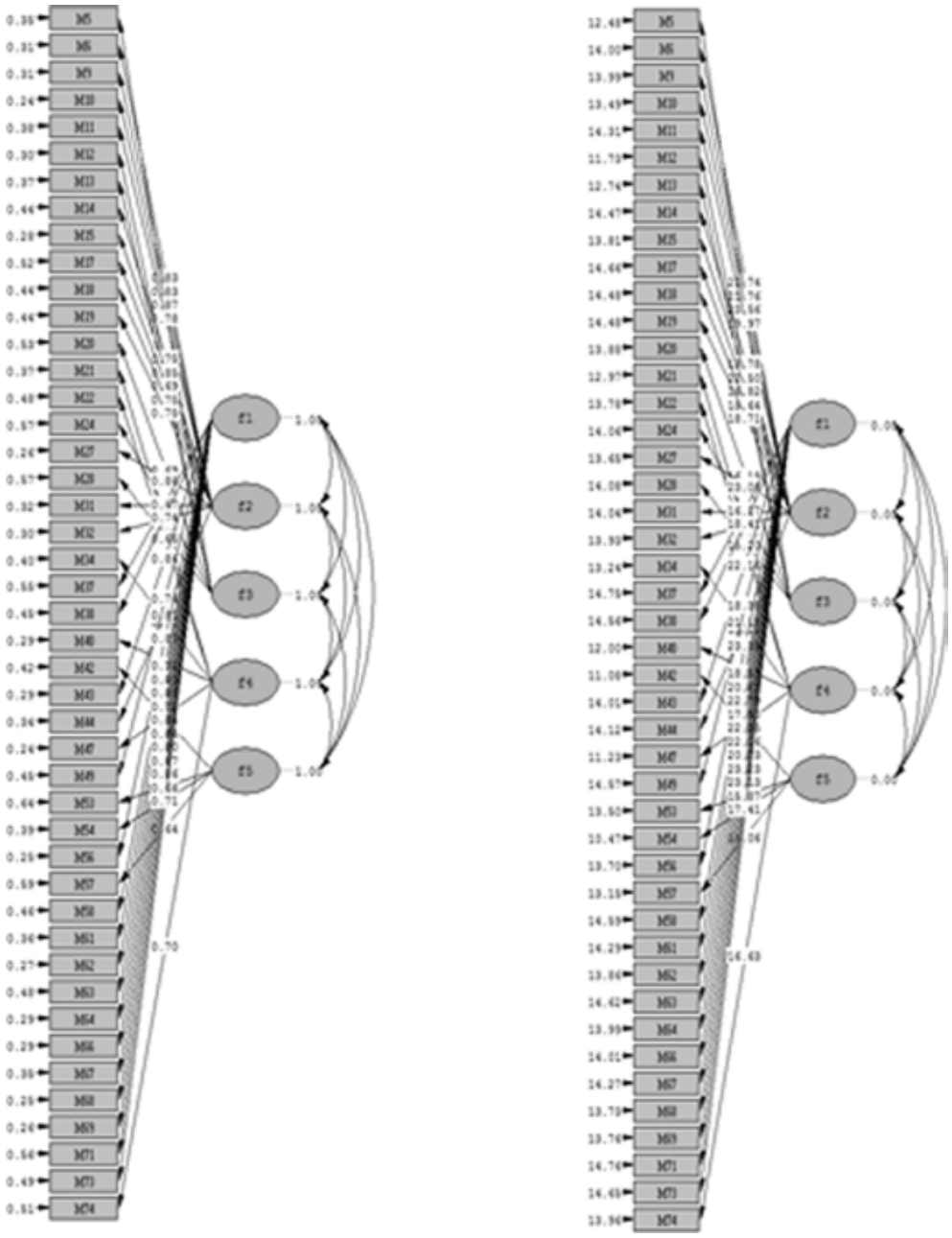

Figure 2. Path diagrams of the tested measurement model, standardized loads, and t values for the scale

carried out to identify the existence of burnout, reveal its causes and help take necessary precautions is significant on its own.

One of the fields where burnout is most common is medicine and physicians are among the professional groups in which burnout is experienced significantly. The burnout experienced by physicians poses a direct and indirect risk to the health and life of the patients as well as the physicians themselves (25-27).

Within the scope of this study, a measurement tool was developed that can measure the burnout levels of physicians reliably and validly measures and can produce accurate results in determining and revealing the causes of burnout.

Based on the findings obtained within the scope of the study, the developed scale explained 68.15% of the total variance with 5 factors and 45 items. Tabachnick and Fidel (2001) stated that it is important for developed scales to explain 2/3 of the total variance (67%), but it is difficult to reach this value in scale development studies (20). The value of 68.15% reached above the value stated by Tabachnick and Fidel (2001). Therefore, it can be concluded that the developed scale ensures valid measurements.

Maslach Burnout Inventory, which was developed by Maslach and Jackson (1981) to measure burnout, consists of a total of 22 items and explained burnout with 3 factors: 'Emotional exhaustion', 'Depersonalization' and 'Lack of personal accomplishment'. The scale developed in this study, on the other hand, consists of 45 items and explains burnout with 5 factors: "affective burnout", "remorse", "weariness", "apathy" and "physiological burnout". The 'Emotional exhaustion' and 'Depersonalization' factors in the Maslach Burnout Inventory are similar to the 'affective burnout', "weariness", and "apathy" factors of the scale developed in this study. However, "remorse" and 'physiological burnout' factors are not included in the Maslach Burnout Inventory. For many situations, the "remorse" factor may not be included in burnout. However, this is not the case for physicians. The profession of medicine is a profession that requires a lot of hard work and dedication in the acquisition of medical school, in the education process, and the profession of medicine. During the interviews with the physicians during the preparation of the scale items, it was observed that the physicians wished they had chosen a different profession in the past. In addition, Justice, Gold, and Klein (1981) mention that burnout has symptoms such as feeling tired, sleep disturbances, headache, digestive problems, palpitations, weight loss, shortness of breath, concentration disorders, and frequent illness. Maslach Burnout Inventory falls short of revealing these indicators. In the developed scale, these indicators are explained by the factor of 'physiological burnout'.

The reliability value of the scale was calculated as 0.98. Reliability values calculated in the context of internal consistency were between 0.00 and 1.00. Kline (2005) states that reliability values calculated at 0.80 and above produce measurements with high reliability (18). The scale developed within the scope of the study offers reliable and valid values. These values are valid in the language and culture in which the scale was developed and for the professional group for which it is intended.

For the scale to be used in a different language or culture, it is necessary to adapt the scale to the language and culture in which it will be used and to verify the reliability and validity values and factor structure in that language and culture. It may be suggested to re-examine the reliability and validity of the scale at certain time intervals and to adapt it to different languages and cultures.

Conflict of Interest: There is no conflict of interest among the authors.

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Correspondence
Turhan Toros
Department of Sports Sciences, Mersin University, Mersin
E-mail: turhantoros@outlook.com