

# A Survey of Professional Burnout and Resilience among Orthodontists in the United States and Canada

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*2025 Research Aid Awards (RAA)*

*Dr Linnaea Emily Halpert*

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linnaea.halpert@mail.utoronto.ca  
O: 416-508-7166

# FollowUp Form

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## *Award Information*

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*In an attempt to make things a little easier for the reviewer who will read this report, please consider these two questions before this is sent for review:*

- Is this an example of your very best work, in that it provides sufficient explanation and justification, and is something otherwise worthy of publication? (We do publish the Final Report on our website, so this does need to be complete and polished.)*
- Does this Final Report provide the level of detail, etc. that you would expect, if you were the reviewer?*

### **Title of Project:\***

A Survey of Professional Burnout and Resilience among Orthodontists in the United States and Canada

### **Award Type**

Research Aid Award (RAA)

### **Period of AAOF Support**

July 1, 2025 through June 30, 2026

### **Institution**

University of Toronto

### **Names of principal advisor(s) / mentor(s), co-investigator(s) and consultant(s)**

Dr. Hashim Nainar, Dr. Natoosha Nargaski, Dr. Carolyn Dewa

### **Amount of Funding**

\$4,575.00

## Abstract

(add specific directions for each type here)

The primary objective of this research is to investigate the prevalence and severity of occupational burnout among orthodontists in the United States and Canada and to assess the relationship between burnout and resilience within this group. By examining demographic variables, the study aims to identify factors influencing burnout and resilience, ultimately informing targeted interventions to improve practitioner well-being and patient care. Understanding the factors contributing to occupational burnout and resilience among orthodontists is critical due to its potential impact on patient care, practitioner wellbeing, and the sustainability of orthodontic practices. This research aims to provide evidence-based insights to develop targeted interventions and support systems that can mitigate burnout, enhance job satisfaction, and improve overall quality of care in the field of orthodontics.

The research aims to answer the following questions:

- What are the current levels of occupational burnout among orthodontists in the United States and Canada?
- How do resilience levels impact the prevalence of burnout in this group?
- Which demographic factors influence burnout and resilience among orthodontists?

Specific Objectives:

1. Determine the prevalence and severity of current professional burnout levels of US and Canadian orthodontists using the Maslach Burnout Inventory (MBI).
2. Explore the specific dimensions of occupational burnout (Emotional exhaustion, Depersonalization, Decreased personal accomplishment) among orthodontists in the United States and Canada.
3. Assess the correlation between the prevalence of occupational burnout among the surveyed orthodontists and their demographic variables (gender, marital status, caregiving status, age, years of clinical practice, clinical practice type, patient demographics, student debt, geographic location, and work hours).
4. Examine the current levels of resilience and protective factors among orthodontists in the United States and Canada using the self-constructed Work and Well-being questionnaire (measures ability to adapt and bounce back, job content, leisure activity, vacation time, quality of sleep, physical activity, work-life balance, and engagement with nature).
5. Determine the correlation between resilience among the surveyed orthodontists and their demographic variables (gender, marital status, caregiving status, age, years of clinical practice, clinical practice type, patient demographic, student debt, geographic location, and work hours).
6. Investigate the association between occupational burnout levels and resilience scores among orthodontists in the United States and Canada.

Hypotheses:

1. U.S. and Canadian orthodontists experience increased occupational burnout compared to the general population.
2. Higher levels of resilience correlate with lower levels of occupational burnout in U.S. and Canadian orthodontists.
3. Demographic variables such as gender, marital status, caregiving status, age, years of clinical practice, type of practice, patient demographics, student debt, geographic location, and work hours influence levels of professional burnout and resilience.

## ***Respond to the following questions:***

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### **Detailed results and inferences:\***

If the work has been published, please attach a pdf of manuscript below by clicking "Upload a file".

OR

Use the text box below to describe in detail the results of your study. The intent is to share the knowledge you have generated with the AAOF and orthodontic community specifically and other who may benefit from your study. Table, Figures, Statistical Analysis, and interpretation of results should also be attached by clicking "Upload a file".

AAOF RAA Results.pdf

Results:

**Burnout Prevalence:** Of 124 MBI responses, burnout prevalence was 50% (high EE or high DP) and 29% (high EE+ high DP).

**Prevalence of Resilience:** Of 115 resilience scale responses, many respondents (59.1%) had high resilience.

**Lifestyle Factors:** Across the work-life factors assessed, the clearest predictors of burnout were leisure activity type, work-life balance, and sleep quality. The strongest predictors of resilience were social activities, nature exposure, physical activity, and adequate work-life balance.

**Correlation between Burnout and Resilience:** High resilience was linked to lower EE (29.4%,  $p=0.019$ ) and lower two-domain (EE+DP) burnout (20.6%,  $p=0.021$ ). Binary logistic regression identified leisure activity type ( $p=0.029$ ) and work-life balance ( $p=0.015$ ) as the main resilience bulwarks predictive of burnout. Those engaging in social activities had 66% lower odds of burnout, and adequate personal/family time was associated with 68% reduction in burnout risk.

**Conclusions:** Occurrence of professional burnout was notable in this exploratory sample of orthodontists.

High resilience seems to have a protective effect and was associated with reduced likelihood of professional burnout. Burnout among orthodontists is strongly linked to modifiable resilience factors such as leisure activity type, and work-life balance. Strategies such as increasing social leisure activities and work-life balance may mitigate burnout and enhance professional wellbeing among orthodontists.

**Significance:** Despite occupational stressors, little research has explored professional burnout and resilience among orthodontists. These exploratory findings support further investigations into resilience bulwarks and workplace-based strategies for addressing burnout among orthodontists.

### **Were the original, specific aims of the proposal realized?\***

The original specific aims were largely realized, although some were refined during the study to better match the exploratory design, sample size, and statistical limitations.

The first two aims were achieved: the study measured the prevalence and severity of burnout among US and Canadian orthodontists using the MBI, and it described the three burnout dimensions of emotional exhaustion, depersonalization, and personal accomplishment. The study found notable burnout, particularly using the one-dimensional and two-dimensional definitions.

The resilience aim was also achieved. Resilience was measured using the two-item resilience scale as part of the Work and Well-being questionnaire, and the study examined its relationship with burnout. Higher resilience was associated with lower emotional exhaustion and lower two-dimensional burnout.

The aim related to demographic variables was partially realized. The original proposal listed many demographic variables, including gender, marital status, age, years in practice, patient demographic, geographic location, caregiving, practice type, student debt, and work hours. In the final analysis, inferential testing focused on the demographic variables most directly tied to the conceptual framework: caregiving

status, career/practice status, student loan debt amount and burden, and hours worked per week. The remaining demographic variables were used mainly to describe the sample and assess generalizability. This refinement was appropriate because the modest sample size made testing every demographic variable more vulnerable to sparse cells, unstable estimates, and multiple-comparison error.

The protective-factor aim was achieved. The study assessed job content, leisure activity, vacation duration, sleep quality, physical activity, work-life balance, and nature exposure. The clearest modifiable factors associated with burnout and/or resilience were social leisure activity, work-life balance, sleep quality, nature exposure, and physical activity, with logistic regression identifying social leisure activity and work-life balance as the main resilience-related factors associated with lower odds of burnout.

Overall, the original aims were realized in an exploratory manner. The study successfully characterized burnout and resilience among orthodontists, examined their association, and identified potentially modifiable resilience bulwarks. However, because of the cross-sectional design, low response rate, and modest sample size, the findings should be interpreted as hypothesis-generating rather than definitive or causal.

### Were the results published?\*

No

### Have the results of this proposal been presented?\*

Yes

### To what extent have you used, or how do you intend to use, AAOF funding to further your career?\*

The AAOF funding has been instrumental in advancing both my current research and broader academic goals. It enabled critical components of my study, most notably the purchase of the Maslach Burnout Inventory license, professional statistical consultation, and survey distribution via the AAO Partners in Research program. These resources have ensured methodological rigour and broad reach for my investigation into burnout and resilience among orthodontists.

Beyond this specific project, the award has opened opportunities to engage with the research community through presentations at the AAO, helping me develop as an academic. It has also strengthened my CV, which will support future applications for faculty positions or competitive post-residency fellowships.

Most importantly, the project aligns with my long-term career objective of contributing meaningfully to orthodontic education and wellness advocacy. The AAOF's support has been pivotal in launching this line of inquiry and in shaping me into a future leader in academic orthodontics.

### Accounting: Were there any leftover funds?\*

If "yes", enter your best estimate and work with your grants manager to finalize financial reports and send refund payable to: AAOF

Attn: George  
401 N. Lindbergh Blvd.

St. Louis, MO. 63141-7839

If "no", enter zero.

\$0.00

## *Not Published*

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### **Are there plans to publish? If not, why not?\***

Yes, there are plans to publish within the next year.

## *Presented*

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### **Please list titles, author or co-authors of these presentation/s, year and locations:\***

University of Toronto Research Day: (Third place winner)

- Title: An exploratory survey of Professional Burnout and Resilience among Orthodontists in the United States and Canada

- Authors: Linnaea Halpert\*, Carolyn Dewa\*\*, Natoosha Nargaski\*, Hashim Nainar\* (\*University of Toronto, Toronto, ON, Canada. \*\*UC Davis Health, Sacramento, CA, United States)

- Presentation location: Toronto, 2026

E-poster:

- Title: An exploratory survey of Professional Burnout and Resilience among Orthodontists in the United States and Canada

- Authors: Linnaea Halpert\*, Carolyn Dewa\*\*, Natoosha Nargaski\*, Hashim Nainar\* (\*University of Toronto, Toronto, ON, Canada. \*\*UC Davis Health, Sacramento, CA, United States)

- Presentation location: AAO Orlando, 2026

### **Was AAOF support acknowledged?**

If so, please describe:

Yes, the support of the AAOF was acknowledged on the poster and in all presentations given. The following statement was written: "This research was funded by the American Association of Orthodontists Foundation (AAOF) Research Aid Award."

## *Internal Review*

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### **Reviewer comments**

Four of the original planned aims were achieved. One aim was partially achieved. The research aid award resulted in two presentations. There are plans to submit the study findings (manuscript) to a peer reviewed journal.

### **Reviewer Status\***

Approved

## File Attachment Summary

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### *Applicant File Uploads*

- AAOF RAA Results.pdf

## **Results**

### *Prevalence of Burnout*

In the literature, burnout has been defined in multiple ways including based on one dimension (Shanafelt et al., 2012), two dimensions (EE and DP versus DP and PA) (Denton et al., 2008; Klimo et al., 2013), or all three dimensions (EE, DP, and PA) (Gorter et al., 2000). In the present study sample (n=124), the prevalence of burnout based on one dimension of either high EE or high DP was 50% (Table 1). The prevalence of professional burnout based on two dimensions was either 29% (high EE and high DP; Table 2) or 10.5% (high DP and low PA; Table 3). The prevalence of burnout based on all three dimensions (high EE, high DP, and low PA) was 5.6% (Table 4).

**Table 1.** Prevalence of Professional Burnout based on 1 MBI Dimension (High EE or High DP)

	Frequency (n)	Percentage (%)
Respondents without burnout	62	50.0
Respondents with burnout	62	50.0
Total	124	100.0

**Table 2.** Prevalence of Professional Burnout based on 2 MBI Dimensions (High EE and High DP)

	Frequency (n)	Percentage (%)
Respondents without burnout	88	71.0
Respondents with burnout	36	29.0
Total	124	100.0

**Table 3.** Prevalence of Professional Burnout based on 2 MBI Dimensions (High DP and Low PA)

	Frequency (n)	Percentage (%)
Respondents without burnout	111	89.5
Respondents with burnout	13	10.5
Total	124	100.0

**Table 4.** Prevalence of Professional Burnout based on all 3 MBI Dimensions (High EE, High DP and Low PA)

	Frequency (n)	Percentage (%)
Respondents without burnout	117	94.4
Respondents with burnout	7	5.6

### *Burnout (High EE and High DP) versus Resilience*

When comparing high EE to resilience, it was found that there was significantly lower proportion of respondents with high emotional exhaustion among those with high resilience (29.4%) compared to those with low resilience (51.1%),  $p = 0.019$  (Table 5, figure 1a). High depersonalization rate was also lower for respondents with high resilience (33.8%) compared to those with low resilience (48.9%), but the difference was not statistically significant ( $p = 0.104$ ) (Table 6, figure 1b). High resilience was also associated with significantly lower prevalence of professional burnout based on 2 MBI dimensions [high EE and high DP] (20.6%) compared to respondents with low resilience (40.4%),  $p = 0.021$  (Table 7, figure 1c).

**Table 5.** Comparison of Resilience Level Versus Emotional Exhaustion Category (n=115)

	Low Resilience (0-6)	High Resilience (7-8)	Total
Not High EE (<27)	23 (48.9%)	48 (70.6%)	71
High EE (≥27)	24 (51.1%)	20 (29.4%)	44
Total	47	68	115

$\chi^2 (1) = 5.52, p = 0.019$

**Table 6.** Comparison of Resilience Level Versus Depersonalization Category (n=115)

	Low Resilience (0-6)	High Resilience (7-8)	Total
Not High Dp (<10)	24 (51.1%)	45 (66.2%)	69
High Dp (≥10)	23 (48.9%)	23 (33.8%)	46
Total	47	68	115

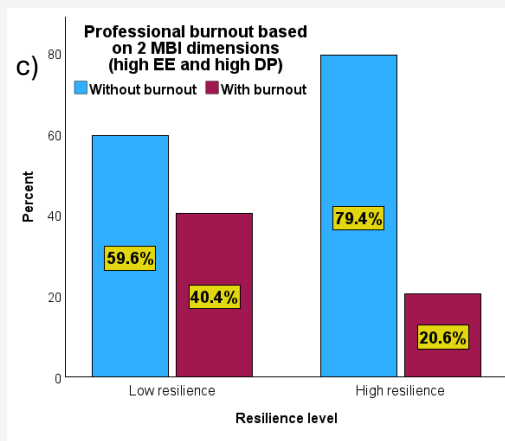
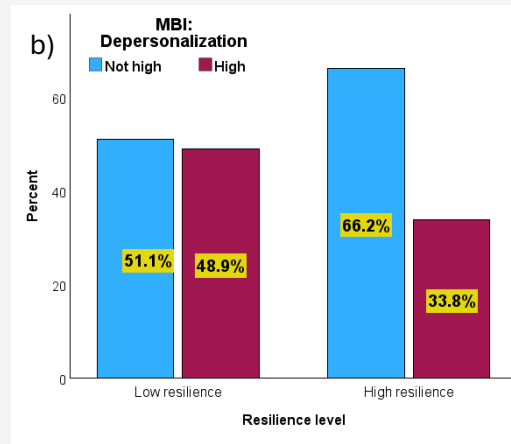
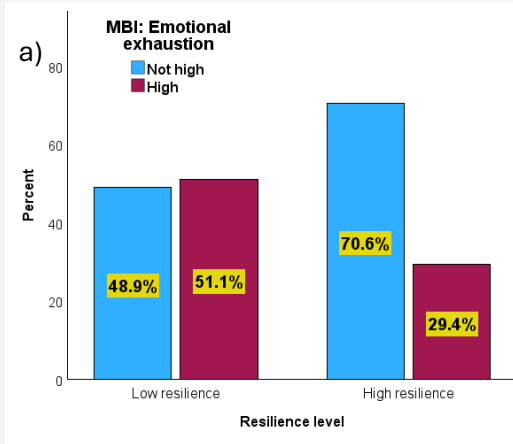
$\chi^2 (1) = 2.65, p = 0.104$

**Table 7.** Relationship of Resilience to Professional Burnout based on 2 Dimensions (High EE and High Dp) (n=115)

	Low Resilience (0-6)	High Resilience (7-8)	Total
No Burnout	28 (59.6%)	54 (79.4%)	82
Burnout (2 dimensions)	19 (40.4%)	14 (20.6%)	33
Total	47	68	115

$\chi^2 (1) = 5.53, p = 0.021$

Note: percentages are within each resilience level



**Figure 1.** Bar graphs representing the relationship between resilience (low = 0-6; high = 7-8) and burnout based on a) Emotional exhaustion (High  $\geq 27$ ; Not high  $< 27$ ), b) Depersonalization (High  $\geq 10$ ; Not high  $< 10$ ), and c) Two-dimensional burnout (High EE and High DP)

## Lifestyle Factors

Across the work-life factors assessed, the clearest predictors of burnout were leisure activity type, work-life balance, and sleep quality (Table 8). The strongest predictors of resilience were social activities, nature exposure, physical activity, and adequate work-life balance (Table 8). However, the predictors of resilience did not remain after Bonferroni correction.

**Table 8.** Association between Self-constructed Items and Burnout/Resilience

Self-constructed item	Comparison	EE	DP	PA	High EE + High DP	Resilience	Bonferroni Correction
Leisure activity	Social vs. solitary (active + passive)	Sig: Social → ↓ EE vs. solitary → ↑ EE	Sig: Social → ↓ DP vs. solitary → ↑ DP)	Sig: Social → ↓ PA = worse burnout	Sig: Social → ↓ combined burnout	Sig: Social → ↑ resilience	Sig: EE, PA, EE+DP; NS: DP, resilience
Nature exposure	High > 3 hrs/week vs. low ≤ 3 hrs	NS (trend: high nature → ↓ EE)	NS	NS	NS	Sig: High nature → ↑ resilience	NS
Vacation duration	Long ≥ 11 days vs. short ≤ 10 days	NS (trend: long → ↓ EE)	NS (trend: long → ↓ DP)	NS	NS (trend: long → ↓ combined burnout)	NS (trend: long → ↑ resilience)	NS
Physical activity frequency	High ≥ 4 events/week vs. ≤ 3	NS (trend: high activity → ↓ EE)	NS	NS	NS (trend: high activity → ↓ combined burnout)	Sig: High activity → ↑ resilience	NS
Work-life balance	Enough vs. not enough	Sig: Enough time → ↓ EE	NS (mild inverse trend)	NS	Sig: Enough time → ↓ combined burnout	Sig: Enough time → ↑ resilience	Sig: EE, EE+DP; NS: resilience
Sleep quality (SQS)	High (9–10) vs. low (0–8)	Sig: high sleep → ↓ EE	Sig: high sleep → ↓ DP	Sig: high sleep → low PA	Sig: high sleep → ↓ combined burnout	NS	Sig: EE ; NS: DP, PA, EE+DP

Note: Sig= Bonferroni-adjusted significance threshold  $p < 0.0125$  (0.05/4), NS = not significant, ↑ = increased score/association, ↓ = decreased score/association, — = no significant association

## Binary Logistic Regression: Professional Burnout versus Resilience Factors

A binary logistic regression model was conducted to identify resilience items [bulwarks] associated with lower probability of professional burnout. The model was set with dependent variable (outcome) being a dichotomous indicator of professional burnout based on 2 MBI dimensions (high EE and high DP) coded as 0 = Without burnout, 1 = With burnout. The independent variables included predominant leisure activity, nature exposure, physical activity level, time for personal life, and quality of sleep. Model results are presented in Table 9. The multivariable logistic regression model showed that only two predictors were statistically significant. These included predominant leisure activity ( $p = 0.029$ ) and time for personal/family life ( $p = 0.015$ ) (Table 9). Those engaging in social activities had 66% lower odds of 2-dimensional burnout (OR = 0.34, 95% CI: 0.13–0.90) (Table 9). As well, those who had enough time for personal/family time were 68% less likely to experience 2-dimensional burnout (OR = 0.32, 95%

CI: 0.13–0.80) (Table 9). Therefore, engaging in social activities and having enough time for personal life were the most influential resilience factors for burnout.

**Table 9.** Logistic regression analysis for resilience factors for burnout

Model predictors	P-value	Odds Ratio	95% Confidence Interval
Predominant leisure activity Solitary activity (active + passive) Social activities	0.029*	0.34	0.13 – 0.90
Nature exposure (Time spent looking at nature) Low exposure (up to 3 hours) High exposure (greater than 3 hours)	0.445	1.46	0.55 – 3.85
Physical activity level Low (3 events or less) High (4 events and more)	0.971	0.98	0.37 – 2.60
Time for personal/family life Not enough Enough (Strongly agree + Agree)	0.015*	0.32	0.13 – 0.80
Quality of sleep Low High	0.186	0.51	0.19 – 1.38

\*p<0.05

## **Conclusions**

Occurrence of professional burnout was notable in this exploratory sample of orthodontists. High resilience seems to have a protective effect and was associated with reduced likelihood of professional burnout. Burnout among orthodontists is strongly linked to modifiable resilience factors such as leisure activity type, and work-life balance. Strategies such as increasing social leisure activities and work-life balance may mitigate burnout and enhance professional wellbeing among orthodontists.

## **Significance**

Despite occupational stressors, little research has explored professional burnout and resilience among orthodontists. These exploratory findings support further investigations into resilience bulwarks and workplace-based strategies for addressing burnout among orthodontists.

## References

- Denton, D. A., Newton, J. T., & Bower, E. J. (2008). Occupational burnout and work engagement: a national survey of dentists in the United Kingdom. *British Dental Journal*, *205*(7), E13–E13. <https://doi.org/10.1038/sj.bdj.2008.654>
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- Klimo, P., DeCuyper, M., Ragel, B. T., McCartney, S., Couldwell, W. T., & Boop, F. A. (2013). Career Satisfaction and Burnout Among U.S. Neurosurgeons: A Feasibility and Pilot Study. *World Neurosurgery*, *80*(5), e59–e68. <https://doi.org/10.1016/j.wneu.2012.09.009>
- Shanafelt, T. D., Oreskovich, M. R., Dyrbye, L. N., Satele, D. V., Hanks, J. B., Sloan, J. A., & Balch, C. M. (2012). Avoiding Burnout. *Annals of Surgery*, *255*(4), 625–633. <https://doi.org/10.1097/SLA.0b013e31824b2fa0>