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Stress and anxiety in orthodontic residents during the coronavirus disease 2019 pandemic

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Introduction: The coronavirus disease 2019 pandemic has had far-reaching effects on health care providers and health professional students; however, little is known about the factors related to stress and anxiety levels, specifically among orthodontic residents during this time. **Methods:** A 2-part questionnaire, which included modified stress and anxiety inventories, was disseminated electronically to U.S. orthodontic residents between June and July 2020. Descriptive and comparative statistics were used to analyze the data. **Results:** Overall, 261 participants responded (56% female), representing a response rate of 26.8%. Significant gender differences were found in 18 stress items, with female respondents expressing more stress than their male counterparts. Only 1 stress item (ie, fear of being unable to catch up if behind) varied as a function of the difference on the basis of respondents' stage in the program. First-year residents reported more stress in relation to this than more senior residents. Responses to all anxiety items but 1 item varied by gender, with females reporting higher scores. Residents in the middle stages of their program responded with higher anxiety scores with significant differences on 3 anxiety items. **Conclusions:** Although financial responsibilities and travel plans were the most stressful and anxiety-inducing items for orthodontic residents during the early aspect of the coronavirus disease 2019 pandemic, multiple items contributed to their stress and anxiety. In addition, both gender and stage of progress in a residency program impacted the level of stress and anxiety reported by respondents. (*Am J Orthod Dentofacial Orthop* 2022;162:e35-e43)

There has been a growing interest in burnout among health care providers and health professional students in the United States and across the world.¹⁻¹¹ Burnout is associated with stress, inefficient work processes, and barriers to achieving meaning in one's work.^{1-4,12} Concerns and studies related to health care worker burnout originated from the medical specialty. Although physician burnout varies by specialty, the average rate of physician burnout is higher than the

general population, with an increasing trend over time.^{13,14} Other health professions soon followed suit in studying how stress and burnout present among their cohorts, including students and residents.^{10,11,15} Stress levels among dental students are higher than medical students¹⁶; however, it is challenging to compare dental residents to medical residents, primarily because of the scarcity of data relative to dental residents. Depending on their stage in the curriculum, stress among dental students is associated with academic factors, clinical factors, inconsistent faculty feedback, assigned workload, performance pressure, and self-efficacy beliefs.^{17,18} Levels of anxiety among dental students have also been high.^{19,20} Within the field of orthodontics, specifically, factors impacting the stress and anxiety of residents have not been well-studied.

In the early months of 2020, the coronavirus disease 2019 (COVID-19) pandemic created a significant global impact. In the United States, most people experienced mandated lockdowns, making them unable to interact with anyone other than those they lived. This isolation worked to increase stress among the general public.²¹ Primary and secondary education quickly transferred

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to online modalities, and those with young children had to adapt. As more became known about the emerging severe acute respiratory syndrome coronavirus 2 virus, some essential segments of society reopened, including health care. Personal protective equipment (PPE) was in short supply, and during the first 6 months of the pandemic, dental professionals were thought to be at very high risk of occupational exposure²² because of the aerosols generated during treatment. Residents and students were unsure if they would be able to attain the clinical experiences needed to complete their training on time or with confidence. Influenced by the university, dental board, and governmental recommendations, the guidance to the specialty continued to shift, as did the availability of PPE and the willingness of patients to present for treatment. This required constant adaptation and flexibility. This multitude of pandemic-associated factors appeared to magnify the amount of stress and anxiety experienced by dental students and residents, including orthodontic residents. Stress, anxiety, and burnout among health care providers are associated with decreased productivity, increased errors, and poorer quality of care for patients. However, no studies have sought to elucidate the impact of the COVID-19 pandemic on the levels of stress and anxiety experienced by orthodontic residents in the United States.

Therefore, this study aimed to gauge the factors that impacted the stress and anxiety of North American orthodontic residents during the early months of the COVID-19 pandemic.

MATERIAL AND METHODS

Residents enrolled in North American postgraduate orthodontic programs in June 2020 were invited to participate in this study. An online questionnaire was constructed using Qualtrics software (Qualtrics, Provo, Utah); Institutional Review Board approval (IRB-FY2020-4497) was obtained from New York University. The questionnaire was distributed via e-mail to North American orthodontic residents through the American Association of Orthodontics Partners in Research Program. The questionnaire was also posted to the American Association of Orthodontics Residents Champion Facebook (Meta Platforms, Inc, Menlo Park, Calif) page. The questionnaire was administered from June 2020 to July 2020, with 2 reminders sent at 4 and 6 weeks. Informed consent was obtained from the respondents; participation was voluntary and anonymous. Because there was no data on orthodontic residents using a similar survey instrument before the COVID-19 pandemic at the study, the

questionnaire specifically stated that participants were asked to “Participate in a survey to assess your feelings about the impact of the novel coronavirus that causes COVID-19.” In addition, survey questions were prefaced with the following statement, “In response to the COVID-19 pandemic, please indicate the degree to which you experience stress from each of the items listed below as part of your orthodontic education experience.” The questionnaire included demographic data on gender and stage in the program. Because of the variability in the duration of orthodontic programs, the stages in the program were classified as first year, midway, and final year. Two sets of measures were used to assess stress and anxiety.

The Dental Environmental Stress Questionnaire (DESQ), a validated 38-item instrument,²³ was modified to be more orthodontic-specific. Survey modifications included removing some items and adding 2 new items to assess the impact of perceived discrimination on stress. The final modified DESQ used for this study contained 37 items broken down into 10 categories: self-efficacy beliefs, faculty and administration, workload, patient treatment, clinical training, performance pressure, personal relationships, personal life, professional life, and discrimination. Residents were asked to assess each item as not stressful, slightly stressful, moderately stressful, or very stressful. Respondents rated the 37 items on a 4-point Likert scale (1, not stressful; 2, slightly stressful; 3, moderately stressful; and 4, very stressful). An additional option (0, not pertinent) was given for items that did not apply to the respondent. The scale was modified from the original DESQ, which scored the items 0-3 and did not include a not pertinent response option (Table 1).

Anxiety was assessed using a 9-item instrument adapted from a published questionnaire²⁴ used to measure self-reported anxiety during the 2009-2010 H1N1 swine flu pandemic. The “swine flu” was changed to “COVID-19.” Respondents rated each item on a 4-point Likert scale (1, very little; 2, somewhat; 3, a lot; and 4, very much). The questions were sequenced randomly to minimize response bias (Table II).

To compose a summary measure for the stress items (total stress score), we determined the internal consistency for the 26 stress items, with at least 200 responses not including nonpertinent. Cronbach alpha was 0.93, which is excellent. The summary measure for the anxiety scale (total anxiety score) included all items. Cronbach alpha was 0.84, which is good.²⁵

The data were analyzed using descriptive statistics. Gender differences were evaluated with the Mann-

Table I. DESQ for orthodontic residents

Category	Items
Self-efficacy beliefs	Lack of confidence to be a successful orthodontic resident
	Lack of confidence in self to be a successful orthodontist
	Completing graduation requirements
Faculty and administration	Fear of failing a course or year
	Receiving criticism about work
	Atmosphere created by the faculty
	Rules and regulations of the program
	Amount of cheating in program
	Expectations of the program and what, in reality, it is like
	Lack of input into the decision-making process of the program
Workload	Inconsistency of feedback on work between different instructors
	Amount of assigned classwork
	Difficulty of classwork
	Lack of time to do assigned work
Patient treatment	Lack of time for relaxation
	Fear of being unable to catch up if behind
	Responsibilities of comprehensive patient care
Clinical training	Patients being late or not showing for their appointments
	Working on patients with dirty mouths
Performance pressure	Difficulty in learning clinical procedures
	Difficulty in learning precision manual skills
Personal relationships	Examinations and grades
	Competition for grades
	Relationships with members of the opposite gender
	Martial or relationship adjustment problems
Personal life	Forced postponement of marriage or engagement
	Having children at home
	Necessity to postpone having children
	Conflict with a partner over career decisions
	Having the dual role of wife/mother or husband/father and orthodontic resident
Professional life	Personal physical health
	Financial responsibilities
Discrimination	Lack of home atmosphere in living quarters
	Insecurity concerning professional future
Discrimination	Considering entering some other field of work
	The attitude of the school toward female dental students
Discrimination	Discrimination because of race, class status, ethnicity, or other minority groups

Whitney U test and program stage differences with the Kruskal-Wallis test. Total stress and anxiety score differences were evaluated using a 1-way analysis of variance. All analyses were completed using IBM SPSS (version 28; IBM Corp, Armonk, NY). Statistical significance was set at $P < 0.05$.

Table II. COVID-19 anxiety items

1. To what extent are you concerned about COVID-19?
2. To what extent do you believe COVID-19 will have lasting impacts on the world?
3. How likely is it that you could become infected with the novel coronavirus that causes COVID-19?
4. How likely is it that someone you know could become infected with the novel coronavirus that causes COVID-19?
5. How much exposure have you had to information about COVID-19?
6. If you did become infected with the novel coronavirus that causes COVID-19, to what extent are you concerned that you will become seriously ill?
7. To what extent has the threat of COVID-19 influenced your decisions to be around people?
8. To what extent has the threat of COVID-19 influenced your travel plans?
9. To what extent has the threat of COVID-19 influenced your use of safety behaviors (eg, hand sanitizer)?
Note. Adapted from the H1N1 anxiety survey. ²⁴

RESULTS

A total of 261 responses were received. Based on an estimated yearly enrollment of 975 orthodontic residents, the response rate was 26.8%. Most respondents were female (55.9%), and there were a similar number of respondents in each stage of the program. Summary demographics of the sample population, based on gender and stage of progress, are presented in [Table III](#).

Financial responsibilities were rated the most stressful of all factors assessed, with 63.9% ($n = 219$) of respondents rating it as moderately stressful or very stressful. Lack of input into the decision-making process of the program caused stress in 60.6% of the respondents. Several other items were ranked as moderately stressful or very stressful by the majority of respondents and included responsibilities of comprehensive care (58.3%), insecurity regarding professional future (57.5%), and difficulty learning clinical procedures (57.5%).

There were 7 items that few respondents considered moderately stressful or very stressful. These include, in ascending order, amount of cheating in the program (3.0%), relationships with members of the opposite gender (3.5%), conflict with a partner over career decisions (6.8%), the attitude of the school toward female dental students (9.1%), forced postponement of marriage or engagement (9.2%), and competition for grades (9.2%) ([Table IV](#)).

A total of 18 items (48.6%) showed statistically significant differences between genders ([Table IV](#)). In all subjects, female respondents reported more stress than their male counterparts.

Table III. Summary demographics of the sample population by gender and stage of progress with an overall response rate

Demographics	First year (37.9%)		Midway (27.2%)		Final year (34.9%)		Total	Overall response rate
	n	%	n	%	n	%	n	%
Male	35	35.35	31	43.66	43	47.25	109	26.8
Female	62	62.63	37	52.11	47	51.65	146	
Unspecified	2	2.02	3	4.23	1	1.10	6	
n	99		71		91		261	

Only 1 item (ie, fear of being unable to catch up if behind) varied as a function of the respondents' stage in the program. First-year residents reported more stress in relation to this item than more senior residents ($P < 0.0001$).

Respondents reported 3 items that caused a lot or very much anxiety: (1) To what extent has the threat of COVID-19 influenced your travel plans? (84.5%); (2) How much exposure have you had to information about COVID-19? (81.6%); and (3) To what extent has the threat of COVID-19 influenced your use of safety behaviors (eg, hand sanitizer)? (80.6%). The 3 lowest-ranked items were (1) If you did become infected with the novel coronavirus that causes COVID-19, to what extent are you concerned that you will become seriously ill? (20.0%); (2) How likely is it that you could become infected with the novel coronavirus that causes COVID-19? (39.2%); and (3) To what extent are you concerned about COVID-19? (46.5%) (Table V).

Responses to all items except 1 varied by gender, with females reporting higher scores (Tables V and VI).

There were significant differences on 3 items, with residents in the middle stages of their program responding with higher anxiety scores (Table V).

Total stress scores were higher in female vs male respondents but did not differ as a function of their stage in the program. Total anxiety scores were also higher in females than male respondents and higher in those at the beginning or end of the program than those in the middle (Table VI).

DISCUSSION

Even before the COVID-19 pandemic, stress and burnout among health care providers were a significant concern, as they impact retention in the workforce, medical errors, and patient outcomes. However, the specific factors impacting stress among orthodontic residents in North America have not previously been described. With the onset of the pandemic, stress, burnout, and anxiety among health care providers have increased.²⁶

This study demonstrated that the primary sources of stress when the survey was administered were related to

the following categories: clinical training, patient treatment, faculty and administration, and personal life. This is comparable to existing evidence on the stress levels in dental students and graduate students.¹⁷

For individual stress-provoking items, the highest-ranked item was financial responsibilities. In addition to the well-documented increasing cost of dental education, the high unemployment rate, a parallel spike in U.S. inflation rates, and the need to switch to online remote learning for school-aged kids may have compounded financial strains that orthodontic residents already experienced baseline. For financial reasons, many senior practicing clinicians decided to continue to practice rather than retire. Moreover, others were not in a financial position to hire new associates. These elements likely heightened orthodontic residents' stress associated with finances.

The second highest-ranked stress item was a lack of input into the decision-making process of the program. This reflects a top-down management approach in which department chairs, program directors, and administrative leadership make decisions without input or involvement from their constituents. Style of leadership and management are critical to setting the tone for an organization, and the top-down approach is now considered by many to be outdated. Today's students, residents, and workers expect to be viewed more as partners who have a say in decision-making. The top-down approach of many dental institutions, including orthodontic programs, may be a generational mismatch between outdated management philosophies and those viewed as more contemporary.

The remaining highest-ranking stress-provoking items were responsibilities of comprehensive patient care, insecurity concerning professional future, and difficulty in learning clinical procedures. It is not surprising that in a program that has a heavy clinical emphasis, residents would feel stressed about learning clinical procedures while clinics were closed, at limited capacity, or otherwise complicated by an amount of PPE that was not usual or comfortable to wear. In addition, in a job market with the uncertainty described earlier, it is understandable that respondents would feel

Table IV. Modified DESQ responses by gender and stage of progress in the program

Stress items	n	Distribution of replies, %					P values	
		1	2	3	4	Not pertinent	Gender	Stage in progress
Self-efficacy beliefs								
Lack of confidence to be a successful orthodontic resident	231	29.4	28.6	24.7	16.0	1.3	**	
Lack of confidence in self to be a successful orthodontist	231	26.4	29.0	25.5	17.7	1.3	**	
Completing graduation requirements	219	28.3	31.5	22.8	15.5	1.8		
Fear of failing course or year	218	69.7	12.4	5.0	4.6	8.3		
Receiving criticism about work	231	41.6	36.4	14.3	3.0	4.8	*	
Faculty and administration								
Atmosphere created by faculty	231	31.6	31.2	19.9	14.7	2.6	**	
Rules and regulations of the program	231	25.5	30.7	25.1	17.3	1.3		
Amount of cheating in program	231	63.6	4.3	2.2	0.9	29.0		
Expectations of the program and what, in reality, it is like	219	17.8	30.6	29.7	20.1	1.8	**	
Lack of input into the decision-making process of program	218	16.1	20.6	34.9	25.7	2.8	**	
Inconsistency of feedback on work between different instructors	219	25.1	31.1	25.1	10.5	8.2		
Workload								
Amount of assigned classwork	241	22.8	27.4	37.3	9.5	2.9		
Difficulty of classwork	241	29.5	35.7	28.2	3.7	2.9		
Lack of time to do assigned work	219	42.5	31.1	17.4	5.5	3.7	*	
Lack of time for relaxation	231	44.2	23.4	20.8	10.0	1.7	*	
Fear of being unable to catch up if behind	219	29.7	31.5	21.9	12.3	4.6	**	**
Patient treatment								
Responsibilities of comprehensive patient care	240	12.5	20.4	35.4	22.9	8.8		
Patients being late or not showing for their appointments	240	22.9	29.2	18.8	12.5	16.7		
Working on patients with dirty mouths	231	31.2	29.9	21.2	9.5	8.2	**	
Clinical training								
Difficulty in learning clinical procedures	240	12.9	21.7	38.3	19.2	7.9	*	
Difficulty in learning precision manual skills	231	21.2	33.3	23.8	13.9	7.8	**	
Performance pressure								
Examinations and grades	240	31.7	31.7	17.9	7.9	10.8		
Competition for grades	239	66.9	10.9	6.3	2.9	13.0		
Personal relationships								
Relationships with members of the opposite gender	231	79.7	12.1	1.3	2.2	4.8		
Martial or relationship adjustment problems	219	43.8	21.0	6.8	5.5	22.8		
Forced postponement of marriage or engagement	218	22.5	6.4	3.7	5.5	61.9	*	
Having children at home	219	22.4	1.8	4.6	5.5	65.8		
Necessity to postpone having children	219	32.0	16.9	8.7	5.0	37.4	**	
Conflict with partner over career decision	219	42.9	10.0	3.2	3.7	40.2		
Having dual role of wife/mother or husband/father and orthodontic resident	219	20.5	17.8	10.5	5.5	45.7		
Personal life								
Personal physical health	218	30.7	37.6	22.0	8.3	1.4	**	
Financial responsibilities	219	12.3	23.7	27.4	36.5	0.0		
Lack of home atmosphere in living quarters	218	57.3	16.5	10.6	3.7	11.9		
Professional life								
Insecurity concerning professional future	219	15.5	26.5	31.1	26.5	0.5		
Considering entering some other field of work	219	36.1	9.1	6.4	5.0	43.4		
Discrimination								
Attitude of school toward women dental students	219	58.4	12.3	5.0	4.1	20.1	**	
Discrimination because of race, class status, ethnicity, or other minority groups	219	45.2	16.9	8.7	6.8	22.4		

*P <0.05; **P <0.005.

Table V. Anxiety responses by gender and stage of progress in the program

Anxiety items	n	Distribution of replies, %				P values	
		1	2	3	4	Gender	Stage in program
To what extent are you concerned about COVID-19?	217	10.1	43.3	27.6	18.9	**	
To what extent do you believe COVID-19 will have lasting impacts on the world?	217	4.6	22.1	36.9	36.4	**	*
How likely is it that you could become infected with the novel coronavirus that causes COVID-19?	217	8.3	52.5	24.9	14.3	*	
How likely is it that someone you know could become infected with the novel coronavirus that causes COVID-19?	217	7.4	32.7	35.0	24.9	*	
How much exposure have you had to information about COVID-19?	217	1.4	17.1	49.3	32.3		
If you did become infected with the novel coronavirus that causes COVID-19, to what extent are you concerned that you will become seriously ill?	215	28.8	51.2	12.1	7.9	**	**
To what extent has the threat of COVID-19 influenced your decisions to be around people?	217	7.8	25.8	36.9	29.5	*	
To what extent has the threat of COVID-19 influenced your travel plans?	217	3.7	11.5	27.6	57.1	*	*
To what extent has the threat of COVID-19 influenced your use of safety behaviors (eg, hand sanitizer)?	217	1.8	17.5	38.7	41.9	**	

* $P < 0.05$; ** $P < 0.005$.

Table VI. Mean total stress and anxiety scores by gender and stage of progress in the program

Group	Stress total score			Anxiety total score		
	Mean	SD	P values	Mean	SD	P values
Gender						
Male	1.0	0.59	0.003	2.6	0.58	<0.001
Female	1.3	0.53		2.95	0.52	
Stage of progress in the program						
First	1.2	0.58	0.66	2.9	0.56	0.015
Middle	1.1	0.54		2.7	0.54	
Late	1.2	0.58		2.9	0.56	

SD, standard deviation.

stressed about job security and their professional futures.

Residents were least stressed about the amount of cheating in the program. Cheating has been a concern in dental schools^{27,28} as students try to distinguish themselves as top performers, especially because the national boards transitioned from numerical scores to a pass/fail system. However, cheating and competition are likely less pronounced in an orthodontic residency than dental school, as residency certificates are viewed as terminal degrees.

The remaining bottom-ranked stress-provoking factors were primarily related to the category of personal relationships. Respondents did not seem significantly stressed about relationships with members of the opposite gender, conflict with a partner over career decisions,

the attitude of the school toward women dental students, and forced postponement of marriage or engagement. This is consistent with previous dental students' and residents' studies, which indicate that personal factors are not highly stress-inducing.¹⁷ It is important to note that in most of the 5 lowest-ranked items, residents responded: not pertinent, which would also explain why these items were lowly ranked.

When comparing respondents by their stage of progress in the program, fear of being unable to catch up if behind in the workload category was significantly more stress-inducing for first-year residents than those further along in the program. This survey was disseminated between June and July when many residents initiated and concluded their formal orthodontic training. Regardless of their stage in the program, all respondents

had experience with the pandemic impacting their formal training at the time of survey administration. This included respondents who were fourth-year dental students in March 2020 and first-year orthodontic residents in July 2020. Those who were first-year residents in June 2020 may have fallen short of program expectations regarding the volume of patients seen. If program expectations were not adjusted because of the pandemic, it is logical that respondents were concerned about being able to catch up. However, when the total scores were analyzed for all stress items between stages in the program, no significant difference ($P < 0.05$) was identified.

Perhaps the most striking findings of the study are the differences between male and female respondents. When comparing genders, the total stress scores were highly significant ($P < 0.005$). Across many fields, women have been shown to lack confidence compared with their male counterparts, who are equally or less qualified.^{29,30} This gender difference seems to be rooted in deep societal gender norms³⁰ and likely preexisted among orthodontic residents before the COVID-19 pandemic. Paired with an academic and learning environment that female residents find more stressful than male residents, our observation that female respondents felt more stressed about learning clinical procedures and precision skills is understandable. Academic environments have been shown to have a profound impact on learner performance,³¹ and learning environments within dental schools are rampant with misogyny and sexism.³²⁻³⁸ Notably, female residents also relayed a greater amount of stress associated with necessary delaying of engagement, marriage, or having children.

Finally, the stress associated with discrimination was significantly higher among female respondents than males. Because of the language associated with this item, it is unclear if this is because of gender or other aspects of the respondents' identity, such as race, ethnicity, sexual orientation, religion, ability, or another minority status. Although there are more female orthodontic residents in the United States than males, most faculty in dental schools are White males.³⁹

With regard to the factors that were found to be associated with the greatest amount of anxiety, this study was conducted during the third and fourth months of the COVID-19 pandemic, at which time the prevailing belief about the severe acute respiratory syndrome coronavirus 2 virus was that it spread by respiratory droplets and it infected and caused serious illness or death primarily in adults aged >65 years or those with certain medical conditions, including obesity. Although medical conditions are unknown, it is safe to assume that most, if not all, orthodontic residents in North America are

aged <65 years. Therefore, it is logical that respondents were not highly anxious about contracting or becoming seriously ill from the virus. However, obtaining basic items for disinfection during this period, such as hand sanitizer and PPE, were challenging because of interrupted supply chains. Thus it is interesting that respondents noted this as a source of anxiety, even though they were less concerned with contracting the virus. The differences between genders and stages in the program are reflected in the total anxiety scores, which showed that females and respondents in the middle stages of their program had significantly higher anxiety levels.

Despite the survey clearly stating that the questions should be answered with respect to the COVID-19 pandemic, the authors acknowledge that this study is a snapshot in time and may not be an absolute comparison to orthodontic residents' stress and anxiety prepandemic. In addition, at the time of submission, the pandemic has been occurring for well >18 months and continues to dynamically impact societies around the world. Despite the widespread availability of COVID-19 vaccines, there are significant regional differences with regard to vaccination rate, masking, and other public health practices. Recent virus variants, including the delta and omicron, paired with lifting restrictions meant to keep the public safe, have led to additional spikes in infections and hospitalizations, causing significant stress on health systems and academic health centers in many parts of North America. Some dental programs are scaling back their clinical operations because of the high rate of infections in their communities or because of intermittent resources, including PPE. The more recent virus variants also infect younger segments of the population, including vaccinated and unvaccinated subjects. If this study were repeated in the current environment, factors that evoke the highest amount of stress and anxiety would likely evolve. Regardless, the stark differences observed in our study between male and female respondents suggest that orthodontic residency programs must evaluate and reflect on the academic environments they create for female residents. They must then work with female residents to make interventions that will allow them to feel more welcome and less marginalized. Along with establishing a more inclusive environment, such actions will inevitably improve performance. Concurrently, program directors and professional societies are encouraged to reflect on the need for workshops, storytelling, and other ways for faculty to better understand the experiences of female residents. With millennials now accounting for most orthodontic residents and the majority of faculty being from a different generational period, the expectations that female residents have of their working and

learning environment have evolved, and it is critical for programs to assure that they foster a more contemporary learning environment.

As the pandemic continues and hoping that some semblance of normalcy will return within the next year, the authors believe it would be valuable to repeat this study. As more research is conducted on factors that specifically impact orthodontic residents' stress and anxiety, and as residents become increasingly diverse across gender, race, ethnicity, religion, and other parameters, studying stress and anxiety will become increasingly important. Chronic stress from the workplace leads to burnout, impacting performance, medical errors, and productivity. Orthodontic programs should strive to create safe, welcoming, and nontoxic environments for their residents. By studying and understanding the factors that impact stress and anxiety among their residents, programs will be better positioned to provide a high-quality educational experience that effectively produces technically and emotionally competent practitioners for our communities today and tomorrow.

CONCLUSIONS

This survey-based study demonstrated that while financial responsibilities and travel plans were the most stressful and anxiety-inducing items for orthodontic residents during the early aspect of the COVID-19 pandemic, multiple items contributed to their stress and anxiety. In addition, both gender and stage of progress in a residency program impacted the level of stress and anxiety reported by respondents.

AUTHOR CREDIT STATEMENT

Edmund Khoo contributed to conceptualization, methodology, and original draft preparation; Sophia G. Saeed contributed to conceptualization, resources, manuscript review and editing; Hong-Yan Chiu contributed to data curation and formal analysis; Vicky Quach contributed to data curation and formal analysis; Malvin Janal contributed to formal analysis, manuscript review and editing, and visualization; and Kelton Stewart contributed to manuscript review and editing and supervision.

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