

Psychometric Properties and Validation of the Arabic Maslach Burnout Inventory-Student Survey in Saudi Dental Students

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Abstract

Background: Few studies have studied burnout among dental students worldwide, and no such study is available from Saudi Arabia. In addition, an Arabic version of the Maslach Burnout Inventory-Student Survey (MBI-SS) has not yet been validated for use among students.

Objectives: This study aimed to translate and validate an Arabic version of the MBI-SS questionnaire and to examine the psychometric properties of burnout among dental college students at a university in Saudi Arabia.

Materials and Methods: This cross-sectional questionnaire study included all dental students at King Khalid University, Saudi Arabia, and was conducted between December 2019 and January 2020. After the MBI-SS questionnaire was translated, its face validity was determined and the test-retest reliability was assessed. Confirmatory factor analysis and reliability analysis were performed following the full-scale study to validate the Arabic MBI-SS.

Results: A total of 433 dental students responded in the full-scale study (mean age: 21.9 ± 1.6 years). Emotional exhaustion was present in 32.3% (95% confidence interval: 28%–36.9%), cynicism in 33.7% (29.3%–38.4%), and poor academic efficacy in 34.2% (29.8%–38.9%) of the dental students. Emotional exhaustion and cynicism were significantly associated with academic level, a history of medication due to academic stress, and thoughts of quitting the course (for all, $P < 0.05$). The reliability of MBI-SS was found to be adequate for all three subscales: Emotional exhaustion, Cronbach's $\alpha = 0.827$; cynicism, $\alpha = 0.855$; academic efficacy, $\alpha = 0.704$.

Conclusions: All three subscales of burnout were highly prevalent in the study cohort. The Arabic version of the MBI-SS inventory was shown to be a valid and reliable tool for assessing the psychometric properties of burnout among dental students, and its use may aid in identifying burnout in the early stages.

Keywords: Arabic, dental students, health-care evaluation, Maslach Burnout Inventory, student burnout, validation

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INTRODUCTION

Chronic stress at workplace coupled with inadequate coping mechanisms can result in burnout or work environment syndrome, which can negatively affect the personal and professional lives of individuals.^[1,2] The physical, social, and mental implications of burnout syndrome on the well-being of individuals make it a public health problem.^[3,4] Burnout syndrome has three main subcategorization: Exhaustion, which is emotional draining resulting in not being able to work; cynicism, which is distancing behaviors toward work, customers, and co-workers; and inefficiency, which is feeling of incompetence/inadequacy in performing a task at work.^[5,6]

In the medical domain, burnout is not only prevalent among doctors and nurses but also among students.^[7-9] Among students, trainees in medicine and nursing are vulnerable groups.^[9,10] Specifically, in dentistry, dental students have been found to experience considerable levels of stress during their academic and clinical aspects of dental training,^[11] which in turn can result in burnout.^[12,13] However, to the best of the authors' knowledge, the overall breadth of evidence regarding burnout among dental students is not sufficient, and no such studies are available from Saudi Arabia.

Several assessment tools are available for measuring burnout. However, Maslach Burnout Inventory (MBI) developed by Maslach and Jackson in 1981 remains the most frequently used standardized tool to evaluate the burnout syndrome.^[6] The 22-item MBI Human Services Survey (HSS) scale has been translated into several languages and validated.^[14-16] The MBI-Student Survey (MBI-SS) is an adaptation of the original MBI scale to make it applicable specifically to students.^[17] The psychometric domains of the student's scale refer to feeling exhausted because of academic stress, cynicism related to one's study, and feeling professionally incompetent as a student. However, to the best of the authors' knowledge, an Arabic version of the MBI-SS questionnaire has not been validated for use among students in Saudi Arabia, which is important because variability in interpretation can result in lower quality data collection. Therefore, to address the current gaps in literature, this study aimed to translate and validate an Arabic version of the MBI-SS questionnaire as well as examine the psychometric properties of burnout among dental college students at a university from Saudi Arabia.

MATERIALS AND METHODS

Study design, setting, and participants

This cross-sectional analytical study was conducted among dental students at King Khalid University (KKU),

Saudi Arabia, from December 01, 2019, to January 31, 2020. Assuming the prevalence of burnout syndrome as 17%,^[18] with an absolute precision of 3.5% at 95% confidence level, the minimum sample size was estimated to be 231 dental students. The sampling frame included all dental undergraduate students attending the College of Dentistry at KKU ($n = 480$). Students in internship and those included in the pilot study were excluded from the main analysis.

The study was conducted after obtaining ethical approval from the Scientific Research Committee at College of Dentistry, KKU. Participants were included only after they provided an informed consent.

Study tool and data collection

A three-part questionnaire in Arabic language was used for this study. The first two parts elicited data regarding sociodemographic characteristics and academic performance, while the third part was the Arabic translated MBI-SS.^[6,17] MBI-SS is a 15-item tool assessed using a 7-point Likert scale, ranging from 0 (never) to 6 (everyday). The instrument has three dimensions: Emotional exhaustion (five items), cynicism (four items), and academic efficacy (six items). The presence of burnout syndrome was determined according to the criteria used by Maslach and Jackson.^[19] Cutoff values for exhaustion and cynicism were individuals above the 66th percentile, while for academic efficacy, it was individuals below the 33rd percentile. The academic performance-based questions elicited data regarding variables such as performance in the course, medication intake due to academic stress, and thoughts of quitting the course. The questionnaire did not collect any identifying information.

Prospective participants were directly approached at the end of lectures and the study purpose was explained. In addition, the students were informed that participation is voluntary, and that the data collected would only be used for this study. A Google Form link was shared through E-mail with those who consented to participate. Participants were provided 20 min to complete the questionnaire, which was estimated to be adequate based on the pilot study, and the investigators were available for any clarifications required. Response to all questions was made mandatory to be considered in the final analysis. No financial incentives were offered for participation in the study.

Questionnaire translation and validity assessment

The questionnaire was forward translated from English to Arabic language by two independent native Arabic speakers (one had a PhD in Arabic language and the other

in Dentistry and both of their academic rank were Full Professor). Then, the Arabic version was back-translated by a professional English language expert who is also an Arabic speaker. No discrepancy was noted in the back-translated and original versions. The native independent Arabic speakers again verified the final translation, but no further changes were deemed necessary.

The face validity of the Arabic version was checked by two authors who are native Arabic speakers. A pilot study was conducted with randomly chosen dental students ($N = 23$) to determine the reliability and feasibility of the questionnaire; for the test–retest reliability, the questionnaire was distributed twice with a 1-week interval. These students were not included in the full-scale study. Cronbach's α was used for assessing the internal consistency: ≥ 0.90 was considered as excellent reliability, ≤ 0.90 – 0.70 as high reliability, ≤ 0.70 – 0.50 as moderate reliability, and ≤ 0.50 as low reliability.^[20]

Statistical analysis

Data were analyzed using STATA version 13 (StataCorp LP, College Station, TX, USA) after checking for completeness and consistency. Continuous variables such as age are presented as mean \pm standard deviation, and categorical variables are presented as frequency/percentage. Comparison of sociodemographic and other variables of interest by each psychometric domain of MBI-SS was performed by Student's t -test and analysis of variance test. The level of significance for decision-making was 5%. The prevalence of psychometric properties was presented as percentage with a 95% Confidence Interval (95% CI). Marco's guidelines were followed in analyzing the psychometric qualities of the MBI-SS.^[21] Confirmatory factor analysis was used to assess the construct's validity and reliability. Chi-square/df, root mean square error of approximation (RMSEA), goodness-of-fit index (GFI), comparative fit index (CFI) were used to assess the model fit. The model was considered valid if: Factorial validity Chi-square/df values ranged between 1 and 2, GFI and CFI values were < 0.9 , and RMSEA was < 0.08 . Average variance extracted (AVE) for each factor was analyzed to assess the convergent validity of the factors. The AVE values for factors > 0.5 were considered to present convergent validity. Finally, the construct's reliability was assessed through internal consistency (Cronbach's α), with values > 0.7 indicating good reliability.

RESULTS

In the pilot test, the internal consistency of MBI-SS was found to be high for emotional exhaustion ($\alpha = 0.75$)

and cynicism ($\alpha = 0.73$) but moderate for academic performance ($\alpha = 0.618$). For the full-scale study, of the available 457 dental students, 436 responded (95.4%). Three responses were discarded due to errors such as incomplete filling of sociodemographic information, and thus, 433 responses were used for all further analyses.

Sociodemographic and academic characteristics

The mean age of the participants was 21.9 ± 1.6 years, with the majority being female (58.7%). About three-fourths of the students (76.2%) had dentistry as their first course choice. The distribution of the students according to other sociodemographic and academic characteristics is shown in Table 1. About a quarter (24.5%) of the respondents took medication due to academic stress and almost half (49%) considered quitting.

Maslach Burnout Inventory-Student Survey

Table 2 shows the scale-wise distribution of study participants for each MBI-SS question. In terms of burnout across the three subscales, emotional exhaustion was present in 32.3% (95% CI: 28%–36.9%), cynicism in

Table 1: Sociodemographic and other characteristics of the dental students (N=433)

Characteristics	Frequency, n (%)
Gender	
Male	179 (41.3)
Female	254 (58.7)
Academic level	
1	108 (24.9)
2	76 (17.6)
3	83 (19.2)
4	100 (23.1)
5	66 (15.2)
What I expected the course initially to be is actually	
Worst	149 (34.4)
Same	247 (57.0)
Better	37 (8.6)
Academic performance (self-reported)	
Poor	45 (10.4)
Average	145 (33.5)
Good	187 (43.2)
Excellent	56 (12.9)
Performance of the teachers	
Incompetent	84 (19.4)
Reasonable	274 (63.3)
Competent	75 (17.3)
Infrastructure and materials	
Reasonable	275 (63.5)
Good	158 (36.5)
Place of stay	
Alone	60 (13.9)
With family	346 (79.9)
With friends	27 (6.2)
History of medication due to academic stress	
Yes	106 (24.5)
No	327 (75.5)
Thought of quitting the course	
Yes	212 (49.0)
No	221 (51.0)

Table 2: Distribution of participant's responses to Maslach Burnout Inventory-Student Survey (N=433)

Questions	Never, n (%)	Almost never, n (%)	Sometimes, n (%)	Regularly, n (%)	Often, n (%)	Almost always, n (%)	Always, n (%)
Q1	18 (4.2)	19 (4.4)	81 (18.7)	19 (4.4)	83 (19.2)	67 (15.5)	146 (33.7)
Q2	99 (22.9)	77 (17.8)	143 (33.0)	17 (3.9)	45 (10.4)	22 (5.1)	30 (6.9)
Q3	39 (9.0)	78 (18.0)	113 (26.1)	45 (10.4)	129 (29.8)	20 (4.6)	9 (2.1)
Q4	3 (0.7)	11 (2.5)	37 (8.6)	7 (1.6)	79 (18.2)	87 (20.1)	209 (48.3)
Q5	39 (9.0)	52 (12.0)	113 (26.1)	16 (3.7)	86 (19.9)	62 (14.3)	65 (15.0)
Q6	63 (14.6)	57 (13.2)	102 (23.6)	64 (14.8)	96 (22.2)	35 (8.1)	16 (3.7)
Q7	6 (1.4)	13 (3.0)	88 (20.3)	18 (4.2)	78 (18.0)	80 (18.5)	150 (34.6)
Q8	239 (55.2)	71 (16.4)	60 (13.9)	16 (3.7)	31 (7.2)	10 (2.3)	6 (1.4)
Q9	122 (28.2)	103 (23.8)	106 (24.5)	35 (8.1)	43 (9.9)	11 (2.5)	13 (3.0)
Q10	18 (4.2)	47 (10.9)	87 (20.1)	21 (4.9)	63 (14.6)	74 (17.1)	123 (28.4)
Q11	116 (26.8)	123 (28.4)	63 (14.6)	13 (3.0)	47 (10.9)	30 (6.9)	41 (9.5)
Q12	247 (57.0)	85 (19.6)	50 (11.6)	15 (3.5)	19 (4.4)	7 (1.6)	10 (2.3)
Q13	31 (7.2)	65 (15.0)	133 (30.7)	22 (5.1)	641 (4.8)	51 (11.8)	67 (15.5)
Q14	144 (33.3)	104 (24.0)	79 (18.2)	24 (5.5)	38 (8.8)	17 (3.9)	27 (6.2)
Q15	150 (34.6)	112 (25.9)	75 (17.3)	35 (8.1)	38 (8.8)	10 (2.3)	13 (3.0)

33.7% (95% CI: 29.3%–38.4%), and poor academic efficacy in 34.2% (95% CI: 29.8%–38.9%) of the dental students. However, all the three domains were not concurrently positive in any participant [Table 3].

The mean scores in emotional exhaustion and cynicism significantly increased with the academic level ($P < 0.05$). In students with a history of medication due to academic stress, the emotional exhaustion and cynicism mean scores were significantly higher than other students (for all, $P = 0.0001$). Similarly, students who considered quitting the course also had significantly higher emotional exhaustion and cynicism mean scores ($P = 0.0001$) and lower academic efficacy ($P = 0.0001$) [Table 4].

Reliability and model fit

The reliability of the MBI-SS by confirmatory factor analysis was found to be adequate for all three subscales: For emotional exhaustion, Cronbach's $\alpha = 0.827$; cynicism, $\alpha = 0.855$; academic efficacy, $\alpha = 0.704$. The level of fit was acceptable (RMSEA = 0.069). Moreover, CFI and Tucker–Lewis Index were found to be 0.923 and 0.907, respectively, which indicates good model fit. The standardized root mean square residual was 0.050, also indicating a good model fit [Table 5]. The results of the confirmatory factor analysis model with factor loadings are presented in Figure 1.

DISCUSSION

This study found that in this dental student cohort from Saudi Arabia, burnout across all three subscales were >30%. Further, emotional exhaustion and cynicism increased with academic level and were higher among those with a history of medication due to academic stress and those who considered quitting the course. The current study also provides a validated Arabic version of the MBI-SS inventory, which can be used to identify burnout

Table 3: Prevalence of psychometric properties of burnout among the dental students by percentile basis (N=433)

Domain	Frequency	Percentage (95% CI)
Emotional exhaustion		
Above 66 th percentile	140	32.3 (28.0-36.9)
Below 66 th percentile	293	67.7 (63.0-72.0)
Cynicism		
Above 66 th percentile	146	33.7 (29.3-38.4)
Below 66 th percentile	287	66.3 (61.6-70.7)
Academic efficacy		
Below 33 rd percentile	148	34.2 (29.8-38.9)
Above 33 rd percentile	285	65.8 (61.1-70.2)

*High emotional exhaustion and cynicism – Above 66th percentile; Poor academic efficacy – Below 33rd percentile; CI – Confidence interval

among Arabic-speaking students. This is particularly important given that burnout syndrome is now included within occupational diseases and recognized as a public health problem.

The internal consistency of the Arabic MBI-SS inventory was found to be adequate overall, with Cronbach's α values of >0.8 for exhaustion and cynicism. The Cronbach's α for academic efficacy (0.704) was slightly lower. However, these results are in line with studies conducted by Campos *et al.*^[18] in Brazil, Simancas-Pallares *et al.*^[22] in Colombia, and other studies across different parts of the world.^[23-25] The confirmatory factor analysis showed that the tri-factorial model is an adequate fit and thus further supported the construct validity of the MBI-SS inventory.

The three burnout subtypes were not concurrently present in any of the respondents in this study, which was also the case in the study conducted by Carlotto *et al.*^[26] Similarly, both studies found high levels of exhaustion, which is understandable given the high levels of stress faced by dental students during their dental training.^[11,27] According to Maslach's model, higher levels of emotional exhaustion could be the first signal toward the potential development of burnout. However, Campos *et al.*^[18]

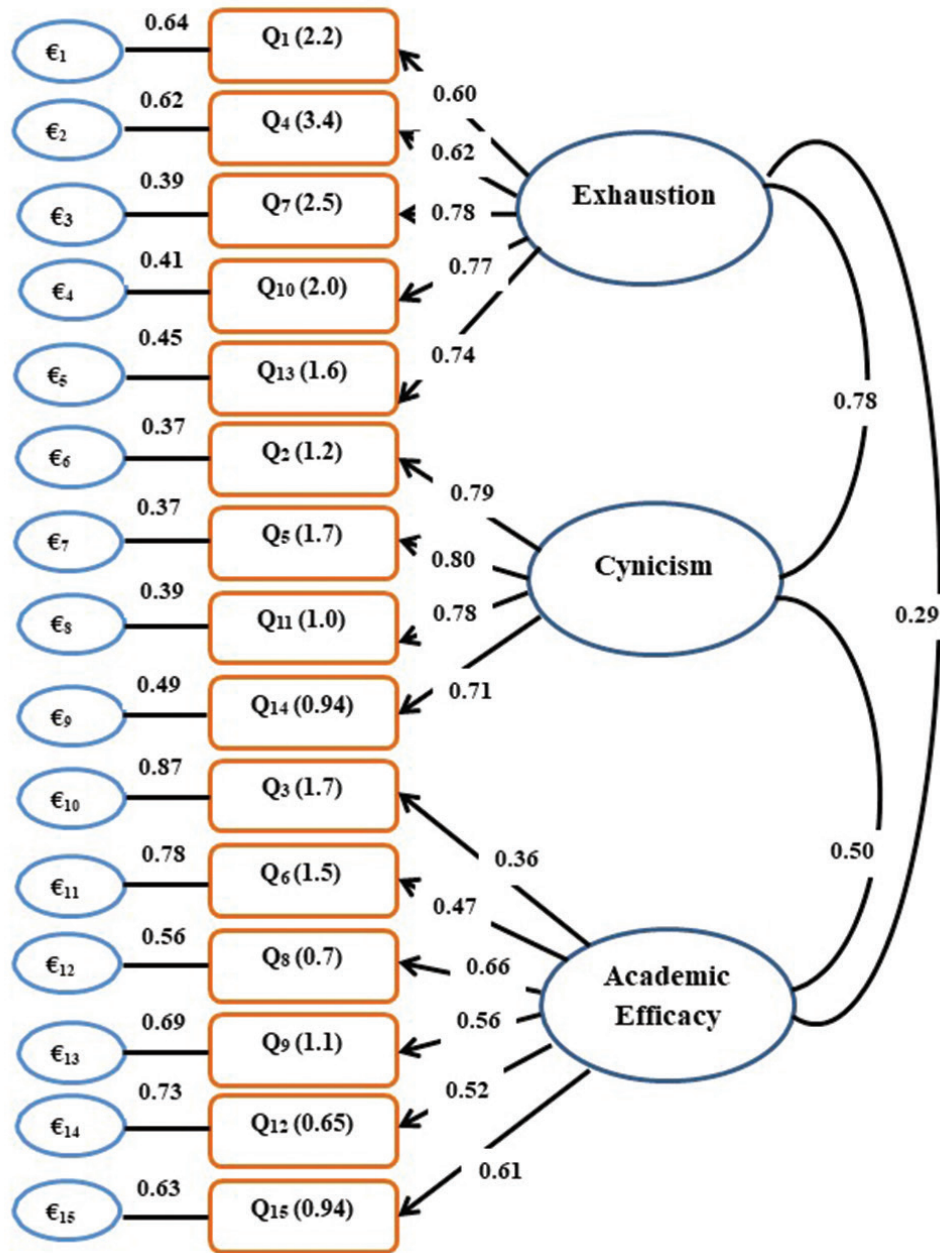


Figure 1: Maslach Burnout Inventory-Student Survey confirmatory factor analysis for the sample under study

showed that cynicism was more prevalent than the other two sub-categories of burnout.

In our study, no significant gender-based differences were noted in the scores, which is consistent with the findings of Kwak *et al.*^[13] However, another study found that the scores were higher among male students in all psychometric domains of the burnout scale. The lower scores in female students were attributed to them seeking the support of family more frequently than males.^[27]

Students at higher academic levels were found to have significantly higher scores of exhaustion and cynicism.

This could be due to higher curriculum requirements and workload demands at later years of an academic program. In line with this, Kwak *et al.*^[13] had found a significant association between academic workload (i.e., actual working hours) and exhaustion and cynicism. In contrast, few studies found higher emotional exhaustion and cynicism at lower levels of the academic programs,^[25-28] likely because at the time of intake, undergraduate students may lack the autonomy and responsibility required for professional graduate programs. However, these differences indicate the need for studies to better understand factors influencing higher emotional exhaustion and cynicism, which would help design appropriate interventional programs.

Table 4: Comparison of sociodemographic and other variables of interest by each psychometric domains of MBI-SS (N=433)

Sociodemographic variables	Emotional exhaustion		Cynicism		Academic efficacy	
	Mean±SD	P	Mean±SD	P	Mean±SD	P
Gender						
Male	19.7±6.8	0.2691	9.0±6.4	0.8672	9.9±6.0	0.245
Female	20.4±6.8		8.9±6.1		10.5±5.8	
Academic level						
1	17.9±6.5	0.0005*	6.8±5.5	0.0001*	9.7±5.6	0.0259*
2	19.7±7.0		8.6±6.3		9.6±5.8	
3	20.3±6.9		8.5±5.7		10.7±5.9	
4	21.5±6.2		10.4±6.8		9.6±5.3	
5	21.8±7.0		11.1±5.9		12.2±7.0	
Choice of dentistry						
First option	19.9±6.8	0.2934	8.4±6.0	0.0020*	9.8±5.6	0.0070*
Never first option	20.7±6.8		10.6±6.8		11.6±6.6	
What I expected the course initially to be is actually						
Worst	22.4±6.4	0.0001*	10.7±6.3	0.0001*	12.2±6.0	0.0001*
Same	19.1±6.5		8.0±5.9		9.4±5.4	
Better	17.1±7.8		7.5±7.2		7.9±6.5	
I rate my academic performance as						
Poor	22.8±7.5	0.0001*	12.4±7.4	0.0001*	14.2±8.4	0.0001*
Average	21.1±6.2		9.9±6.0		11.5±5.8	
Good	19.4±6.6		8.1±5.7		9.4±4.7	
Excellent	17.6±7.5		6.4±6.0		7.0±4.7	
I rate performance of my teachers as						
Incompetent	22.8±6.5	0.0001*	12.2±7.0	0.0001*	12.1±7.2	0.0001*
Reasonable	19.8±6.6		8.6±5.8		10.3±5.5	
Competent	18.3±7.0		6.5±5.6		7.9±5.0	
The infrastructure and materials provided are						
Reasonable	20.5±6.7	0.0728	9.5±6.2	0.0161*	10.6±6.2	0.1038
Good	19.3±6.9		8.0±6.3		9.7±5.3	
I stay						
Alone	21.9±6.5	0.0339*	10.0±7.4	0.2954	11.9±7.2	0.0622
With family	19.9±6.7		8.8±6.0		10.0±5.4	
With friends	18.2±7.3		8.0±6.1		10.3±7.6	
History of medication due to academic stress						
Yes	23.0±6.2	0.0001*	12.0±7.2	0.0001*	11.1±6.2	0.0894
No	19.2±6.7		7.9±5.6		10.0±5.7	
Thought of quitting the course						
Yes	21.9±6.1	0.0001*	11.3±6.4	0.0001*	11.5±5.8	0.0001*
No	18.4±7.0		6.7±5.2		9.1±5.7	

*Statistically significant at 5% level of significance. SD – Standard deviation

Table 5: Goodness-of-fit of Maslach Burnout Inventory-Student Survey

Fit statistic	Value	Description
Root mean square error of approximation	0.069	Acceptable model fit
Chi-square	<0.001	Poor fit
Comparative fit index	0.923	Good model fit
Tucker-Lewis index	0.907	Good model fit
Standardized root mean square residual	0.050	Good model fit

The current study found a statistically significant association between the thought of quitting the course with all dimensions of the MBI-SS. These findings were found similar to studies conducted by Campos *et al.* and Carlotto *et al.*^[18,26] Future studies should aim to determine if possible strategies such as positive reinforcement are helpful in overcoming this problem.

Similarly, a significant association was noted across the three subscales of MBI-SS and students on medications

due to academic stress, who feel that their teachers are incompetent and who have poor academic performance. In Saudi Arabia, the practice of self-medication due to academic stress has been reported among undergraduate female health cluster students.^[29] When considered with the findings of almost a quarter of the respondents in the current study using medication due to academic stress, there is a clear need for a call to action from policymakers to reduce stressors and, in turn, such practices. It should be noted that in our study, the causal effect could not be established because of the possibility of reverse causal association. For example, the students could indeed have been taking the medications because of burnout and not the contrary. The academic performance could have been poor in those students with burnout as a result of stress due to the heavy academic load, which in turn could have resulted in their skeptical attitude. A similar study conducted in Brazil also found comparable results.^[18]

Longitudinal studies would help establish the relationship with many other sources of stress among dental students and thus in developing robust preventive strategies.

A strength of this study is that it included an adequate sample size and used a standard questionnaire that has been found to be effective in assessing burnout and is easy to administer. In addition, to the best of our knowledge, this is the first study that has assessed of validity and reliability of an Arabic version of this scale in dental students from Saudi Arabia. However, as the included students belonged to a single institution, the study has a few limitations such as limited representativeness and risk of sampling bias, although this was minimized due to the high response rate. Finally, the study had inherent limitations of cross-sectional studies, wherein there is a possibility of reversing causal association.

CONCLUSIONS

All three subscales of burnout were highly prevalent among the studied dental student population from Saudi Arabia. Emotional exhaustion and cynicism increased with academic level and were higher among those with a history of medication due to academic stress and those who considered quitting the course. The developed Arabic version of the MBI-SS inventory was shown to be a valid and reliable tool for assessing psychometric properties of burnout among dental students.

Ethical considerations

This study was approved by the Scientific Research Committee at College of Dentistry, King Khalid University, Abha, Saudi Arabia, (Ref. no.: SRC/ETH/2017-18/023) on November 11, 2017. The study adhered to the Declaration of Helsinki, 2013, and all participants provided consent before inclusion.

Data availability statement

The datasets generated and/or analyzed during the current study are not publicly available due to privacy and confidentiality agreements as well as other restrictions but are available from the corresponding author on reasonable request.

Peer review

This article was peer-reviewed by four independent and anonymous reviewers.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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