



Consequences of Occupational Stress in Orthodontists - A Scoping Review

Prasad Mandava^{1*}, Anisha Mishra², Mandava Sai Snigdha³, Ramachandran Saravanan⁴, Ramachandra Prabhakar⁵, Jitendra Sharan⁶

¹*PhD Scholar, Department of Orthodontics, Dr. M.G.R. Educational and Research Institute, Periyar E.V.R. High Road, Vishwas Nagar, Maduravoyal, Chennai, Tamil Nadu, India

²Department of Dentistry, All India Institute of Medical Sciences, Bhubaneswar, India

³Junior Resident, Narayana Medical College, India

⁴Professor, University Faculty, Dr. M.G.R. Educational and Research Institute, Chennai, India

⁵Supervisor, Dr. M.G.R. Educational and Research Institute, Chennai, India

⁶Department of Dentistry, All India Institute of Medical Sciences, Bhubaneswar, India

*Corresponding Author:

Dr. Prasad Mandava

PhD Scholar, Department of Orthodontics, Dr. M.G.R. Educational and Research Institute, Periyar E.V.R. High Road, Vishwas Nagar, Maduravoyal, Chennai, Tamil Nadu, India

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KEYWORDS

Burnout, communication skills, occupational stress, orthodontists, work-life balance

ABSTRACT:

Introduction: To assess the difference in the occupational stress intensity and consequences among orthodontists in different geographical regions. This scoping review aims to detect and summarise the consequences of occupational stress on clinical orthodontists.

Methods: A detailed search was conducted in PubMed, ProQuest, EMBASE, and Ovid databases for articles until July 2024. The search strategy was developed using a combination of appropriate Medical Subject Headings (MeSH) terms coupled with Boolean operators (AND, OR) and adapted for the respective databases. Three independent reviewers (A.M, P.M., J.S.) performed title, abstract, and full-text assessment. Any disagreement was resolved by three senior reviewers.

Results: A total of 3549 studies were selected after an initial electronic database search, of which 258 duplicates were eliminated. Only 11 studies were found eligible for full text assessment from the 3291 article titles and abstracts. The nature of the workplace (urban/rural) was also under-reported. The predominant professional practice years ranged from less than 3 years to 10-20 years, with an average of 31.35 work hours per week. Lack of patient compliance and time-related stressors were significantly the most stressful, whereas referral and income-related stressors were significantly the least stressful. Another underreported aspect of these studies was stress indicators and overall job satisfaction.

Conclusions: Improving the patient communication and time management skills, along with maintaining a good work-life balance, aided in the management of overall stress.

Introduction

Stress, as described by Atkinson *et al.*, is the physical or mental external demands on an individual's physical and psychological well-being.^[1] Mackay *et al.* termed it as 'a

stimulus, a response, or the results of an interaction between the two, with the interaction described in terms of some imbalance between the person and the environment.^[2] According to a British Dental Association survey, dentists experience anxiety, fear,



and stress in daily clinical practice scenarios, accounting for almost 57.1% of community dentists and 72.9% of general dentists.^[3]

From the beginning of dental school^[4], post graduation^[5,6], and till specialised clinical practice, dentists encounter various types of stresses from many sources. Although some stress is desirable to prevent understimulation, boredom, or monotony, continuous stress from various sources can result in mental and physical disturbance and may also lead to substance abuse, which in turn diminishes work and learning efficiency.^[4] A systematic review on surgeons also states that their technical and non-technical skills and performances are hampered due to excessive intraoperative stresses.^[7] Literature evidence in the healthcare field also shows the negative consequences of stress on memory^[8,9], diagnostic^[10,11] and communication skills^[12], performance during critical events^[13,14], psychomotor movements^[16] and cardiovascular changes.^[16] Similarly, dentists experiencing various intra- and perioperative stresses from stressors of various sources can, in turn, have a negative impact on their clinical performance and patient safety.^[17] Dentists form the top tier in the most stressful health professions^[18] and due to the occupational stresses along with musculoskeletal disorders, most dentists opt for premature retirement.^[19] Additionally, healthcare workers, due to chronic forms of stress, face a state of burnout. It is a form of emotional distress syndrome which consists of emotional exhaustion, depersonalisation, and reduced personal accomplishment.^[20]

Literature evidence shows many studies conducted in various dental schools across the world using various available surveys such as the Dental Environment Stress Questionnaire^[21,22,23], State-Trait Anxiety Inventory, Beck Depression Inventory^[24,25], Maslach Burnout Inventory, etc. ^[18,19], all stating the increase in stress in dentists.

Orthodontists in particular have a long-standing patient relationship which lasts for a couple of years and long working hours in each session until the conclusion of the desired treatment, which often leads to undiagnosed stresses if not recognised early, can/lead to depression and other physical and mental disturbances.^[26] Studies on orthodontists from various parts of the globe show

stresses due to patient dissatisfaction, adult uncooperative patients, patients with broken appliances and broken or delayed appointments, or cases with poor prognosis.^[27,28,29]

During speciality training, domains such as curriculum structure, clinical proficiencies, relations and protocols with patients, conducive working environment, job satisfaction add as stressors for the students to cope with. As a result of this, clinical orthodontists often lead a stressful life, often needing medical therapeutic interventions.^[26,30] As many articles already exist on the influence of stresses on orthodontic residents in various parts of the globe, this scoping review aims to detect and summarise the consequences of occupational stresses on clinical orthodontists.

Materials and Methods

The current study was reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR).^[31] The five-stage approach for scoping reviews by Arkey and O'Malley, which includes identifying the research question, searching for relevant studies, the study selection, charting the data, and collating, summarizing, and reporting the results, provided the framework for this research paper.^[32]

Research question

Is there a difference in the occupational stress intensity and consequences among orthodontists in different geographical regions?

Does occupational stress have any consequences on the overall performance of orthodontists?

The research question was formulated as PECO (P – Population, E - Exposure, C – Comparison, O – Outcome).

P: Orthodontists

E: Stress, pressure, tension, fear, anxiety, emotions, worry, concern

C: No stress, pressure, tension, fear, anxiety, emotions, worry, or concern

O: Decision making, diagnosis, treatment planning, performance, clinical performance, clinical competence, psychomotor performance and communication skills,



cognitive ability, and adherence to guidelines and recommendations

Articles search process

A detailed search was done in PubMed, ProQuest, EMBASE, and Ovid databases for articles until July 2024. The search strategy was developed using a combination of appropriate Medical Subject Headings (MeSH) terms coupled with Boolean operators (AND, OR) and adapted for the respective databases (Table S1). Articles were identified and duplicates were eliminated using the Zotero software (Zotero 5.0 for Windows; Centre for History and New Media, George Mason University, Fairfax, VA, USA). Three independent reviewers (A.M, P.M, J.S) performed title, abstract, and full-text assessment. Any disagreement was resolved by three senior reviewers (R.P, R.S, E.A).

Eligibility criteria

Inclusion criteria:

Experimental and observational prospective comparative studies, randomised and non-randomised studies published in English, assessing the levels of occupational stress in Orthodontists were included.

Exclusion criteria:

Non-empirical studies, opinion pieces, narrative reviews, book chapters, conference abstracts published in any other language were excluded. Studies assessing the stress levels in general dentists or orthodontic postgraduate students were also eliminated.

Article selection and data extraction process

Study titles and abstracts were analysed according to the set inclusion and exclusion criteria, and duplicates were removed. Final compilation and extraction were done for the articles fulfilling the inclusion criteria, subsequent to full text reading. A pre-piloted data extraction spreadsheet was designed in Microsoft Excel 2016 (Microsoft Corp., Redmond, WA, USA). Three reviewers extracted the following data: primary author, publication year, journal, country, study design, study sample, sample size, predominant age group, predominant marital status, nature of workplace, predominant professional practice years, hours into professional practice, nature of practice, work days in a week, survey tool, affected population, statistically significant stressors, stress indicators, management of stress and job satisfaction; which was further verified by three senior team members. (Table 1).

Database	Search terms	Results
	((("stress"[All Fields] OR "stressed"[All Fields] OR "stresses"[All Fields] OR "stressful"[All Fields] OR "stressfulness"[All Fields] OR "stressing"[All Fields] OR "occupational stress"[All Fields] OR "job stress"[All Fields] OR "professional stress"[All Fields] OR ("anxiety"[MeSH Terms] OR "anxiety"[All Fields] OR "anxieties"[All Fields] OR "anxiety s"[All Fields]) OR ("emoting"[All Fields] OR "emotion s"[All Fields] OR "emotions"[MeSH Terms] OR "emotions"[All Fields] OR "emotion"[All Fields] OR "emotional"[All Fields] OR "emotive"[All Fields]) OR ("fear"[MeSH Terms] OR "fear"[All Fields])) AND ("orthodontist s"[All Fields] OR "orthodontists"[MeSH Terms] OR "orthodontists"[All Fields] OR "orthodontist"[All Fields])) NOT (("post"[All Fields] AND ("graduate"[All Fields] OR "graduate s"[All Fields] OR "graduated"[All Fields] OR "graduates"[All Fields] OR "graduating"[All Fields] OR "graduation"[All Fields] OR "graduations"[All Fields])) OR ("internship and residency"[MeSH Terms] OR ("internship"[All Fields] AND "residency"[All Fields]) OR "internship and residency"[All Fields] OR "residencies"[All Fields] OR "residency"[All Fields] OR "reside"[All Fields] OR "resided"[All Fields] OR "residence"[All Fields] OR "residence s"[All Fields] OR "residences"[All Fields] OR "residency s"[All Fields] OR "resident"[All Fields] OR "resident s"[All Fields] OR "residents"[All Fields] OR "resides"[All Fields] OR "residing"[All Fields]) OR ("student s"[All Fields] OR "students"[MeSH Terms] OR "students"[All Fields] OR "student"[All Fields] OR "students s"[All Fields]) OR ("trainee"[All Fields] OR "trainee s"[All Fields] OR "trainees"[All Fields]))	



Pubmed		326
ProQuest	((((((((stress) OR ("occupational stress")) OR ("job stress")) OR ("professional stress")) OR (anxiety)) OR (emotion) OR (fear)) AND (orthodontist)) NOT (((post graduate) OR (resident)) OR (student)) OR (trainee))	1832
EMBASE	('stress'/exp OR stress OR '"occupational stress"' OR ("occupational AND stress")) OR '"job stress"' OR ("job AND stress")) OR '"professional stress"' OR ("professional AND stress")) OR 'anxiety'/exp OR anxiety OR 'emotion'/exp OR emotion OR 'fear'/exp OR fear) AND ('orthodontist'/exp OR orthodontist) NOT ('post graduate' OR (post AND ('graduate'/exp OR graduate))) OR 'resident'/exp OR resident OR 'student'/exp OR student OR 'trainee'/exp OR trainee)	521
Ovid	(AllFields:(AllFields:((((((((stress) OR ("occupational stress")) OR ("job stress")) OR ("professional stress")) OR (anxiety)) OR (emotion)) OR (fear)) AND (orthodontist)) NOT (((post graduate) OR (resident)) OR (student)) OR (trainee))))	870

((((((((stress) OR ("occupational stress")) OR ("job stress")) OR ("professional stress")) OR (anxiety)) OR (emotion)) OR (fear)) AND (orthodontist)) NOT (((post graduate) OR (resident)) OR (student)) OR (trainee))

Results

PRISMA guidelines^[33] were followed for the literature search process (Figure 1). A total of 3549 studies were selected after an initial electronic database search, of which 258 duplicates were eliminated. Only 11 studies were found eligible for full text assessment from the 3291 article titles and abstracts. Two studies were eliminated as they were interview-based research^[34,35] and finally, a total of 9 studies were included in this scoping review.

The included studies comprised orthodontists from various parts of the world, including Canada^[30,36], Morocco^[37], Italy^[38,39], Australia^[40], Nigeria^[41], Saudi Arabia^[42] and India^[43]. The nine studies comprised a total of 1920 orthodontists, out of which 1115 (58%) were males. The average age ranged from 31-40 years, with marital status being mentioned only by two studies.^[43,38] The nature of the workplace (urban/rural) was also under-reported. The predominant professional practice years ranged from less than 3 years to 10-20 years, with an average of 31.35 work hours per week. Only three studies^[41,42,43] reported an average of 4.5 work days in a week, with the nature of practice

being varied from self-employed, private corporate practice to teaching in a hospital and a combination of the above.

The most common survey tool to measure orthodontists' occupational stress was the occupational stress assessment questionnaire based on a 5-point Likert scale. Physical aspect of stress was also measured by two studies.^[39,40] By placing a 24-hour automatic device to monitor blood pressure and heart rate, in turn measuring the myocardial oxygen consumption (MVO₂) and by using a modified version of standardised Nordic musculoskeletal questionnaires, respectively. Pirillo *et al*^[38] assessed the orthodontists' burnout by Maslach Burnout Inventory, which comprises Emotional Exhaustion (EE), Depersonalisation (DP), and Personal Accomplishment (PA). Lack of patient compliance and time-related stressors were significantly the most stressful, whereas referral and income-related stressors were significantly the least stressful. Another underreported aspect of these studies were stress indicators and overall job satisfaction. Overall, patient and time management skills along with maintaining personal social activities, aided in the management of overall stress.

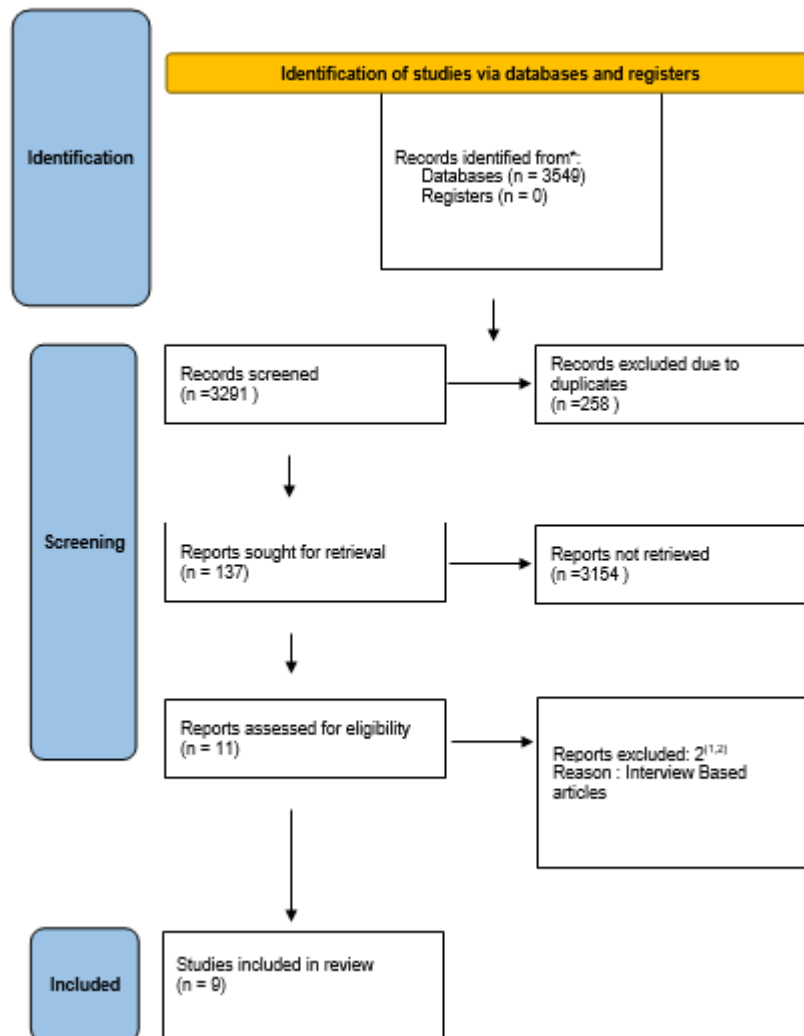


Figure 1: PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only

Discussion

To the best of our knowledge, this is the first scoping review on the consequences of occupational stress in orthodontists. Many studies have been published on the effects of stress on dentists in general or undergraduate dental students, however, analysis of stress in orthodontists is also equally important because it is the only field in dentistry where the treatment procedure and patient relationship last anywhere between 1-5 years. Orthodontists are thus exposed to cumulative stressors and unfortunately fall victim to its undesirable consequences, such as absenteeism, decreased productivity, burnout, and work discontent.^[44] Hence, it becomes vital to identify these stressors in their initial

phases to aid in efficient stress management behaviours to increase treatment outcomes and job satisfaction.

Cooper *et al* stated that unattained amounts of stress can even lead to mental illnesses such as anxiety, depression along with somatic complaints which also cumulatively act as stressors themselves.^[45]

The present study is a compilation and analysis of 9 studies which satisfied our inclusion criteria. A slight male orthodontist's predominance (58%) was seen in the included studies. The present study also saw an increase in occupational stress amongst unmarried males in the age group of 30- 40 years. It is however interesting to note that many studies amongst undergraduate dental students show an increase in stress



amongst females during the preclinical years, where the sources of stress included lack of confidence in clinical decision making and an overall self-doubt of being a successful dentist.^[46] During the clinical years of undergraduate training, male students were more affected.^[47]

Pirillo *et al*^[38] reported that in relation to EE, males and females were equally affected which lowered up to 40 years and increased up to 60 years. The most exposed were married and separated, with the highest EE faced by self-employed males. Self-employed women were seen to be least affected by DP in contrast to married and separated males. DP was seen to decrease after ten years of marriage. Males and females showed no difference in PA with it lowering up to 40 years. However, it peaked in women working more than 50 hours a week in complete contrast to men. An increase in education and years in healthcare showed an overall decreased EE, DP and PA.

The majority of the included studies defined patient and time-related management as the most significant stressors. This stems from the urge to deliver quality health care services consistently, thereby increasing unprecedented strain, which negatively affects the doctor's productivity and well-being.^[48] It has been noted that there is a positive correlation between exposure to psychosocial stress and work-related illnesses.^[49] An interesting study amongst the European Union Member nations from 2000 to 2005 stated that almost 22% of the workers were affected by psychosocial stress, which resulted in a loss of 60% of the working days, which in turn amounted to a 4% gross national product loss.^[50]

Stress also resulted in high musculoskeletal problems in areas such as back, neck, and shoulder pain, and relatively lower rates in hand/wrists, hips/ thighs, and elbows.^[51,52,53] Hence, for maintenance of good health and function, incorporation of “ergodontics” that is performing ergonomic dentistry, including rest breaks and physical exercise, is of prime importance, as it has been previously noted that 30% of dentists fail to take a break during their clinical hours.^[54,55,56]

Spending time with family and friends, physical exercises, meditation, social media, hobbies, and attending stress management programs are a few

popular methods to alleviate stress amongst orthodontists.^[43]

Conclusion

Income, patients, time, employees, job-related, health, personal life, and professional work were the eight domains into which potential stressors were categorized. Job satisfaction scores are a reflection of the orthodontist's attitude toward their work. The majority of orthodontists expressed satisfaction with their employment and stated that, if given the chance, they would pursue a career in orthodontics. For both residents and orthodontists, a healthy work-life balance is essential to professional happiness. To get a high level of job satisfaction in their careers, orthodontists must be aware of all the different stressors that are present in their daily practice from the start and focus on a good work-life balance.

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Conflicts of interest

There are no conflicts of interest.

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