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Development of Burnout Scale for Medical Students

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ABSTRACT

*Current study was designed to develop an indigenous scale of burnout for medical students in Urdu language. Total 67 items were generated on the basis of deductive approach by following literature and Maslach's Burnout Theory (1981). Five experts in the panel, reviewed the generated items and after expert evaluation, 66 items were administered in pilot testing. For pilot testing 50 medical students (25 males & 25 females) were selected from government and private medical colleges of Gujrat and Sialkot, Punjab, Pakistan. Exploratory and confirmatory factor analysis were used for finding the final scale structure. Exploratory factor analysis (n = 250) revealed 64 items with eight factors. The structure maintained through EFA has been confirmed using the confirmatory factor analysis (n = 250). The model showed an acceptable fit (Chi-square = 263.618, df = 123, CMIN/DF = 2.143, CFI = .961, RMSEA = .068 and GFI = .903) and yielded 19 items scale with Cronbach alpha of .903. Results revealed good test re-test reliability (.909**, p < .01), convergent validity (.904**, p < .01) and divergent validity (-.459**, p < .01). It is concluded that newly developed scale provides a valid and reliable assessment of burnout in medical students and also has implications in educational, training and counseling fields.*

Introduction

Medical students have higher chances to develop burnout during preclinical training because they are subjected to a variety of academic and psychosocial stressors, such as a demanding workload, peer competition, and high academic achievement standards (Xie et al., 2019). Additionally, research indicates that medical students are more likely to experience mental health problems than the counterparts in other academic fields since the demanding nature of medical school frequently draws people who might have become psychologically weak (Tee & Kuan, 2021). According to Shrestha et al. (2021), medical students experience more psychological and mental health issues

than students from other disciplines because of the various stressors that they face during their academic years. Approximately 80% of these stressors are caused by the competitive environment of the medical field, and they can lead to academic burnout in medical students. If this burnout persists into residency or afterwards, it can have serious consequences, including decreased quality of life, loss of motivation, academic failure, lower work satisfaction, depression, anxiety, sleep disturbances, exhaustion, substance abuse, as well as suicidal thoughts (Kilic et al., 2021; Lee et al., 2017). Burnout may result from the particular stressors faced by medical students, such as a demanding academic schedule, emotional demands, and a lack of support (Adesola et al., 2025). In addition to impairing medical students' learning capabilities, burnout syndrome can result in physical, mental, and social risks such as exhaustion, drowsiness, eating disorders, migraines, emotional instability, and, in severe cases, drug usage (Boni et al., 2018). Burnout can be defined as a combination of both physical and mental exhaustion, which is frequently becomes worse by work-related demands (Khosravi, 2021; Khosravi et al., 2020).

Higher the level of burnout leads towards high emotional exhaustion and inadequate personal achievement. Professionals in the medical field, such as nurses, physicians, and medical students, frequently experience burnout since they must provide care and have close relationships with other individuals, frequently putting the needs of others before their own health (Nkabinde et al., 2022). Medical students in clinical years who live with their families, spend time on using the social media, struggle financially, and exhibit lower resilience are associated with a marginally higher burnout score. Studies reveal that burnout prevalence ranging from 14.9 to 57.7% among medical students, with contributing factors including prolonged academic demands, stress, lack of control, and insufficient support systems (Baqai et al., 2024). For instance, medical students who are just beginning their studies or have exceptionally high GPAs are more likely to experience burnout (Haile et al., 2019; Irshad et al., 2022; Alsharif et al., 2023; Vidhukumar et al., 2020). According to Shadid et al. (2020), students who did not participate in other extracurricular activities and those with low GPAs both showed higher levels of overall burnout. In the context of Pakistan, 77% of medical students reported sleep deprivation, which influenced a high degree of stress and burnout. In Pakistan, burnout among medical students is significantly correlated with lack of support, little leisure time, and a fear of significant failures or adverse effects and uncertainty about future (Waqas et al., 2015). Researchers examined that students who are studying in fourth and fifth year of medical education had greater level of emotional exhaustion than junior students of medical education (Baqai et al., 2024). Burnout among female medical students is more common because of greater impact of perceived stressors as compared to male students (Muzaffar et al., 2015).

Need of the Scale

Based on previous literature, few scales were already developed on burnout across the world such as the Oldenburg Burnout Inventory (OLBI), which is psychometric tool which is used to assess burnout levels among adults who are working in different occupational settings. To measure the risk factors and core symptoms of burnout such as feelings of exhaustion, cognitive and psychological deficits as well, Burnout Assessment Tool (BAT) is used. It is helpful for healthcare professionals for assessing the level of burnout clearly among employees who are suffering from severe clinical burnout, psychological distress and depression (Schaufeli et al., 2020, 2023). Kristensen et al. (2005) developed the Copenhagen Burnout Inventory (CBI) and mainly focused on fatigue and exhaustion. CBI is a non-commercial, free, and easy-to-administer. Maslach Burnout Inventory (MBI) contains 22 items questionnaire which was introduced in 1981 and used to measure the burnout levels severity in professionals (Maslach & Jackson, 1981). This scale is used mostly for assessing of burnout levels by following three dimensions such as emotional

weariness, depersonalization and reduced or diminished individual accomplishment (Schaufeli & Enzmann, 1998).

Only two scales on burnout developed in Pakistan according to cultural context. One is recently developed that is Burnout Scale for Adults (BSA), 22 items developed to assess burnout levels among adults (Tanveer et al., 2023). Second, Emotional Burnout Scale (EBS) for teachers contained 31 items is used to measure burnout among teachers for measuring the severity of their emotional states due to work (Shaheen & Mahmood, 2018). Thus, the purpose of this study work is to close the gap. The purpose of this scale is to develop a reliable and valid an indigenous burnout assessment tool for medical students, relevant to culture and native language to study burnout among medical students in Pakistani culture. Items of the tools are formulated on Maslach Burnout Theory (Maslach & Jackson, 1981) and literature by using deductive approach. There is no any culturally relevant and validated tool on burnout for medical students in Pakistan. All the existing scales are developed in a foreign language and older which can create difficulty in understanding and misinterpretation in capturing the psychological constructs and cannot be able to measure currently culturally relevant issues because scales developed in western contexts cannot be able to measure constructs in Pakistani contexts such financially issues, high expectations of parents or family.

Theoretical Model of Burnout

Maslach and Leiter (2016) stated that burnout is basically a psychiatrist syndrome which emerges as an ongoing reaction to continuous interpretation challenges during work. There is no any uniform agreement about burnout symptoms. Maslach's idea was first proposed in 1981 and is commonly used to monitor employees' emotional well-being. Burnout is a growing problem in medical education and recent research suggests that burnout in medicine is mostly induced by workplace conditions, necessitating organizational-level solutions. Burnout is also affected by perceived reasons, cause various factors and the link between burnout and spiritual crisis. Maslach's Burnout Theory defines burnout as the emotional weariness, depersonalization and reduced or diminished individual's accomplishment. These are as follows:

Emotional Exhaustion

Emotional weariness or exhaustion is one of the main causes of burnout. It is characterized by symptoms including mental exhaustion, loss of energy, and trouble regaining energy, which are typically due to work-related factors (Maslach et al., 2001).

Depersonalization

American Psychological Association defined that depersonalization is a mental state in which the self seems unreal. People have a detached, dreamy quality to their thoughts and feelings, and they feel cut off from both themselves and the outside world. It frequently results from worry, despair, stress, or trauma.

Reduced Personal Accomplishment

Decreased personal achievement is seen as a sense of failure in one's professional performance and a negative self-evaluation. According to a number of studies, burnout has a detrimental effect on workers' performance, job satisfaction as well as their health both psychological and physical (Khodadoost et al., 2023).

Objectives of the Study

The objectives of the study are to:

1. Develop an indigenous scale of burnout for medical students in Pakistani cultural context.
2. Determine the psychometric properties of an indigenously developed burnout scale for medical students.

Method

Development of an Indigenous Burnout Scale for Medical Students (BSMS)

According to cultural perspective of Pakistan, a burnout scale for medical students was developed in three steps by using a deductive approach. In the first step, items were generated by following Maslach's Burnout Theory (1981) and literature review. In the second step, evaluation of generated items was conducted from the experts. In the third step, a pilot study was conducted.

Step-I Generation of Item Pool

Item pool was generated, following the deductive approach. Literature and Maslach's Burnout Theory (1981) was followed and utilized to generate items. Total 67 items were generated as the primary item pool and listed in the initial form. Cultural aspect was followed by using Urdu language.

Step-II Content Validity through Expert Evaluation

After generation of item pool, the next step was to check the item pool's content by the experts. For determining the item's content validity, total 67 items were enlisted from initial from of BSMS, was presented to a panel of five experts including 3 PhD and 2 PhD scholars who have expertise in field for establishing the validity of content. The basic purpose of expert evaluation was to get the expert's opinion about the contents of each item either it is clearly measuring the burnout among medical students. Through expert's reviewing, each item's suitability was assessed by following Lawshe's Model (1975) which includes 3 is essential, 2 is useful but not essential and 1 is not necessary. The Content Validity Ratio was computed manually using formula of Cohen net al. (2010):

$$CVR = ne – (N/2)/N/2$$

Where, be is CVR is the Content Validity Ratio, ne is the total number of experts are divided by the number of experts agreeing on essential items and N = total number of experts.

Experts stated that most items were appropriate and well aligned to the defined domains. Only 1 item was removed due to much similar constructs. According to the recommendations of experts, minor modifications have been made to the items' wording and phrasing.

Table 1

Content Validity Ratio of Items

No. of Items	Items	Ranges (From 1-4)	Rating Categories
49	1,2,3,4,6,9,10,11,13,14,16,17,18,21,22, 23,24,25,26,27,29,30,32,33,34,36,38,39, 40,41,42,43,44,46,47,48,49,50,51,52,54, 56,57,58,60,61,63,65,67	0.80 -1.00	Excellent
17	5,7,8,12,15,19,20,28,31,37,45,53,55,59, 62,64,66	0.63 -0.79	Good
	_	0.49 -0.62	Fair
1	35	0.00 -0.48	Poor

Table 1 revealed that the validity of content of 67 items were evaluated by five experts of subject. The original burnout scale for medical students was maintained with the remaining 66 items which was further used in pilot testing.

Step-III Pilot Study

A pilot study was conducted on medical students. Sample of 50 medical students (25 males & 25 females) was recruited through multistage stratified sampling technique from government and private medical colleges of Gujrat and Sialkot in Punjab (age ranging 18 to 28 years). Total 66 items were enlisted in initial, then administered on the participants to evaluate comprehension, understanding levels of initial items list and words appropriateness for the target population. Participants were approached in their classes at medical colleges after taking permission from teachers and receiving approval from the college's administrators. Participants were briefed in Urdu language about the goals of the pilot study, they were requested to complete given forms as per their emotions, attitudes or thoughts towards medical education. After taking their consent, initial form of burnout scale for students was administered on them. Their identity was kept confidential. Students with any psychological and physical illnesses or issues were excluded. If the Cronbach's alpha is greater than 0.9, the scale's reliability is at an excellent level. As a result, the results from the pilot study showed that it is trustworthy and highly reliable for testing, and the study's set of questions should be maintained. The value of Cronbach's alpha in the pilot research was .958, showed excellent internal reliability (Gliem & Gliem, 2003).

Step-IV Exploratory Factor Analysis

In phase-II, pilot tested initial form of BSMS containing 67 items, was administered on 1100 participants to determine the psychometric properties such as EFA, CFA and internal consistencies. To investigate the current burnout scale's structure, the initial form of burnout was given to medical students. Total 250 participants were selected for the field administration. Researcher performed exploratory, confirmatory factor analysis, and internal consistency of scores. Prior to EFA, each item's total correlation was determined, and the items with the lowest correlation were listed below. 4 were removed by following Field (2013) who recommended that suppressing factor loadings less than 0.3 and scores .4 or greater than 0.4 be regarded as stable. Remaining 64 items with correlation .4 or greater were finalized for EFA.

Identifying the number of factors and components for each concept and assessing the internal reliability of the elements are the goals of exploratory factor analysis. EFA has been directed to reveal the underlying BSMS factors using SPSS 24 version. The KMO value was also examined.

Sample

Total 250 (125 males & 125 females) medical students age ranging from 18 to 28 years who were enrolled in medical colleges from 1st year to 5th year of MBBS were chosen. According to Indrayan (2019), multi-stage sampling is a technique which is used to make primary data collection easier by dividing the larger population into smaller clusters in different stages. In stage-1, the sample was divided into private and government medical colleges. In stage-2, each stratum was divided into 5 years of medical education and in stage-3, each stratum was further divided into substrata of both male and female medical students. Students who are suffering from any physical or psychological illness were not included in the sample.

Measure

Measure is divided into two categories for administration and initial enlisted items of Burnout Scale for Medical Students were used.

Demographic Sheet

A demographic information form was prepared to collect information about, age, gender, year of education, residential area, type of institute, living arrangements and family system were included. Important and identifiable details about study findings participants were gathered using the demographic sheet. It allowed by researcher to obtain basic introductory information about the participants. Participants' information was gathered through the following tool.

Initial Enlisted Items of Burnout Scale for Medical Students

Initial list of BSMS was administered on medical students during their schedule classes in the form of groups after taking permission from administration and teachers. The items were scored from strongly disagree (1) to strongly agree (5) on a 5 point Likert scale.

Procedure

After getting permission from medical colleges' heads/principals and teachers, the participants were approached in their classes. After a brief introduction, the main objectives of the research were described to them. After taking the written consent, initial list of BSMS was administered. They were requested to complete given forms as per their emotions, attitudes or thoughts towards medical education. On average, it took 10-15 minutes to complete the initial form of BSMS. The ethical standards of informed consent and confidentiality were maintained. Additionally, respondents were made aware of their freedom to leave the research at any moment. Respondents were also not forced to disclose their identity rather they are assigned ID numbers.

Results

Both frequencies and percentages of different variables were attained. The factors of the newly established scale were discovered by exploratory factor analysis. Both descriptive statistics of demographics and EFA results are given following:

Total 125 males as well as 125 females who participated in the study were involved. Most of the students fell in the age of 24 years (26.0%). Majority of the students were in the 5th year (31.2%). Most of the students were hostelite (66.4%) and unmarried (99.2%). Majority of the participants were living in a nuclear family system (77.2%) and living in urban areas (56.4%). Before explanatory factor analysis, sample adequacy test was also run.

Kaiser-Meyer-Olkin test assesses acceptability of data for the factor analysis by measuring sample adequacy. Stated differently, it assesses the presence of a sufficient amount of robust factor structure. KMO value was .928. The range of values for the KMO test is 0 to 1 (Surucu et al., 2022). Kaiser (1974) introduced the criteria for evaluating the value of KMO and showed that a KMO rating above .90 is considered amazing and has a significant level of appropriateness. Bartlett's test of sphericity revealed an X^2 value of 19233.196 ($p < .001$), indicating that the R-matrix is factorable and that the BSMS data set is appropriate using exploratory factor analysis.

Table 2

Factor loading of 64 Items on Burnout Scale for Medical Students (N= 250)

Sr. No.	Item No.	Factors							
		F1	F2	F3	F4	F5	F6	F7	F8
1	9	.888							
2	5	.884							
3	26	.882							
4	20	.875							
5	17	.870							
6	1	.866							
7	13	.865							
8	12	.864							
9	4	.847							
10	24	.847							
11	21	.843							
12	15	.838							
13	16	.834							
14	10	.818							
15	18	.817							
16	19	.809							
17	3	.802							
18	2	.800							
19	25	.793							
20	62	.744							
21	11	.738							
22	23	.708							
23	7	.579							
24	6	.533							
25	49		.869						
26	50		.863						
27	45		.857						
28	46		.843						
29	48		.830						

30	47	.830						
31	51	.820						
32	54	.788						
33	38	.635						
34	42		.833					
35	40		.826					
36	43		.803					
37	28		.802					
38	30		.785					
39	33		.769					
40	22		.761					
41	44		.759					
42	39		.756					
43	32		.751					
44	56			.882				
45	58			.875				
46	57			.865				
47	61			.843				
48	60			.793				
49	63			.747				
50	64			-.722				
51	14			.671				
52	29				.827			
53	27				.778			
54	31				.762			
55	35				.705			
56	36				-.629			
57	59				.600			
58	52					.858		
59	53					.848		
60	55					.808		
61	8						.692	
62	37						.669	
63	41				.530			.668
64	34				.604			.612

Table 2 indicated that most of the items represent factor loading levels ranging from.5 to.9. Principal Component Analysis (PCA) was utilized to assess the factors structure in items after EFA was run with Varimax rotation. According to the Kaiser-Gutzman criterion, an initial analysis with an Eigen value >1.00 produced an 8-factor solution that accounted for 2.44 percent of the variation. Moreover, the scree plot showed factor solution with a distinct break after the eighth component. Eight distinct factors were identified after factor loading with theoretical relevance. 64 BSMS items surfaced after EFA because no things were removed. Items were selected based on high loadings. Some of the items have dual loading, but this is to be expected as the scale was measuring the single construct. Moreover, item no 6 and 7 had high factor loading in factor no 1 but both had theoretical relevance with factor 7 so both were placed in factor 7. On the other hand, item no 38 had high factor loading with factor 2 but it had theoretical relevance with factor 3 so it had placed in factor 3. Lastly, item no 14 also had high factor loading in factor 4 but it had theoretical relevance with factor 1 so it had placed in factor 1. The researcher identified eight

factors based on a thematic comprehension of the material included in each factor: Factor 1 labeled as Emotional Exhaustion, Factor 2 as Lost Self-efficacy, Factor 3 as Irritability or Negativism, Factor 4 as Lack of Focus or Concentration, Factor 5 as Cynicism and Resentful, Factor 6 as Lack of Openness to New Ideas, Factor 7 as Dissatisfaction and the last Factor 8 as Social Pressure.

Scree Plot

Figure-1.1: Scree Plot Indicating Factors Solution

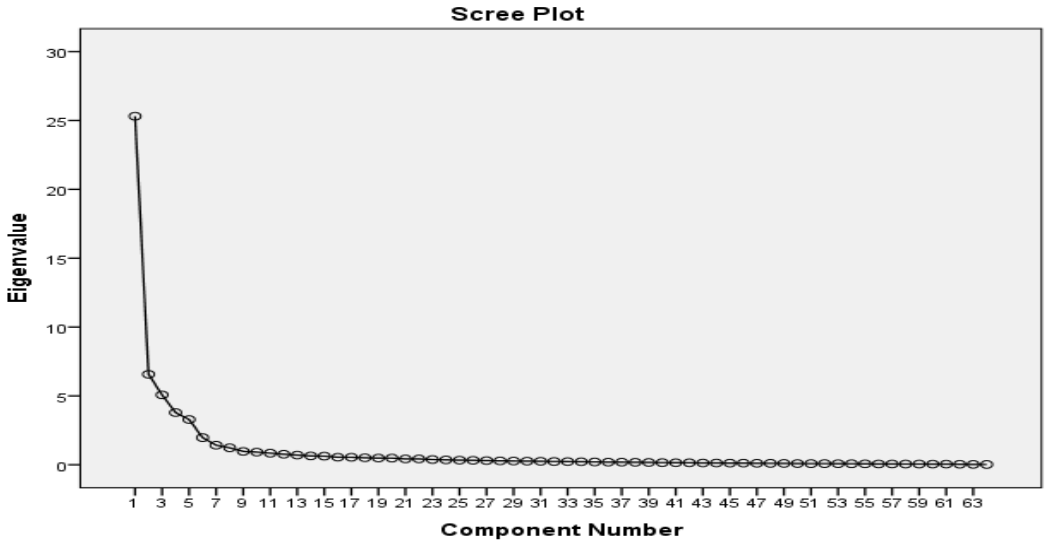


Figure 1.1 indicates the scree plot which represents the factor solution with a clear break after 7th component, suggesting that factor solution with eight factors was optimal based on factor loadings and theoretical relevance.

Step-V Confirmatory Factor Analysis

Stevens (2012) suggests that it is valuable to use CFA to support the associations between things and their associated fields. In addition to offering metrics to assess how effectively the gathered data fits suggested theoretical model, this enables modification of the associations in the model. Applying 64 items for model measurement, factor structure, and dimensionality identification of the Burnout Scale for Medical Students, CFA was conducted on a data set of 250 participants following EFA, which retained eight factors (AMOS version 24).

Sample

A sample for CFA, 250 respondents (125 males & 125 females) medical students age ranging from 18 to 28 years who were enrolled in medical colleges from 1st year to 5th year of MBBS were chosen through sampling technique of multistage stratified from both government as well as private medical colleges (Nawaz Shareef Medical College, Khawaja Muhammad Safdar Medical College and Islam Medical and Dental College), Punjab. The inclusion and exclusion criteria were similar to those for the EFA data set.

Most of the students fell in the age of 24 (29.6%). Most of the students were belonged to 5th year (26.8%). Mostly participants were living in hostels (62.8%) and were unmarried (99.6%). Majority

of the participants were belonging to nuclear family system (76.4%) and living in urban areas (58.4%). Most of the medical students were unmarried (99.6%). The structure did not show an acceptable match to the data, according to the CFA results (Chi-square= 5744.009, CMIN/DF = 2.985, CFI = .794, RMSEA = .080 and GFI = .579) because the CFI value was below the acceptable level of .900.

Since modification indices offer more accurate information on model misfit than expected goodness of fit metrics, they were investigated (Brown, 2006). Additionally, the model was examined again using modification indices in light of the covariance along with regression weights that revealed item repetition 1,2,3,4,6,10,11,12,13,14,15,16,18,19,20 21,22,23,25,26,27,28,30,31,32,33,36,37,38,39,42,44,45,48,50,51,54,55,58,59,60,61,62,63,64 which were eventually removed because of their repetition and troubling status in the model. In order to have a model that fit, covariance was drawn. To assess the model, CFA was performed once more on these 19 items. Ultimately, 19 items were used to corroborate the scale. The model showed that it fit well with (Chi-square= 263.618, CMIN/DF = 2.143, CFI = .961, RMSEA = .068 and GFI = .903). Nineteen items were employed to confirm eight components in the final model.

Table 3

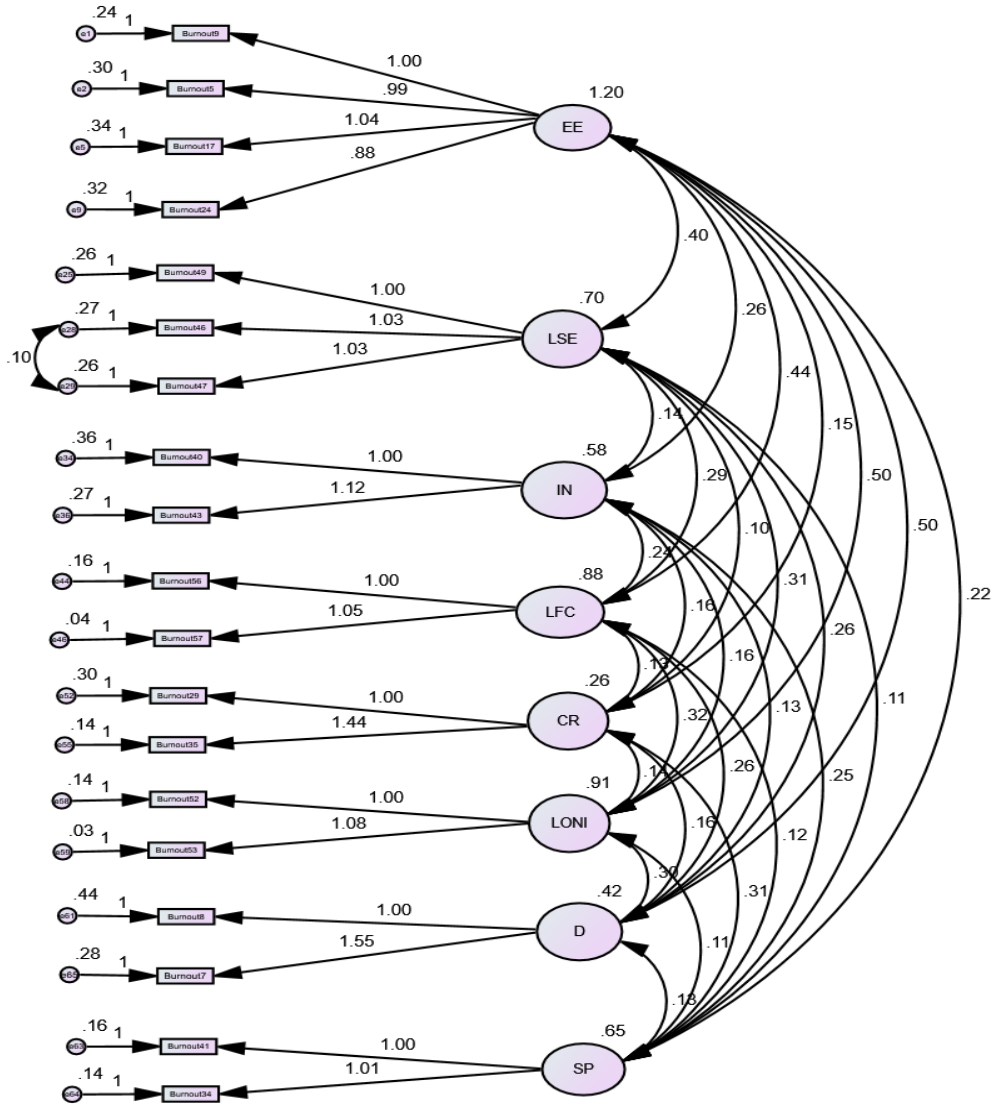
Model Fit Summary of Confirmatory Factor Analysis (N = 250)

Indexes	Chi-square	CMIN/Df	CFI	RMSEA	GFI
Model-1	5744.009	2.985	.794	.089	.579
Model-2	263.618	2.143	.961	.068	.903

Same measures, procedures and ethical standards were used for data collection of CFA as followed for EFA. Table 3 indicated that two models run for confirmation of structure. It further revealed that model-2 indicated a value of CFI is .961 which is in the acceptable limit and indicating a good model fit in comparison of model-1 because a CFI value if equal or greater than 0.95, is regarded as having a high degree of model fit (West et al., 2012). An adequate correspond with is indicated if the CMIN/DF value is less than or equal to 3 (Kline, 1998). Model-2 represents CMIN/DF value that is 2.143 which indicates an acceptable fit value. An excellent correspond to is defined as a GFI value of 0.95 or higher (Kline, 2005) and given value of GFI in table is .961 which indicates an excellent fit value. RMSEA (Root Mean Square Error of Approximation) values between 0.05 and 0.08 which are considered acceptable (MacCallum et al, 1996) and given table indicates .068 value which is considered acceptable.

Figure 1.2 indicates CFA of Burnout Scale for Medical Students along with eight factors. The Cronbach's alpha reliability was .903. According to George and Mallery (2003), if the reliability value is.9 or above, then it is considered an excellent internal consistency.

Figure-1.2: Final Model to Confirm the Factors Structure of Burnout Scale for Medical Students



Psychometric Properties of the newly developed scale

Test-Retest Reliability

Middleton (2025) stated that the scores consistency of same person across two or more different administrations of the same measurement procedure on same population over time. In this study, Burnout Scale for Medical Students was evaluated for test-retest reliability which examined that results are consistent across three weeks intervals (n = 200). Findings indicated that a significant correlation was found (r = .909**, p < .01) between both BSMS administrations on the same sample.

Convergent and Divergent Validity

For evaluation of validity, 400 participants were selected from government and private medical colleges using multistage stratified sampling technique. The age range of respondents were 18-28

years. The correlations between scores on burnout scale for medical students and assessments of related constructs were examined in order to determine convergent validity of the scale. Correlation was estimated by Pearson's correlation coefficient. The criteria for inclusion and exclusion were similar to those employed in the validity assessment of the EFA and CFA. Convergent validity of BSMS was determined by assessing the correlation between Burnout Assessment Tool (BAT) (Schaufeli et al., 2020) scores in Urdu and BSMS scores. Results showed that a positive correlation of .904**, p <.01, is statistically significant between the BSMS and BAT in Urdu versions. The correlation between scores on burnout scale for medical students and assessments of unrelated constructs were examined in order to determine divergent validity of the scale. By analyzing the correlation between BSMS and BRS (Khan & Batool, 2020) scores in Urdu versions, divergent validity of BSMS was demonstrated. Results indicated that the Burnout Scale for Medical Students with the Brief Resilience Scale showed a statistically significant inverse association (r = -.459**, p <.01) in Urdu versions.

Discussion

Following the dire need of measuring the burnout among medical students through an indigenous scale, the current study was designed. Psychosocial stressors are constant source of exposure for students who are getting medical education and academic pressures throughout their studies or training, can result in burnout syndrome if it persists. This study conducted for developing a culturally adapted burnout scale for medical students (BSMS) in Urdu language. Two phases were carried out to develop BSMS. In phase-I, a burnout scale for medical students according to cultural perspective of Pakistan was developed in Urdu language. In phase-II, psychometric properties of Burnout Scale for Medical Students were determined. Findings of the study were discussed as follows:

The first aim of this study was to develop a burnout scale for measuring burnout levels among medical students in the cultural context of Pakistan in Urdu language. In order to have an indigenous perspective, items were generated on the basis of Maslach's Burnout Theory and literature review, focused on three major components related to burnout in which first is emotional exhaustion, second is depersonalization and the third is reduced or diminished personal accomplishment and a comprehensive existing literature was reviewed to identify key concepts within the study domain. After generation of items, total 67 items were listed in initial form. Panel of five experts including 3 PhD and 2 PhD scholars evaluated the items according to Pakistani context. A newly designed BSMS differs from other burnout scales that are currently in use. To evaluate the Burnout Scale for Medical Students, researchers evaluated each item by examining it from the perspective of its content. It consists of 66 items after expert evaluation.

A study by Schaufeli et al. (2020) supported it on the development and validation of Burnout Assessment Tool (BAT) that is a work-related version of the BAT used for working individuals or in working situations. Items were generated based on extensive interviews conducted by experts and analysis of burnout questionnaires. The BAT contains four burnout dimensions: exhaustion, cognitive impairment, emotional impairment, and mental distance. Items were divided into core symptoms and secondary symptoms of burnout and also applied content validity for clarity, comprehensibility of statements and suitability of items according to socio-cultural background of target population. Results showed that test-retest reliability, content validity, and consistency were all strong points of the scale.

Second objective of current study was to establish the psychometric properties of the scale. Results of exploratory factor analysis identified eight factors structure. Keeping in view the item loading

and theoretical relevance of items, eight items were retained for confirmatory factor analysis. The EFA provided the KMO value of .928 and Bartlett's test showed significant results (p<.001). Both the findings were up to the significant limit. The factor loading of the significant items were in between 0.5 to 0.9 whereas, a value above .4 was considered as substantial. In interpreting the rotated factor pattern, an item was said to be loaded onto a given factor if that factor's loading was 0.40 or higher and the other factors' loadings less than 0.40 were removed (UCLA, 2020).

Moreover, eight factors of final scale were finalized by confirmatory factor analysis. Owing to regression weights and repetitions, some of the items were discarded. There are enough items for every factor. The ultimate analysis was confirmed by following CFA. When compared to model-1, the CFI value of .961 was within the acceptable range and showed a good fit because a CFI value if equal or greater than 0.95, is regarded as having an excellent level of model fit (West et al., 2012). Results are consistent with the Schaufeli et al. (2020) study on General Version of Burnout Assessment Tool's development and validation for general population which reported .95 value of CFI. Pilot testing was yielded a Cronbach's alpha of.958, but field administration revealed great internal reliability for the final items of BSMS (.903).

Theoretical relevance of each item indicated that Factor 1 containing four items based on emotional exhaustion, factor 2 representing three factors related to as lost self-efficacy, factor 3 comprised of two items related to irritability or negativism while factor 4 also containing two items and linking to lack of focus or concentration. Factor 5 consists of two items related to cynicism and resentful, factor 6 has also two items on the basis of lack of openness to new ideas, Factor 7 consists of only two items linking to dissatisfaction and the last Factor 8 also containing two items on the basis of social pressure. Findings of the study were aligned with Maslach and Jackson (1981) who proposed Maslach Burnout Inventory (MBI) contained 22 items questionnaire used to measure the burnout levels severity in professionals (Maslach & Jackson, 1981).

Convergent validity of BSMS was determined by exploring the relationship between scores of BSMS in Urdu version and BAT in Urdu version. Findings established the evidence of convergent validity with statistically significant positive correlation (r = .904**, p<.01) between the scores of BSMS and Burnout Assessment Tool (BAT) in Urdu versions, it was noted that students who scored higher in BSMS and also scored higher in BAT.

The divergent validity of the BSMS was confirmed by two hypotheses getting the statistically significant negative correlation. Findings set the evidences of divergent validity of the BSMS by showing statistically insignificant inverse correlation (r = -.459**, p < .01) within Burnout Scale for Medical Students and The Brief Resilience Scale in Urdu versions. It was conducted that students who had higher burnout levels were more likely to experienced lower resilience levels. Findings of the study were aligned with Conte et al. (2001) who discovered that when MBI and Time Urgency Inventory were interrelated, the divergent validity coefficients varied from -.01 to -.40. Both discriminant and convergent validity are important for measuring construct validity (Hubley & Zumbo, 2013). Test-retest reliability was also determined and findings revealed that test-retest reliability of BSMS was .909** (p < .01) by showing a strongly higher correlation along with the gap of three weeks within two BSMS administrations on similar sample.

Strengths and Limitation

The strengths phase-I is that this scale is only indigenous burnout scale which is developed for medical students in Pakistan. The limitation of the present study was conducted in only two cities of Punjab, Pakistan due to which findings cannot be generalized on other cities or provinces of

Pakistan. Although, this scale has good psychometric properties but it is specifically developed only for medical students in Pakistan using Urdu language. It cannot be applied to students of other disciplines or different cultural settings.

Implications

By utilizing this burnout scale, medical colleges can provide early interventions for promoting student's mental health and wellbeing which can be helpful for improving student's academic performance and a more sustainable academic and learning environment. This newly developed tool can be applicable across different medical colleges and also can be utilized by administrators, students, mental health professionals to measure burnout levels. From educational perspective, counseling sessions, trainings, workshops and interventions are required to promote coping mechanisms for reducing the effects of burnout. It can be beneficial to early detection and interventions for burnout even in settings with limited resources.

Conclusion

It is obvious that an indigenous burnout scale was desperately needed for evaluating medical students' levels of burnout, in Pakistan. Newly developed scale can be used in diverse medical colleges to assess the level of burnout among students who are getting medical education. This study provides a valid and reliable tool to assess burnout levels for improving the academic performance and enhancing the well-being of students in medical field. This tool is according to Pakistani cultural context and language for identifying accurately the local stressors that Pakistani students are facing in medical field. It would be helpful for enhancing the academic performance and work satisfaction. It is appropriate in both linguistically and culturally. Hence, it provides an accurate picture of factors that contribute to the burnout that medical students are facing.

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