

Prevalence of burnout in undergraduate dental students: a systematic review

Prevalencia de burnout en estudiantes de grado de odontología: una revisión sistemática

Prevalência de burnout em estudantes de graduação em Odontologia: uma revisão sistemática

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Abstract

Objective: To describe the prevalence of burnout and its dimensions in undergraduate dental students, through a systematic review of the literature.

Methods: A biomedical search was carried out in the PubMed database regarding the prevalence of burnout and its dimensions in undergraduate dental students, measured with MBI-HSS and MBI-SS questionnaires, in English between 2002 and 2019. The studies were independently selected by two investigators according to eligibility criteria. Study bias analysis and a qualitative review of the included articles was performed.

Results: 11 articles were included. There is great variability in the prevalence's reported by the reviewed articles, ranging between 7% and 41.3% in studies with the MBI-SS questionnaire, and between 25.6% and 50.9% in those that used the MBI questionnaire. -HSS.

Conclusion: All the studies indicate that the presence of burnout during undergraduate dentistry training is a problem that must be addressed and that to reduce its frequency it is necessary to make improvements in undergraduate training in dentistry.

Keywords: burnout, professional, students, dental, psychological.

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Resumen

Objetivo: Describir la prevalencia del burnout y de sus tres dimensiones en estudiantes de grado de la carrera de odontología, mediante una revisión sistemática de la literatura.

Métodos: Se realizó una búsqueda biomédica en la base de datos PubMed respecto a la prevalencia de burnout y sus dimensiones en estudiantes de grado de odontología, medidos con cuestionarios MBI-HSS y MBI-SS, en inglés entre 2002 y 2019. Los estudios fueron seleccionados por dos investigadores en forma independiente de acuerdo con los criterios de elegibilidad. Se realizó análisis de sesgo de los estudios y una revisión cualitativa de los artículos incluidos.

Resultados: Se incluyeron 11 artículos. Existe gran variabilidad en las prevalencias reportadas por los artículos revisados, que van entre 7% y 41,3% en estudios con el cuestionario MBI-SS, y entre un 25,6% a 50,9% en los que usaron el cuestionario MBI-HSS.

Conclusiones: La totalidad de los estudios indican que la presencia de burnout durante la formación de grado en odontología es una problemática que debe ser abordada y que para disminuir su frecuencia es necesario realizar mejoras en la formación de grado en odontología.

Palabras claves: burnout profesional, estudiantes de odontología, burnout psicológico.

Resumo

Objetivo: Descrever a prevalência de burnout e suas dimensões em estudantes de graduação em Odontologia, por meio de uma revisão sistemática da literatura.

Métodos: Foi realizada uma busca biomédica na base de dados PubMed sobre a prevalência de burnout e suas dimensões em estudantes de graduação em Odontologia, medida com os questionários MBI-HSS e MBI-SS, em inglês entre 2002 e 2019. Os estudos foram selecionados por dois pesquisadores independentemente de acordo com os critérios de elegibilidade. Foi realizada análise de viés dos estudos e revisão qualitativa dos artigos incluídos.

Resultados: 11 artigos foram incluídos. Há grande variabilidade nas prevalências relatadas pelos artigos revisados, variando entre 7% e 41,3% nos estudos com o questionário MBI-SS, e entre 25,6% e 50,9% naqueles que utilizaram o questionário MBI-HSS.

Conclusão: Todos os estudos apontam que a presença de burnout durante a graduação em odontologia é um problema que deve ser enfrentado e que para reduzir sua frequência é necessário realizar melhorias na formação na graduação em odontologia.

Palavras-chave: burnout profissional, estudantes de odontologia, burnout psicológico.

Introduction

The concept of burnout was first mentioned in 1974 by Herbert Freudberg, who defined it as the result of excessive demands on energy, strength or resources in the workplace. It also manifests through fatigue, malaise, frustration, cynicism and/or inefficiency in health professionals ⁽¹⁾. In 1976 and based on Freudberg's study, psychologist Christina Maslach defined burnout as a syndrome resulting from a state of chronic stress in health professionals ⁽²⁾ and including

three dimensions: *emotional exhaustion*, *depersonalization*, and *a diminished sense of personal accomplishment* ⁽¹⁾. Since then, various authors have suggested different conceptual definitions of burnout, agreeing that it is a three-dimensional syndrome ⁽³⁾. *Emotional exhaustion* refers to feeling no longer available to give themselves, *depersonalization* refers to feeling coldness and a distant attitude towards patients, and finally, *a diminished sense of personal accomplishment* indicates feeling they are not doing their job co-

rectly and feeling incompetent when tackling work-related difficulties ⁽²⁾.

Burnout has been measured with different instruments. However, the most widely used to date is the Maslach Burnout Inventory (MBI) proposed by Maslach and Jackson in 1981 ⁽¹⁾. It is currently known as the Maslach Burnout Inventory-Human Services Survey (MBI-HSS): a 22-item questionnaire that assesses the three dimensions of burnout in health professionals, including the dimensions described above ⁽²⁾.

The original version of the MBI-HSS questionnaire has been adapted to other contexts, such as the Maslach Burnout Inventory-Educators Survey (MBI-ES), which assesses burnout in people working in education and uses the same dimensions as the MBI-HSS questionnaire, replacing the word “patient” with “student” in the questions ^(2,4).

The Maslach Burnout Inventory-General Survey (MBI-GS) is another modification of the original questionnaire. It is an instrument that enables the study of burnout in professions outside healthcare. This questionnaire modifies the MBI-HSS dimensions and conceptualizes them more broadly, measuring *burnout*, *cynicism*, and *reduced professional efficiency* ⁽⁴⁾. Finally, the MBI-GS was adapted in 2002 to measure burnout in university students, giving rise to the Maslach Burnout Inventory-Student Survey (MBI-SS). This questionnaire includes fifteen questions grouped into three dimensions. The *exhaustion dimension* reflects tiredness due to the demands of studying, with questions such as “I am exhausted from so much studying.” *Cynicism* reflects attitudes of disinterest, self-sabotage in academic activities, and doubts about the value of studying, with questions such as “I have lost interest in my degree since I started university”. The dimension *reduction in academic efficiency* refers to feeling incompetent as a student, with statements such as “In my opinion, I am a good student” ⁽²⁾.

Burnout is recognized as a public health problem and a work-related occupational disease

⁽⁵⁾. As a health profession, dentistry involves various physical, chemical, postural and biological risks, and working in a small area. These factors and treating patients and economic demands make dentistry a highly stressful profession ⁽⁵⁾. Initially, burnout was attributed exclusively to professionals who interacted with patients or clients. However, we now know that it can affect any individual constantly exposed to demanding emotions ⁽⁶⁾. Also, evidence of burnout has been found among undergraduate dental students. Therefore, this literature review aims to describe the prevalence of burnout and its dimensions among undergraduate dental students through a systematic literature review. It also aims to increase awareness of this problem, which occurs throughout the academic training of future dentists, and thus contribute to producing evidence to support curricular change and designing interventions that promote student health.

Material and methods

Review protocol: The PRISMA statement for reporting systematic reviews was used. The following question was posed: What is the prevalence of burnout and its dimensions in undergraduate dental students?

Eligibility criteria: Cross-sectional prevalence studies were included, reporting the prevalence of burnout and/or the prevalence of burnout dimensions in undergraduate dental students, using the MBI-HSS or MBI-SS questionnaire in English and published between 2002 and 2019. We excluded duplicate articles and those without a downloadable full text.

Search strategy: A literature search was conducted in the PubMed database. The following search strategies were used: (“Burnout, Professional” [Mesh]) AND “Students, Dental” [Mesh]; (Burnout, Psychological” [Mesh]) AND “Students, Dental” [Mesh]; Burnout AND dental students. The search was conducted on 28 May 2020.

Screening process: Two researchers independently reviewed articles by title and abstract and then downloaded the full text. The studies to be reviewed were selected according to the eligibility criteria.

Data extraction: The following data were extracted from the articles included: descriptive characteristics of the studies (author, year, city), population characteristics (sample size, sex distribution, average age), the prevalence of burnout and burnout dimensions reported by the studies using the MBI-HSS or MBI-SS questionnaire and their main findings.

Bias assessment: The Joanna Briggs Institute Systematic Review Checklist for Prevalence Studies Items was used⁽⁷⁾. The articles were classified as having a low risk of bias when over 70% of the items received a “yes” answer, a moderate bias when the “yes” answers corresponded to between 50% and 69% of the items, and a high risk of bias when less than 49% of the items received a “yes” answer.

Results

Study selection: The literature search strategy yielded 112 scientific articles. After eliminating duplicates, the title and abstract of 56 articles

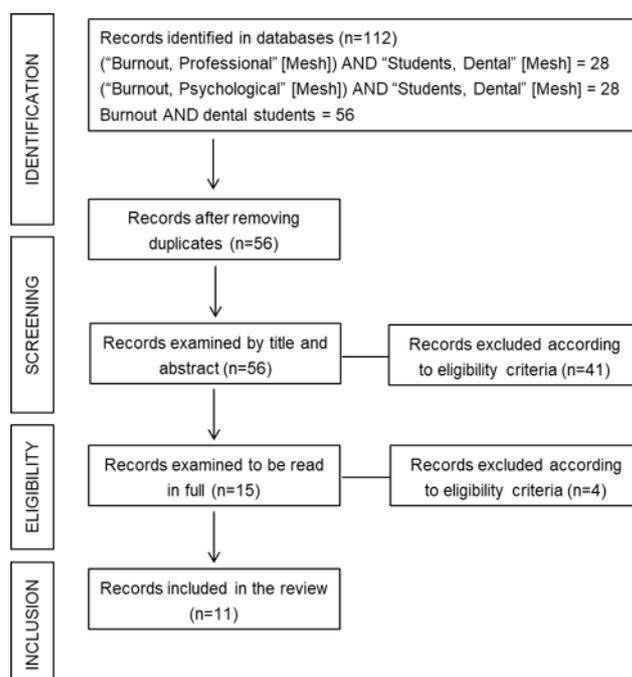
were read. Fifteen papers were considered for full-text reading, 4 were excluded because they did not meet the eligibility criteria, and 11 articles were selected for review^(5,8-17) (Figure 1).

Characteristics: Eleven articles^(5,8-17) published between 2002 and 2019 were reviewed. The studies were conducted in 12 countries. Five articles applied the MBI-HSS questionnaire^(11,13-16), five applied the MBI-SS questionnaire^(5,8,10,12,17), and one used both⁽⁹⁾.

Bias assessment: The assessment was performed with the Joanna Briggs Institute’s prevalence study review checklist (see Figure 2). Most studies were assessed as having a low bias^(5,8-12,15-17), and two studies were considered to have a moderate risk of bias^(13,14).

Summary of results: The results were summarized according to the instrument used to measure burnout. The main difficulty appeared when reporting the results since not all studies showed the results of burnout prevalence and its dimensions simultaneously. Table 1 summarizes the main results of the studies applying the MBI-HSS questionnaire^(9,11,13-16), and table 2 summarizes those using the MBI-SS questionnaire^(5,8,10,12,17). The MBI-HSS was used when the participants

Figure 1: Literature search and selection process



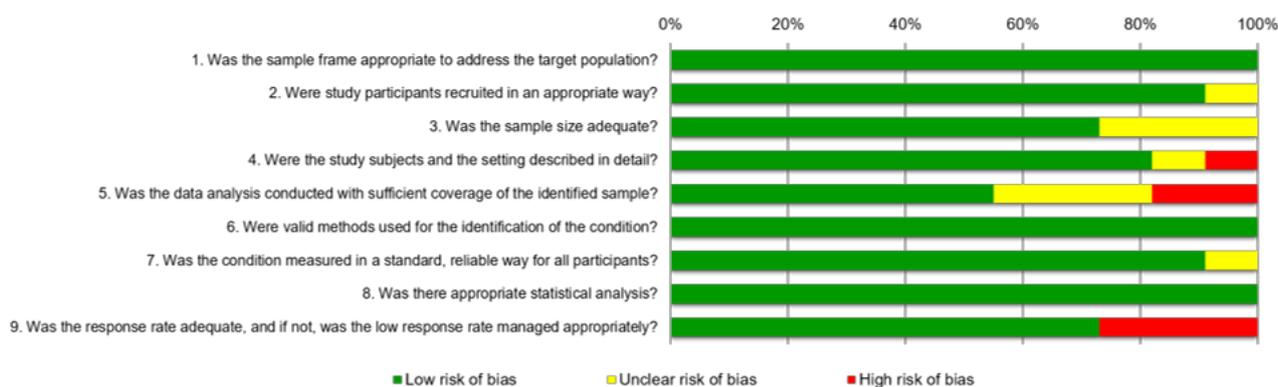
were students already in clinical practice. The articles reviewed report a great variability in burnout prevalence, ranging from 7% to 41.3% in studies using the MBI-SS questionnaire, and 25.6% to 50.9% in studies using the MBI-HSS questionnaire.

The prevalence rates for emotional exhaustion

symptoms measured with the MBI-HSS questionnaire ranged between 10 and 49.1%, and with the MBI-SS questionnaire, between 22.3% and 52%.

The prevalence rates for depersonalization symptoms (MBI-HSS) and cynicism (MBI-SS) ranged between 11, 29.8%, and 16.7% and 18%.

Figure 2: Summary of risk of bias assessment using Joanna Briggs' prevalence study review checklist ⁽⁷⁾



The prevalence rates for symptoms of a diminished sense of personal accomplishment (MBI-HSS) or reduced academic efficiency (MBI-SS) ranged between 17% and 34.3% and between 14% and 25.3%.

Discussion

This study aimed to describe the prevalence of burnout and its three dimensions in undergraduate dental students through a systematic literature review.

The significant variability in the prevalence of burnout syndrome and its dimensions observed in this review is caused by the diversity of the studies included: they were conducted in universities in different countries, with different curricula, and students with diverse personal, educational, and sociocultural characteristics. However, despite this high variability, all the studies reviewed agree that burnout is a real problem in dental school training.

Addressing this issue is important because there is evidence that depression and burnout are related. The studies conducted by Galán et al. ⁽⁹⁾ and

Deeb et al. ⁽¹¹⁾ report an association between burnout and depression, where depression is more frequent in students with burnout. Campos JA. et al. ⁽⁵⁾ also found an association between burnout and poorer academic performance, higher frequency of medication use, and considering dropping out of school. They state that the nature of the cross-sectional design of their studies means that the associations found should be interpreted with caution since it does not allow them to determine the directionality of the relationship detected.

The literature finds higher levels of burnout in students who live alone. In this regard, Atalayin C et al. ⁽¹²⁾ found that academic inefficiency was more prevalent in students living far from their families. When students live with their families, they provide significant social support in managing stress and burnout. Humphris et al. ⁽¹⁵⁾ found lower stress levels in first-year students living with their families, while Eren H et al. ⁽¹⁷⁾ identified lower levels of emotional exhaustion in students living with their families.

Table 1: Summary of the descriptive characteristics of studies using the MBI-HSS to measure burnout

Author (year)	Population	Demographic characteristics	Prevalence of burnout	Prevalence of burnout dimensions
Deeb et al. (2017) ⁽¹¹⁾	n=119, undergraduate dental students, third and fourth year. School of Dentistry, Virginia Commonwealth University (USA)	56% women Average age: 27.8 (SD 3.7)	40%	MBI-EE: 34% MBI-DP: 17% MBI-PA: 22%
Mache et al. (2015) ⁽¹⁶⁾	n=239, undergraduate dental students. Charité University, Universitaetsmedizin Berlin (Germany)	64% women Average age: 23 (SD 4.47)	NR	MBI-EE: 38% MBI-DP: 11% MBI-PA: 17%
Galán et al. (2014) ⁽⁹⁾	n=208, second, fourth and fifth-year undergraduate dental students. School of Dentistry, Seville (Spain)	68.7% women Average age: 21.8 (SD 3.8)	Fourth year: 50.9% Fifth year: 25.6%	Fourth year: MBI-EE: 49.1% MBI-DP: 12.7% MBI-PA: 50.9% Fifth year: MBI-EE: 19.2% MBI-DP: 14.1% MBI-PA: 33.3%
Prinz et al. (2012) ⁽¹⁴⁾	n=109, fourth and fifth-year undergraduate dental students. Friedrich-Alexander University (Germany)	50.4% women Average age not reported	NR	MBI-EE: 37.7% MBI-DP: 29.8% MBI-PA: 34.3%
Pöhlmann et al. (2005) ⁽¹³⁾	n=161, fourth and fifth-year undergraduate dental students. Universities of Dresde, Freiburg, and Bern (Germany and Sweden)	48% women Average age: Dresde: 24.4 (DS 2.4) Freiburg 26 (SD 2.4) Bern 26 (SD 4.0)	NR	MBI-EE: 10% MBI-DP: 28% MBI-PA: 17%
Humphris et al. (2002) ⁽¹⁵⁾	n=331, first-year undergraduate dental students. 49% women Average age not reported 49% women Average age not reported Dental schools from Amsterdam, Belfast, Cork, Greifswald, Helsinki, Liverpool and Manchester (Netherlands, Northern Ireland, Ireland, Germany, Finland, and England)	49% women Average age not reported	NR	MBI-EE: 22%

NR: Not reported; MBI-HSS: Maslach Burnout Inventory – Human Services Survey; MBI-EE: Emotional exhaustion; MBI-DP: Depersonalization; MBI-PA: Diminished sense of personal accomplishment.

Table 2: Summary of the descriptive characteristics of studies using the MBI-SS to measure burnout

Author (year)	Population	Demographic characteristics	Prevalence of burnout	Prevalence of burnout dimensions
Jimenez et al. (2019) ⁽¹⁰⁾	n=73; undergraduate dental students, third semester. Private university, Mexico	65% women Average age: 19.7	17,8%	MBI-EX: 52%
Eren et al. (2016) ⁽¹⁷⁾	n=458, first to fifth-year undergraduate dental students. School of Dentistry, University of Ankara (Turkey)	33.4% women Average age not reported	26%	MBI-EX:25% MBI-CY:18% MBI-EF:14%;
Atalayin et al. (2015) ⁽¹²⁾	n=329, undergraduate dental students in the first, second, and third years. School of Dentistry, Ege University (Turkey)	50.5% women Average age 21.32 (SD 1.43)	NR	MBI-EX:22,3% MBI-CY:16,7% MBI-EF: 17,9%
Mafla et al. (2014) ⁽⁸⁾	n=5647, undergraduate dental students. In 17 dental schools in Colombia	70% women Average age not reported	7%	NR
Galán et al. (2014) ⁽⁹⁾	n=208, second, fourth and fifth-year undergraduate dental students. School of Dentistry, Seville (Spain)	68.7% women Average age: 21.8 (SD 3.8)	Second year: 41.3%	2do año: MBI-EX:37,3% MBI-CY:17,3% MBI-EF:25,3%
Campos et al. (2012) ⁽⁵⁾	n=235, first to fourth-year undergraduate dental students. School of Dentistry of Araraquara, UNESP (Brazil)	72.8% women Average age: 21.0 (SD 1.8)	17%	NR

NR: Not reported; MBI-SS: Maslach Burnout Inventory – Student Survey; MBI-EX: Exhaustion; MBI-CY: Cynicism; MBI-EF: Reduction in academic efficiency

Regarding sex differences and burnout, several studies reviewed did not identify significant differences by sex ^(5,9-11,15). However, some authors identified significantly higher scores for emotional exhaustion in women ^(12,16,17) when analyzing sex differences in burnout cases. In turn, men presented considerably higher levels of depersonalization ⁽¹⁶⁾, which could be due to gender

differences in how burnout manifests.

Regarding emotional exhaustion (MBI-EE), prevalence rates ranged between 10 and 49.1% (MBI-HSS), and between 22.3% and 52% (MBI-SS). The evidence shown by Prinz P et al.⁽¹⁴⁾ and Galán F et al.⁽⁹⁾ in fourth and fifth-year dental students shows that emotional exhaustion symptoms are more significant at the beginning

of the clinical practice experience (fourth year), which seems to cause psychosocial stress. The authors suggest the importance of establishing psychological and psychosocial support mechanisms to ease the transition and provide tools for coping with the challenges of clinical practice⁽¹⁴⁾. This could also be explained by the more significant academic burden carried by fourth-year students since, in general, theoretical content teaching decreases in fifth year⁽⁹⁾.

Atalayin et al.⁽¹²⁾ evaluated the presence of emotional exhaustion in first to third-year dental students. They found that third-year students had the highest levels of emotional exhaustion, probably due to the stress accumulated in the previous years. Similarly, the study by Jimenez-Ortiz et al.⁽¹⁰⁾ conducted among third-year students shows that 50% are emotionally exhausted, although all participants report experiencing some emotional fatigue. This is the most frequent response to exposure to stressful environments. This shows the importance of addressing and preventing burnout in students in pre-clinical activities before they start the clinical courses⁽¹²⁾.

Additionally, Campos J et al.⁽⁵⁾ analyzed first to fourth-year dental students and observed that the highest levels of emotional exhaustion were found in first-year students. This was probably due to the transition and adaptation from secondary to higher education, which requires higher autonomy and responsibility over their studies. Humphris G et al.⁽¹⁵⁾ report a 22% prevalence of emotional exhaustion in first-year dental students at seven European universities. However, the analysis conducted by dental school identified that students had lower levels of emotional overload were they are in contact with patients from the beginning of their training. This could indicate that a curricular change that allow for early student interaction with patients could have a positive impact as it prepares students to cope with social interaction with patients.

Therefore, emotional exhaustion seems to be related more to high academic demand, that is, to

study conditions related to work overload and assessment^(9,12,13,15) and the student's stress or anxiety when facing, for instance, the transition from pre-clinical to clinical activities^(9,14). Additionally, Póhlmann et al.⁽¹³⁾ identified the lack of recreational activities as the main predictor of emotional exhaustion in fourth- and fifth-year students. In the same way, Marche et al.⁽¹⁶⁾ identified lower levels of emotional exhaustion in students who engaged in healthy activities such as physical exercise, relaxation activities, or meeting with friends.

Regarding depersonalization or cynicism, the prevalence reported varied between 11 and 29.8%, and 16.7% and 18% as measured with the MBI HSS and MBI-SS questionnaires, respectively. Eren et al.⁽¹⁷⁾ identified that cynicism increases as students progress in their degrees; the highest levels are found in students in the clinical practice stage. Depersonalization or cynicism in burnout have a significant impact since they are related to the attitude that future dentists will have toward patient care. This typically entails an emotional disconnection from the needs of others⁽¹⁴⁾. Depersonalization may reflect students' insecurity about how to deal with patient care. Therefore, developing social skills should be a fundamental pillar in the dental surgeon's clinical curriculum as they will prepare students to deal with the social side of patient care⁽¹³⁾. Póhlmann et al.⁽¹³⁾ identified a lack of social integration as a predictor of depersonalization, so the authors suggest strengthening the development of competencies in communication skills to help reduce depersonalization symptoms in students. Marche et al.⁽¹⁶⁾ studied a sample of dental students at a university in Berlin who engaged in positive relaxation activities and found that they had lower levels of depersonalization. They also found that those who engaged in negative relaxation activities (drug or alcohol use) had more depersonalization symptoms. This highlights the importance of promoting healthy coping strategies to prevent student burnout^(11,16).

Regarding a diminished sense of personal ac-

complishment and or academic efficiency, a prevalence of between 17% and 34.3% and between 14% and 25.3% was observed as measured with the MBI-HSS and MBI-SS questionnaires. A diminished sense of personal accomplishment in dental students appears to be the most frequent burnout dimension in dental students in clinical practice ^(9,14). However, there is also evidence of high levels in first-year students. Atalayin et al. ⁽¹²⁾ determined that reduced academic efficiency is significantly higher in first-year pre-clinical students than third-year pre-clinical students. This is probably because learning pre-clinical procedures is more complex for beginner students. Similar results were observed by Eren et al. ⁽¹⁷⁾ in first to fifth-year dental students. They found that reduced academic efficiency is higher in first-year students. Atalayin et al. ⁽¹²⁾ identified that the reduction in academic efficiency has a direct effect on students' academic satisfaction, academic achievement, and their desire to per-

severe and continue with their studies until graduation. The feeling of personal accomplishment and/or the feeling of being academically effective is essential since the lack of personal accomplishment may reflect an imbalance between the efforts to advance their studies and the sense of reward ⁽⁵⁾.

The qualitative analysis of the articles in this review indicates that it is necessary to diagnose burnout-related symptoms early to address this problem. This would allow trainers to provide students with coping tools such as teaching stress management techniques, and promoting self-care and psychological well-being. Reducing student burnout in students could positively impact their academic performance, health and quality of life. It could also improve the quality of patient care delivery, since there is a link between burnout and its negative effect on the performance of health professionals performance and patient care ⁽¹⁾.

Conclusions

The articles analyzed in this systematic review present a high variability, as they consider students from different countries and sociocultural characteristics, attending universities with different curricula and in different stages of their studies. However, all agree that burnout during dental undergraduate training is a real problem that needs to be addressed. The articles recommend improving undergraduate dental training to reduce burnout prevalence, such as avoiding the academic overload of students, allowing early student-patient interaction, providing psychosocial support in the transition from pre-clinical activities to clinical practice, developing competencies in social and communication skills and providing coping tools, such as teaching stress management techniques, and promoting self-care and psychological well-being during student training.

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Authorship contribution

1. Conception and design of study
2. Acquisition of data
3. Data analysis
4. Discussion of results
5. Drafting of the manuscript
6. Approval of the final version of the manuscript.

KPL has contributed in: 1, 2, 3, 4, 5, 6.

CGU ha contribuido en: 1, 2, 3, 4, 5, 6.

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