

The prevalence and consequences of burnout on a group of preclinical dental students

Cigdem Atalayin¹, Murat Balkis², Huseyin Tezel¹, Banu Onal¹, Gul Kayrak³

¹Department of Restorative Dentistry, School of Dentistry, Ege University, Bornova, Izmir, Turkiye,

²Department of Psychological Counseling and Guidance, Faculty of Education, Pamukkale University, Denizli, Turkiye,

³Department of English Language Teaching (Preparatory School), School of Foreign Languages, Dokuz Eylul University, Izmir, Turkiye

Correspondence: Dr. Cigdem Atalayin
Email: dtcatalayin@gmail.com

ABSTRACT

Objective: The aim of this study is to investigate the prevalence of burnout among a group of Turkish preclinical dental students, to compare the level of burnout and to determine the consequences in structural equation model. **Materials and Methods:** Preclinical dental students ($n = 329$, 50.5% of females and 49.5% of males) aged between 18 and 24 took part in the study. Maslach burnout inventory student version, academic satisfaction scale, and personal information sheet were used to gather data. Pearson correlation analyses, t -test, and one-way ANOVA were used for statistical analysis. The proposed theoretical model was tested via observed variable path analysis using maximum likelihood parameter estimation with AMOS 7.0. **Results:** About 22.3% of students had high level of emotional exhaustion, 16.7% of students had high level of cynicism, and 17.9% of students suffered from high level of reduced academic efficacy. While the students attending the first grade reported higher level of reduced academic efficacy, the students in the third grade reported higher level of emotional exhaustion. Academic workload played an important role in the development of burnout. As consequences of burnout, students with high levels of burnout intended to change their current major and did not to plan to continue to postgraduate education. Students with high level of burnout reported less level of academic satisfaction and academic achievement. **Conclusions:** Creating awareness on the burnout of dental students from the preclinical period may be useful for prevention and more compatible dental education environment.

Key words: Academic workload, burnout, dental education, preclinical, stress

INTRODUCTION

Stress among dental students has become a favorite subject for the researchers focused on dental education in recent years.^[1-4] Dental education includes mainly two different phases as preclinical and clinical period. The lengths of dental schools vary among the different countries in the world. The preclinical period usually comprises first 2 or 3 years and clinical period covers last 2 years of the dental education. It consists of a series of courses and application programs to teach the basics of professional dental practice and impart the clinical skills. Dental students may experience high levels of stress arising from different sources during these periods. For instance, the first phase of dental education known as preclinical period includes intensive basic medical and dental lessons to give notion of medicine and laboratory practices to improve

dexterity of students. It also comprises the simulation of the clinical stages and thereby future clinicians are prepared for dental practice. The severe theoretical knowledge and laboratory practices, examinations, time and schedule pressures, financial issues, staff, and equipment problems may cause a stressful learning environment.^[3,4] Humphris *et al.*^[2] stated that over a third of the dental students reported significant

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psychological distress. Considerable research has revealed that high level of stress has negative effect on dental students.^[4] For example, stress may result in lower academic performance, more anxiety, higher levels of depression than age-matched norms in dental students,^[5] and cause burnout related to the factors such as high level and prolonged exposure.^[6]

Burnout was first defined by Freudenberger^[7] and known as the situation of physical or mental collapse caused by overwork or stress.^[6] Burnout consists of three dimensions; emotional exhaustion, depersonalization, and reduced personal accomplishment.^[6]

Initially, burnout was considered as a work-related phenomenon, but it may also exist in students.^[8] Bresó *et al.*,^[8] stated that students may be seen as an employed from a psychological perspective. Because, they are engaged in structured, coercive activities such as attending classes, completing assignments and are directed toward specific goals like passing exams. Thus, recently considerable researches have revealed that it is commonly seen among college students including dental students.^[9-12] For example, Humphris *et al.*^[2] reported that 22% of dental students had high levels of emotional exhaustion. Pöhlmann *et al.*^[11] reported that 10% of the dental students were emotionally exhausted, 17% suffered from lack of accomplishment, and 28% scored high on depersonalization. Badran *et al.*^[9] reported that dental students suffer from high levels of emotional exhaustion. Gorter *et al.*^[10] reported that 39% of dental students were high on emotional exhaustion, 22% of students were high on depersonalization, and 41% of students were high on low personal accomplishment. Schaufeli *et al.*^[13] conceptualized students' burnout with three dimensions; emotional exhaustion, cynicism, and reduced academic efficacy. They defined students' burnout as feeling exhausted due to study demands, detached attitude and cynicism in school works and feeling incompetent.

Besides the prevalence of burnout syndrome among college students, considerable researches have revealed that students' burnout is related to perceived workload,^[11,14] perceived stress,^[10,11] examination anxiety,^[13] and academic performance.^[12] As seen from above studies, while burnout stems from internal (anxiety, stress) and external (workload) factors, at the same, it may influence students in terms of both internal and external consequences.

External consequences of burnout can be conceptualized as directly a function of burnout.

For example, low academic achievement could be considered as an external consequence of burnout on students. Studies suggested that burnout has an adverse effect on academic performance.^[12,13,15,16]

The internal consequences of burnout can be conceptualized as mostly a function of intra-psychic process that may affect the well-being of students directly. Capri *et al.*^[17] reported that life satisfaction is inversely related to all burnout dimensions. The negative consequences of burnout provide us with the fact that a life for the burned students is intricate and apparently uncontrollable. Thus, the college experience is likely to be unpleasant for the burned out students. In this way, it is expected that burnout may also affect students' academic satisfaction.

Although extensive researches have been carried out on burnout among dental students, no single study exists which investigated the effects of burnout on dental students. It may inhibit to see a clear picture about nature of burnout among dental students. Examining aspects and consequences of burnout among dental students in single study may provide a clear picture about nature of this syndrome. This study was therefore set out to assess the effects of burnout on dental students. The aims of this study were to: (i) Assess the prevalence of burnout among a group of Turkish preclinical dental students, (ii) compare the levels of burnout in respect to demographics variables, and (iii) to determine the consequences of burnout in structural equation model [Figure 1]. More specifically this study asks following questions:

- What is the prevalence of burnout among preclinical dental students?
- Does the level of students' burnout differ in accordance with demographic variables (gender, grade level, and accommodation)?
- Is there relationship between burnout, academic workload, academic life satisfaction, and academic achievement?

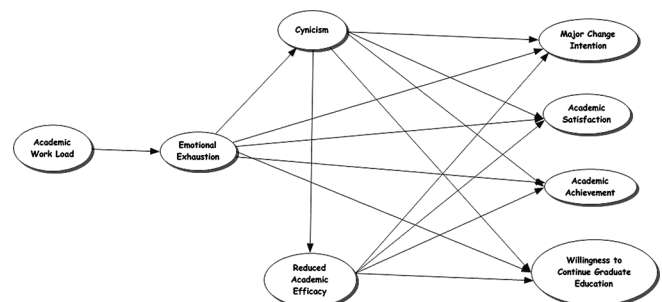


Figure 1: A theoretical depicting the consequences of burnout in preclinical dental students

- Does academic workload predict students' burnout?
- Does students' burnout predict academic life satisfaction, academic achievement, major change intention, and willingness to continue graduate education?

MATERIALS AND METHODS

A cross-sectional study was carried among students in preclinical phase at School of Dentistry at Ege University in Turkey.

Participants

This study comprised of all students in preclinical phase (first, second, and third grade) at the School of Dentistry in Izmir during 2012 and 2013 Academic Year in Turkey. Participants were selected randomly. Out of 455 students attending preclinical phase, 329 (50.5% of females, 49.5% of males, 0.06% of married, 99.4% of single, 73.3% of living away from family, 26.7% of living with family) preclinical dental students responded to an anonymous questionnaire voluntarily (response rate 72%). Participants' ages ranged between 18 and 24 with a mean of 21.32 (standard deviation [SD] = 1.43) for total samples. Participants included 43.8% of first grade, 25.5% of second grade, and 30.7% of third grade.

Procedure

The present study was approved by Human Ethical Committee of Ege University (Research no. 12-7/35) and there was no conflict of interest. The survey was administered at the fall semester of 2012 and 2013 academic year. Participant responses were anonymous. Nonidentifying numerical codes were used for data collection and entry in order to maintain anonymity. None of the investigators had access to identifying information for individual participants of this study.

Instruments and variables

Maslach burnout inventory student version

Maslach burnout inventory student version was designed by Schaufeli *et al.*,^[13] to measure the burnout levels of students. It contains 15 items that evaluate the dimensions of emotional exhaustion (5 items), cynicism (4 items), and academic efficacy (6 items). Students specify their agreement with every item, which is scored on a 7-point Likert response scale. High scores on emotional exhaustion and cynicism dimensions and low perception of academic efficacy are indicators of students' burnout. All items of academic efficacy are reversely scored in this study.

Balkis^[18] examined psychometrics properties of MBS-SV for Turkish college sample. They reported internal consistency coefficient alpha of 0.83 for emotional exhaustion, 0.80 for cynicism, 0.70 for academic efficacy, and 0.83 for total scale for Turkish sample.

Academic satisfaction scale

Academic satisfaction scale (ASS) was developed by Schmitt *et al.*^[19] to assess participants' academic life satisfaction. The scale includes five items designed to assess students' academic satisfaction. Students must indicate the level of agreement with each item, which is scored on a 5-point Likert response scale from 1 (Strongly Disagree) to 5 (Strongly Agree). Balkis^[18] examined psychometrics properties of ASS for Turkish college sample. The results of this analysis showed that the scale had one factor, accounting for 63.70% of the common variance (eigenvalue = 3.19). The internal consistency coefficient alpha was found to be 0.86 for the Turkish sample.^[20]

Academic workload items

The number of hours spent for reading assignments (theoretical lessons) and the number of hours spent to participate in laboratory activities (each week).

Major change intention

It was measured by one question "If you had a chance, would you like to change your current major?"

Willingness to continue graduate education

It was measured by one question "Would you like to continue graduate education after completing undergraduate education?"

Academic achievement

It was represented by grade point average that students had achieved up to previous semester before the questionnaire was filled out.

Demographic information sheet

Demographics information sheet, prepared for this study, includes personal information such as gender, age, housing, marital status, grade, smoking, and alcohol consumption.

Statistical analyses

For the analysis of the data, SPSS 15 and AMOS 7.0 (IBM) programs were used. Pearson Correlation was utilized to set the relationships between variations; *t*-test and one-way ANOVA were also used to test whether the dependent variation differentiated with

respect to independent variations. The statistical method of structural equation modeling (SEM) was used to estimate the aspects (i.e., academic workload) and consequences of burnout (i.e., academic satisfaction, academic achievement, major change intention, and willingness to continue graduate education). The fit of the model was assessed by considering the model's Chi-square (χ^2), Root Mean Square of Error Approximations (RMSEA), fit indices, comparative fit index (CFI), incremental fit index (IFI), goodness of fit index (GFI), and normed fit index (NFI). For each of these fit indices, values greater than 0.90 indicate fits very well. Also, standardized root mean square residual (SRMR) and RMSEA values ≤ 0.08 , and a nonsignificant χ^2 ($P > 0.05$), and χ^2 ratio was below the suggested 2:1 ratio represent acceptable model fit.^[21]

RESULTS

The prevalence of burnout

In order to test first question, descriptive statistics were used to determine the prevalence of the burnout among preclinical dental students, the mean and SD of total scores of students in the burnout inventory were measured; the groups that were one SD above and below the average were appointed as the groups representing low and high levels of burnout. In the assessment process, it was concluded that 22.3% of students had a high level of emotional exhaustion, 16.7% of students had a high level of cynicism, and 17.9% of students had a high level of reduced academic efficacy [Figure 2]. Table 1 provides the detailed results of the descriptive statistics.

Burnout-gender

In order to test the second question, an independent sample *t*-test was performed to determine gender difference on burnout, the analysis indicated that the average of emotional exhaustion scores for female students (mean = 27.55, SD = 5.66) was higher than the average of scores for male students (mean = 25.61, SD = 6.74) and this difference was meaningful at $P < 0.001$ level. The female students had a higher level of emotional exhaustion than the male students. The *t*-test analyses indicated that cynicism and reduced academic efficacy did not differ with respect to gender.

Burnout-grade level relation

In order to test the second question, one-way ANOVA was performed to determine the differences in burnout depending on the grade level variable. Emotional

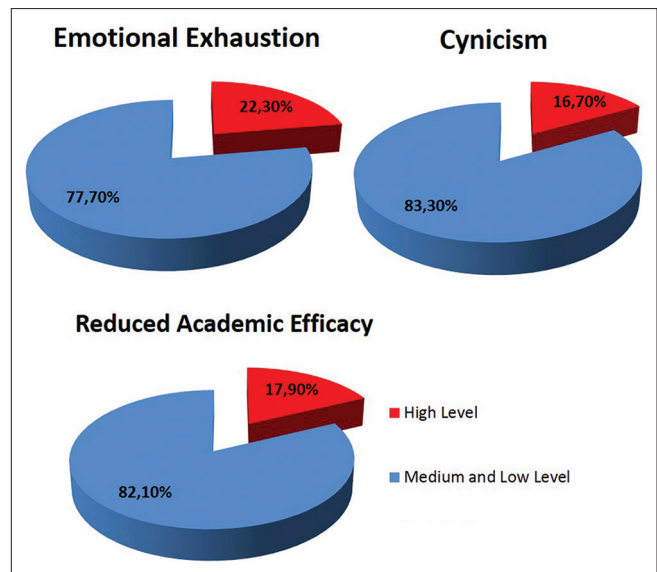


Figure 2: The prevalence of burnout dimensions in preclinical dental students ($n = 329$)

Table 1: The mean total scores and SD on MBI-SV of the preclinical students

Variables	<i>n</i>	Mean	SD
Emotional exhaustion	329	26.59	6.29
Cynicism	329	17.41	5.78
Reduced academic efficacy*	329	19.56	6.42

*All items of academic efficacy are reversely scored. SD: Standard deviation, MBI-SV: Maslach Burnout Inventory Student Version

exhaustion ($F [2.326] = 12.41, P < 0.001$) and reduced academic efficacy ($F [2.326] = 3.80, P < 0.05$) revealed significant differences depending on the grade level variable. Tukey test was used to determine the sources of the differences and it was obtained that the emotional exhaustion level of the students attending the third grade (mean = 28.96, SD = 5.30) was higher than that of the first (mean = 26.06, SD = 6.38) and second grade (mean = 24.66, SD = 6.40) groups. Furthermore, the reduced academic efficacy level of the students attending the first grade (mean = 20.34, SD = 6.65) was higher than that of the third grade (mean = 18.12, SD = 5.83) group.

Burnout-accommodation

In order to test second question, *t*-test was performed. The preclinical dental students living away from the family (mean = 20.21, SD = 6.60) had a higher reduced academic efficacy level than the students who are living with the family (mean = 17.80, SD = 5.57) and the difference was significant ($P < 0.01$).

The analysis also indicated that burnout did not significantly differ in respect to smoking and alcohol consumption variables.

The relationship between burnout, workload, academic life satisfaction and academic achievement

In order to test the third question that whether burnout was related to workload, academic satisfaction, and academic achievement, the correlation between burnout, workload, academic satisfaction scores, and academic achievement scores were initially examined by utilizing a Pearson product-moment correlational analysis. Results showed statistically significant correlations between burnout, workload, academic satisfaction scores and academic achievement. Academic satisfaction was negatively correlated with all dimensions of students' burnout. Workload was significantly and positively related to emotional exhaustion. Academic achievement was positively correlated with workload, and negatively related to reduced academic efficacy. Table 2 provides the detailed results of these correlational analyses and descriptive statistics.

Aspects and consequences of burnout

To test the fourth and fifth questions, the SEM was employed using AMOS 7.0 software.^[22] The results therein indicate that the model was accepted as adequate: $\chi^2 (5, n = 263) = 6.664$ and $P > 0.247$. The χ^2 ratio was below the suggested 2:1 ratio ($\chi^2/df = 1.333$). GFI = 0.99, adjusted GFI = 0.96, RMSEA = 0.036 (0.00;0.098), SRMR = 0.023, CFI = 0.99, Tucker-Lewis Index = 0.97, IFI = 0.99, NFI = 0.98 [Figure 3].

The result of the path analysis is illustrated in Figure 3. While academic workload predicts emotional exhaustion ($\beta = 0.27, P < 0.001$), it does not predict cynicism ($\beta = -0.05, P > 0.05$) or reduced academic efficacy directly ($\beta = -0.10, P > 0.05$). Academic workload predicts cynicism by mediation of emotional exhaustion ($\beta = 0.55, P < 0.001$). In other words, emotional exhaustion fully mediates the relationship between academic workload and cynicism. Academic workload also directly predicts academic satisfaction ($\beta = -0.12, P < 0.05$) and academic achievement ($\beta = 0.14, P < 0.05$) and; predicts major change intention by mediation of emotional exhaustion ($\beta = -0.24, P < 0.001$). In other word, emotional exhaustion fully mediates the relationship between academic workload and major intention change.

The results from SEM analyses show that emotional exhaustion directly predicts cynicism ($\beta = 0.55, P < 0.001$). Students with high level of emotional exhaustion are more likely to be cynics. Emotional exhaustion does not predict reduced academic

Table 2: The relationship between burnout, workload, academic life satisfaction, and academic achievement in preclinical dental students

	1	2	3	4	5	6
Emotional exhaustion	- 0.578**	0.031	-0.214**	0.103	0.262**	
Cynicism		-	0.204**	-0.304**	-0.037	0.094
Reduced academic efficacy***			-	-0.232**	-0.197**	-0.096
Academic satisfaction				-	0.019	-0.092
Academic achievement					-	0.174**
Workload						-

* $P < 0.05$, ** $P < 0.001$, ***All items of academic efficacy are reversely scored^[20]

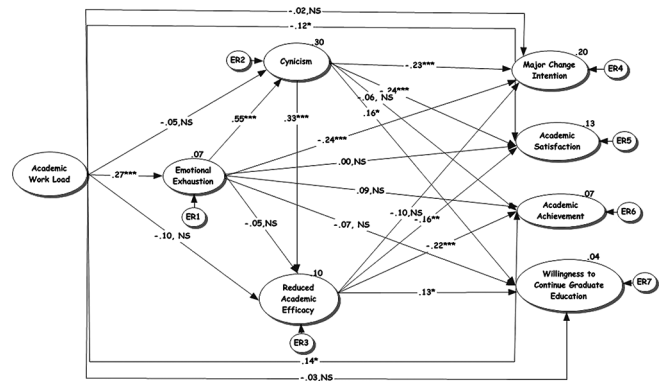


Figure 3: The results of the structural equation modeling analyses for the consequences of burnout in preclinical dental students (** $P < 0.001$, * $P < 0.05$)

efficacy directly ($\beta = -0.05, P > 0.05$) and; predicts reduced academic efficacy via cynicism ($\beta = 0.55, P < 0.001$). Cynicism had a full mediation role in relation to emotional exhaustion and reduced academic efficacy. In other words, the SEM analyses show that emotional exhaustion directly predicts major change intention ($\beta = -0.24, P < 0.001$) and by mediation of cynicism ($\beta = -0.23, P < 0.001$). Cynicism also mediates the relations between emotional exhaustion-academic satisfaction ($\beta = -0.24, P < 0.001$) and emotional exhaustion-willingness to continue graduate education ($\beta = 0.16, P < 0.05$). In other words, cynicism has a partial mediation role in relation to emotional exhaustion-major change intention and; a full mediation role in relation to emotional exhaustion-academic satisfaction and emotional exhaustion-willingness to continue graduate education. Finally, the results from SEM analyses show that cynicism directly predicts major change intention ($\beta = -0.23, P < 0.001$), academic satisfaction ($\beta = -0.24, P < 0.001$) and willingness to continue graduate education ($\beta = 0.16, P < 0.05$). Reduced academic efficacy fully mediates the relation between cynicism and academic achievement ($\beta = -0.22, P < 0.001$) and; partially

mediates the relations between cynicism and academic satisfaction ($\beta = -0.16, P < 0.05$); cynicism and willingness to continue graduate education ($\beta = 0.13, P < 0.05$). In other words, reduced academic efficacy has a partial mediation role in relation to cynicism–academic satisfaction and cynicism–willingness to continue graduate education. On the other hand, it has a full mediation role in relation to cynicism–academic achievement. Reduced academic efficacy also predicts academic satisfaction ($\beta = -0.16, P < 0.05$), academic achievement ($\beta = -0.22, P < 0.001$), and willingness to continue graduate education ($\beta = 0.13, P < 0.05$). Academic workload accounted for 7% of the variance in emotional exhaustion. Academic workload and emotional exhaustion accounted for 30% of variance in cynicism. The academic workload, emotional exhaustion, and cynicism accounted for 10% of the variance in reduced academic efficacy. Collectively, academic workload, emotional exhaustion, cynicism, and reduced academic efficacy accounted for 20% variance in major change intention, 13% of variance in academic satisfaction, 7% of variance in academic achievement, and accounted for 4% of variance in willingness to continue graduate education.

DISCUSSION

The present study was designed to: (i) Determine the prevalence of burnout among a group of Turkish preclinical dental students, (ii) compare the levels of burnout in respect to demographics variables, and (iii) to test the aspects and consequences of burnout in SEM.

The first research question of this study stated that what is the prevalence of burnout among preclinical dental students? The results of this study indicate that approximately 22% of preclinical dental students suffered from emotional exhaustion, 17% of students suffered from cynicism, and 18% of students suffered from reduced academic efficacy. The present findings seem to be consistent with other researches that found dental students suffered from burnout.^[2,9-11]

As related second research question, the results show that the level of burnout among preclinical dental students differs in respect to demographics variables. Female students were reported to have a higher level of emotional exhaustion than male students. These results confirm previous research indicating that female students are more emotional exhausted than males.^[10] A previous study on gender differences in stress reported that female dental students have higher levels of stress than male dental students. For

example, Naidu *et al.*^[3] observed that academic work was more stressful for female dental students. Based on these findings, it can be speculated that gender differences on emotional exhaustion might serve as a function of stress difference among genders.

As related second research question, one of the most important findings of this study was that the level of burnout differs in respect to grade in preclinical period. The students attending the first grade reported a higher level of reduced academic efficacy in this study. Dental preclinical procedures may be difficult for the beginning dental students, and this condition may be associated with the higher level of reduced academic efficacy in the 1st year. Students in the third grade reported a higher level of emotional exhaustion. This finding is compatible with the previous researches that reported emotional exhaustion peak in the following years.^[10] The increased academic workload and the cumulative stress before the clinical period may be related to this higher level of emotional exhaustion in the third grade. This finding suggests the need to prevent the burnout of preclinical dental students before the intense clinical period. Otherwise, dental students will start to professional practice with burnout.

As related second research question, the other important finding of this study was that the level of burnout differs in respect to accommodation. Students living away from family reported higher level of reduced academic efficacy. Thus, it can be speculated that accommodation differences on burnout scores might serve as a function of stress and lack of social support. Humphris *et al.*,^[2] found that students living away from family experienced greater burnout than those living at home. Social support is negatively related to burnout. For instance, Jacobs and Dodd^[14] found that burnout was negatively related with social support in college students.

Aspects and consequences of burnout

As related to fourth and fifth research questions, SEM analyses showed that academic workload directly predicts emotional exhaustion and indirectly predicts cynicism by mediation of emotional exhaustion. In other words, emotional exhaustion fully mediates effects of academic workload on cynicism. The results also showed that emotional exhaustion directly predicts cynicism and; indirectly predicts reduced academic efficacy by mediation of cynicism. In other words, effects of emotional exhaustion on reduced academic efficacy may change compared to level of cynicism. This finding suggests that (i) academic workload predicts

emotional exhaustion, (ii) high level of emotional exhaustion predicts cynicism, and (iii) high level of cynicism predicts reduced academic efficacy [Figure 4]. Results from SEM analyses also showed that emotional exhaustion has a direct effect on major intention change and; it indirectly impacts on academic satisfaction, academic achievement and willingness to continue graduate education. Cynicism has direct effect on major change intention, academic satisfaction, and willingness to continue graduate education and; also indirectly impacts on academic achievement. Finally, reduced academic efficacy has a direct effect on academic satisfaction, academic achievement and willingness to continue graduate education. These findings suggest that students with a high level of emotional exhaustion and cynicism would like to change their current major. Students with a high level of cynicism and reduced academic efficacy do not intend to continue graduate education after completing undergraduate education and they are dissatisfied with their academic performance. Students with a high level of reduced academic efficacy also have a poor academic achievement. These results are consistent with those of other studies and suggest that students with a high level of burnout are less satisfied with life^[17] and; achieve lower academic performance outcomes.^[12,13,15,16] The results of the current study also suggest that students with a high level of burnout intend to change their current major. This finding is consistent with previous studies,^[23,24] and it suggested that persons with high level of burnout intended to change/quit their current jobs^[23] or thought of dropping course.^[24]

The results of this study should be considered in the light of its limitations. The most important limitation of this study is its cross-sectional design. Further research could be conducted using different research designs such as in-depth interviews or case studies,

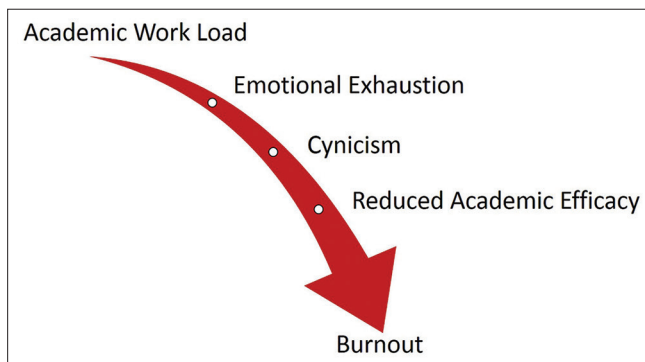


Figure 4: A flowchart for the prediction of burnout in preclinical dental students

and they may be helpful in understanding the causes and consequences of dental students. Further research could be conducted in different dental education phases in different schools to determine the generalizability of these findings.

CONCLUSION

The findings of this study indicate that: (i) Turkish (a group of) preclinical dental students suffered considerable degree of burnout. This study suggests that informational meetings should be organized for students and academic staffs to increase awareness about burnout and its effects on students. (ii) Academic workload played an important role in the development of burnout among Turkish preclinical dental students. As suggested by Ahmad *et al.*^[25] dental educators can cooperate with curriculum and instruction experts to redesign and develop a curriculum structure that is student-oriented. (iii) Students with a high level of burnout were less satisfied with their academic experience and; achieved lower academic performance outcomes, (iv) students with high level of burnout intended to change their current major and; (v) did not intend to continue postgraduate education after undergraduate education. The determination of the burnout among preclinical dental students and the prevention of the burnout with different strategies in the education program may be useful to provide more compatible preclinical and then clinical education environment. For this purpose, the training programs to improve communication with students in order to reduce stress (stress management, self-reflection etc.,) would be helpful. Considering dentistry, this approach may ensure education of healthy dental professions/generations and thereby increase of the quality of oral and dental health services.

The findings of this study also have some important implications for mental health practitioners. Our findings reveal the fact that burnout, which is observed as a common problem among students, affect several things such as, students' functionality, satisfaction and their point of view regarding the future by causing them to suffer from some psychological problems such as hopelessness. When a student asks for psychiatric consultancy with complaints such as, disappointment caused by high expectations, inactivity as a result of lack of energy, frustration because of giving up personal expectations, lack of interest, and sensitivity, and so on, mental health practitioners may offer them more efficient assistance depending on the potential diagnosis of burnout.

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Conflicts of interest

There are no conflicts of interest.

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