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Burnout syndrome in a single cohort of chiropractic students: A longitudinal study

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ABSTRACT

Objective: Physician well-being impacts all areas of health care. There is, however, a paucity of evidence regarding burnout among chiropractic students. The purpose of this project is to evaluate burnout among a single cohort of chiropractic students as they progress through their clinical rotation.

Methods: The Professional Fulfillment Index (PFI) was administered to chiropractic students (n = 108) at the start of their internship in January of 2021. The PFI was also distributed to students at the end of each of their 3 internship terms. The Maslach Burnout Inventory–Human Services Survey (MBI-HSS) was administered at the end of interns' eighth term of study to assess validity with the PFI. The MBI and PFI were analyzed via pairwise correlation. Demographic and relevant term questions were asked at baseline and respective terms and analyzed with descriptive statistics.

Results: Of the study's 78 respondents (72.2% response rate), 55.8% were male with an average age of 28.6 years. Pairwise comparisons revealed statistically significant burnout differences between the baseline timepoint and the end of the eighth term, and between the baseline and the end of the ninth term. PFI burnout was correlated to emotional exhaustion in the MBI.

Conclusion: Our study found that approximately half of the participating chiropractic students suffered from burnout. This percentage is similar to burnout rates seen in other health care providers. Moreover, there is no widely accepted burnout threshold used in the literature. As such, studies examining standardization of burnout calculations may be warranted.

Key Indexing Terms: Burnout; Psychological; Chiropractic; Students; Education; Internship

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INTRODUCTION

Staff burnout has been described as a syndrome characterized by physical and behavioral indicators.[1] Researchers consider burnout to be a prolonged response to chronic emotional and interpersonal stressors in the work environment that is typified by 3 dimensions.[2] These dimensions are emotional exhaustion (EE), depersonalization (DP), and low personal accomplishment (PA). The concept of burnout, and how it affects physicians across multiple medical specialties, has been a topic of interest for several decades.[1,3] Following the COVID-19 pandemic, burnout among medical providers became a significant concern.[4] While burnout affects all aspects of society, health care providers report burnout symptoms at twice the rate of the general population.[5,6] Moreover, burnout is highest in young health care providers' during their first 10 years of practice.[3]

High health care provider burnout rates are noteworthy because they have been linked to higher costs and diminished patient care.[6–8] A 2019 study reported that physician burnout is associated with poorer quality care, decreased practice guideline adherence, less communication, medical errors, diminished safety metrics, and poorer patient outcomes.[8] High burnout levels have also been linked to reduced patient load, reduced clinical schedules, providers leaving a practice, and retirement.[3] A 2018 article noted that replacing a physician is expensive and may cost 2–3 times the physician's annual salary.[9] These data

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were further quantified in 2019 when a study found the direct costs of American physician burnout to be $4.6 billion annually or approximately $7600 per physician.[6] Moreover, the study noted that the addition of indirect burnout costs would result in higher actual costs.[6]

The MBI-HSS is a validated instrument traditionally used to calculate burnout.[10] The questionnaire consists of 22 questions graded on a 7-point rating scale (0-Never; 6-Daily). The questions cover three dimensions of burnout: emotional exhaustion (EE), depersonalization (DP), and personal accomplishment (PA). The MBI-HSS is commonly calculated by totaling the EE, DP, and PA scores, but many different burnout thresholds are utilized in the literature. In 2016, it was reported that Maslach's burnout definition risks "underestimating the burnout rate of individuals who score either high EE or high DP scores".[11] This has led some researchers to employ variations of the Maslach burnout guidelines.

The Professional Fulfillment Index (PFI) is a validated tool that can be used to calculate burnout.[12] It can also be used to measure pre- and post-intervention scores, and physician well-being.[12] The index consists of 16 questions rated on a 5-point rating scale (0-Not at all true; 4-Completely true) with 3 subscales: professional fulfillment (PF), work exhaustion (WE), and interpersonal disengagement (ID). The PFI burnout score is calculated by averaging the individual item scores within the WE and ID subscales. The PFI burnout cutoff level, which was validated by a study in 2018, is 1.33.[12] As such, PFI burnout scores of 1.33 or above are indicative of burnout.

Current health care trends indicate that health care students and residents demonstrate moderate to high burnout levels.[9,13] Studies report that medical students experience burnout at a rate of at least 50%.[14] In a 2018 systematic review, the authors noted that approximately half of medical residents suffer from burnout.[9] This is similar to rates seen among practicing physicians.[9] The authors also reported that resident burnout varies by medical specialty and is highest toward the end of or shortly after the conclusion of clinical training.[9,15] The highest burnout rates were found among surgical residents with specialties in general surgery, anesthesiology, orthopedics, and obstetrics/gynecology.[9] The study's lowest burnout rates were reported in the otolaryngology and neurology residents.[9] Similarly, another study reported that the burnout rate among Canadian emergency medical residents was approximately 62% while burnout rates in American emergency medical residents has been found to approach 76%.[15]

There is a paucity of evidence regarding burnout within the chiropractic profession. Additionally, there are only 2 studies that directly address this topic in chiropractic students.[13,16] Neither of these studies are longitudinal nor focus on clinical chiropractic students. The studies do not report burnout rates, so the prevalence of chiropractic student burnout is unknown. Since burnout is highest in young health care providers, and because it has not been examined in clinical chiropractic students, we sought to identify burnout in chiropractic students prior to entering clinical practice.[3] Chiropractic education varies by program length and term type. Typically, after completion of academic courses, chiropractic trainees participate in approximately one year of clinical training. The primary focus of this study is to explore burnout among chiropractic students during their clinical training using the PFI. We also compared the PFI burnout results to the more commonly used MBI-HSS to assess validity.

METHODS

This longitudinal survey investigation was approved by the institutional review board of Parker University (study number is A-00199).

Participants

The longitudinal survey was administered in January of 2021 to a convenience sample of chiropractic students (n = 108) entering their final year of training. The final year of this sample's chiropractic training represents a full year of clinical experience that is setup as 3 terms. Each term of study is 15 weeks long. At the start of their clinical experience, all students are expected to attend a student clinic orientation. During the January 2021 clinic orientation event, time was set aside to inform students about this study and its voluntary nature. If a student was interested in the study, the student scanned a quick response (QR) code. The QR code linked to a consent form that was followed by the study's initial survey. Investigators were accessible to address any questions or concerns expressed by the target population.

This study's chiropractic training program is 10 terms. The first 7 terms are comprised of preclinical study. The final 3 terms are spent in the clinical setting. During this clinical experience, students receive hands-on, practical training under the supervision of a licensed, attending Doctor of Chiropractic. Student clinicians treat various musculoskeletal conditions among varying population groups. Clinical trainees allot 40–50 hours a week to clinical education. Additionally, students are expected to demonstrate meta-competency mastery during objective structured clinical examinations (OSCE) and patient encounters. Upon meeting clinical requirements, student clinicians have the opportunity to complete their clinical training in various health care settings including private practices, interdisciplinary practices, and hospitals.

Measurement Tools

The primary outcome measure in this study is the Professional Fulfillment Index (PFI), which is a validated tool that specifies interpersonal disengagement as it pertains to patient care.[12] It is a suitable assessment tool to measure pre- and post-intervention physician well-being.[12] The index consists of 16 questions rated on a 5-point rating scale (0-Not at all true; 4-Completely true) with 3 subscales. These subscales are professional fulfillment (PF), work exhaustion (WE), and interpersonal disengagement (ID). The PFI can be completed in less than 3 minutes.[12] The PFI burnout score is calculated by averaging the individual item scores within the WE and ID sub-scales. PFI burnout was calculated by adding the sum of the 4 work exhaustion (WE) items with the sum of the 6 interpersonal disengagement (ID) items and dividing the result by 10. As such, PFI burnout = [(WE + ID)/10]. A cutoff level of 1.33 was used to establish PFI burnout. PFI burnout scores of 1.33 or above, therefore, indicated burnout. This is the calculation method validated in the literature.[12] The PFI was administered to clinical chiropractic students via email as a baseline in January 2021 (Baseline) and at the end of their 3 clinical terms in April 2021

Table 1 - Addendum Questions

T1: I feel that preparing for the clinical Capstone examination puts a lot of stress on me.				
Not at all	**Very little**	**Moderately**	**A lot**	**Extremely**
Score = 0	Score = 1	Score = 2	Score = 3	Score = 4
[]	[]	[]	[]	[]
T2: I feel it is important to get the community-based internship position of my choice.				
Not at all	**Very little**	**Moderately**	**A lot**	**Extremely**
Score = 0	Score = 1	Score = 2	Score = 3	Score = 4
[]	[]	[]	[]	[]
T3. I worry about meeting my graduation requirements on time.				
Not at all	**Very little**	**Moderately**	**A lot**	**Extremely**
Score = 0	Score = 1	Score = 2	Score = 3	Score = 4
[]	[]	[]	[]	[]

(Term 1 [T1]), August 2021 (Term 2 [T2]), and finally in December of 2021 (Term 3 [T3]).

To assess validity of the PFI burnout scores, the MBI-HSS, a more commonly used burnout questionnaire, was administered to study participants at the end of their first clinical term (T1). This survey is comprised of 22 items pertaining to 3 dimensions of burnout. These dimensions are emotional exhaustion (EE), depersonalization (DP), and personal accomplishment (PA). MBI-HSS responses are based on a 7-point rating scale (0-Never; 6-Daily). The survey is considered an adequate tool to assess burnout and has demonstrated both reliability and validity.[10] The MBI-HSS is traditionally calculated by totaling scores in each of the 3 dimensions, thereby allowing for the adoption of the following cutoff points: low EE $\leq$ 18, average EE = 19–26, high EE $\geq$ 27; low DP $\leq$ 5, average DP = 6–9, high DP $\geq$ 10; and low PA $\geq$ 40, average PA = 39–34, high PA $\leq$ 33.[17] Many researchers have calculated MBI-HSS burnout by totaling scores in the EE and DP dimensions, thereby allowing for the adoption of the following cutoff points: EE $\geq$ 27 and/or DP $\geq$ 10. Additionally, the literature demonstrates that MBI-HSS burnout is often calculated as EE $\geq$ 27.[11]

Demographic and relevant term questions were also collected at baseline and respective terms. Students were asked to identify their age, gender, and answer relevant end-of-term questions created by the investigative team. The end-of-term questions addressed stress associated with preparation for an OSCE, the matching process for clinical rotations, and the fulfillment of graduation requirements. The addendum questions were formatted similarly to PFI questions with each question answered on a 5-point rating scale (0-not at all; 4-extremely). Each relevant term question's raw scores were averaged and the 3 averages were compared. The rationale behind calculating relevant question average scores was that a higher average score may indicate a greater contribution to burnout. The 3 addendum questions are shown in Table 1.

Data Analysis

Descriptive statistics were used to evaluate all outcome measures and demographic information. Respondents who had any incomplete data points were assumed to have no burnout. Pairwise t-test was used to evaluate change in PFI throughout the students' clinical experience. To evaluate the impact of gender and age on PFI, a 2-sample *t* test and an ANOVA were conducted, respectively. Pairwise correlation was used to compare PFI and MBI-HSS burnout scales. Analysis was conducted in Excel and STATA (StataCorp 14.2).

RESULTS

The baseline survey was completed by 78 students (72.2%), 55.8% of whom were male, and the average respondent's age was 28.6 years (range: 22–58). Reasons for non-participation were not collected. Response rates for each time point were: T1–46/108 (42.6%); T2–38/108 (35.2%); and T3–41/108 (38.0%).

Study response rates and burnout rates can be found in Table 2. Baseline PFI surveys had the highest response rates and the lowest burnout rates. T2 had the lowest response rates but the highest burnout rates. The difference between Baseline-T1 and Baseline-T2 burnout rates represented statistically significant changes ($p < .05$). No statistically significant differences in burnout by age or gender were identified. While the percentage of students with burnout increased during the statistically significant timepoints, the absolute number of students with burnout decreased.

Study correlations can be found in Table 3. Pairwise analysis found that PFI and the MBI's EE subscale were strongly correlated at .7682 ($p = .000$). R^2 (0.7682^2) equaled 59%. Pairwise analysis also found that PFI was not correlated to traditional Maslach burnout classification guidelines. The traditional Maslach burnout classification guidelines included EE $\geq$ 27 with DP $\geq$ 13 and PA $\leq$ 33, EE = 19–26 with DP = 6–9 and PA = 39–34, and EE $\leq$ 18 with DP $\leq$ 5 and PA $\geq$ 40. Additionally, PFI was not correlated to EE $\geq$ 27 and/or DP $\geq$ 10. Finally, PFI was not found to be correlated with DP.

Table 2 - Frequency of Respondents With Burnout[a] Based on Data Collection Time Points. Data shown as *n* (%)

	Baseline	Term 1	Term 2	Term 3
Responses	78 (72.2%)	46 (42.6%)	38 (35.2%)	41 (38.0%)
PFI Burnout	31 (39.7%)	22 (47.8%)	25 (65.8%)	20 (48.8%)
p-value (baseline to respective term)		$p = .0112$	$p = .0066$	$p = .0612$

[a] PFI Burnout = $\frac{(\text{Work Exhaustion} \pm \text{Interpersonal Disengagement})}{10} \geq 1.33$.

Table 3 - Results of All Potential MBI-HSS Analysis at Term 1 (Response Rate 43 (39.8%)) and Correlation With PFI Scores at Term 1 (22 (47.8%))

	Frequency *n* (%)	Correlation score
EE ≥ 27 and/or DP ≥ 10	23 (53.5%)	.1657
EE ≥ 27 with DP ≥ 13 and PA ≤ 33	2 (4.65%)	.2051
EE = 19–26 with DP = 6–9 and PA = 39–34	0	NA
EE ≤ 18 with DP ≤ 5 and PA ≥ 40	7 (16.3%)	−.1885
EE	43 (100%)	.7682
DP	43 (100%)	.0013

DISCUSSION

The results of this yearlong longitudinal study found participating chiropractic students to have burnout at different frequencies throughout their clinical experience (39.7%–65.8%) with approximately half experiencing burnout at some point throughout the clinical experience. This percentage is similar to burnout rates that have been found in medical students, residents, and practicing providers. Current literature indicates approximately half of all medical students suffer from burnout.[14] Additionally, about half of medical residents suffer from burnout.[9] Other investigators noted that health care professional burnout rates range from 25% to 75%.[11] In 2017, physician burnout was found to be about 41%, while another study in 2019 noted that 54% of physicians reported at least one burnout symptom.[5,6] Recent studies reported that half of all health care providers suffer from burnout symptoms.[3,8]

Stress has been linked to burnout among chiropractic students and it has been found to be similar to stress levels in medical students.[13] Research findings of moderate to high perceived stress and fatigue levels among chiropractic students is, therefore, not unexpected.[18] Interestingly, the same investigators did not find that chiropractic students' stress and fatigue levels varied by term.[18] It should be noted that these researchers did not study stress and fatigue solely during students' clinical experience; however, another chiropractic study found chiropractic students' stress to be highest in the last year of study, coinciding with their clinical experience timeframe.[19] Further chiropractic research noted that student stress is highest during OSCE.[20] Of the addendum questions asked in this study, the T1 question had the highest average score. The T1 question stated "I feel that preparing for the clinical Capstone examination puts a lot of stress on me." This finding is plausible based on previously noted work.[20] Additional research regarding the association between burnout and OSCE may be warranted.

While burnout has also been found to be highest among young physicians, it is least common in physicians with more than 30 years of practice.[3] As such, it seems that efforts should be made to reduce burnout levels among clinical chiropractic students and those entering professional practice. Since burnout was present in this study's cohort of chiropractic students, studies regarding burnout mitigation in this population are needed. The authors of this paper identified no consensus studies regarding burnout mitigation methods among chiropractic students. A single paper that examined stress mitigation methods in chiropractic students was identified.[18] This is significant as stress has been correlated to 2 burnout domains, emotional exhaustion and depersonalization. This same paper reported that stress mitigation methods among chiropractic students commonly include chiropractic care (50.0%), music listening (50.7%), conversation with friends (52.1%), sleeping (62.9%) and exercising (67.1%).[18] This suggests that mitigators of chiropractic stress are individual-level initiatives.[21] The literature, however, suggests that burnout should be addressed via both individual- and organizational-level initiatives.[21] In fact, it has been reported that the greatest influences on burnout are the organizational-level influences of high work demand and insufficient work resources.[21] Additional research argues that burnout must be addressed through a combination of individual and organizational-level initiatives, because individual-level initiatives alone are insufficient to overcome high work demand and insufficient work resources.[3,21]

Evidence-based individual-level interventions include group mindfulness meditation and cognitive-behavioral training.[21] Evidence-based organizational-level intervention categories include work autonomy, social support, employee decision-making, and performance management.[21] A comprehensive list of evidence-based organizational-level mitigation actions are found in Table 4.

Table 4 - Evidence-Based Organizational-Level Mitigation Recommendations

Categories	Specific Mitigation Actions
Work Autonomy	Allow for autonomy in job selection. Allow for job content flexibility. Provide job variety. Provide professional development opportunities.
Social Support	Foster employee relationships built on trust. Allow for group collaboration. Limit unnecessary social interaction. Encourage work/life balance.
Shared Governance	Provide employees with necessary resources. Provide clear and transparent communication. Encourage employee-inclusive strategic decision making. Seek employee feedback on decisions.
Performance Management	Provide regular job feedback. Include employees in goal setting. Offer financial and non-financial job rewards. Ensure a fair performance management process.

Investigators have noted that burnout mitigation must shift focus from the individual to organizational conditions.[11] Furthermore, other researchers have listed organizational areas that must be addressed to reduce burnout.[22] Per the literature, it is apparent that chiropractic student burnout cannot be mitigated via individual strategies alone. In addition to individual strategies, such as mindfulness meditation and cognitive-behavioral therapy, organizational mitigation strategies are necessary to combat chiropractic student burnout. As such, the authors suggest that studies regarding organizational-level

interventions within chiropractic teaching institutions are warranted. This study also suggests that EE and PFI are strongly correlated. Students may, therefore, benefit from organizational-level burnout mitigation initiatives that focus on actions that reduce students' emotional exhaustion. Since high work demand and insufficient work resources have the greatest influence on burnout, this paper's authors suggest that organizations should begin mitigation efforts by decreasing extraneous student work load and increasing student work resources.[21]

As previously noted, there is no consensus threshold for burnout, and many different methods are used in the literature.[15] A 2016 paper demonstrated that a lack of calculation standardization plagues burnout studies.[11] Additionally, concern that the Maslach guidelines underestimate burnout has been expressed in the literature.[11] In fact, when the Maslach guidelines were used in a 2009 study, 68% of the study's participants could not be categorized into high, average, or low burnout per MBI-HSS standards.[17] Many researchers have thus employed variations of the Maslach burnout guidelines. This study's findings seem to support this concept. When MBI burnout was calculated using the Maslach guidelines, approximately 79% of this study's participants could not be classified into high, average, or low burnout.[11] Studies examining standardization of burnout calculations are warranted.

Finally, in 2018, authors noted that the PFI dimensions of burnout correlated highly with similar MBI dimensions.[12] For instance, the researchers found that WE was correlated to EE, and ID was correlated to DP.[12] This investigation also found PFI to correlate with EE. While this study did not find a correlation between ID and DP, the correlation between PFI and EE was strong. This study, therefore, suggests that exhaustion is strongly correlated to burnout regardless of the employed measurement scale.

Limitations

A number of study limitations are noted. Firstly, the study was a longitudinal study of a single cohort at a single university. The findings should be interpreted cautiously and not be generalized. Future studies might include multiple cohorts at multiple sites. The MBI-HSS was only used during one of the survey periods. Response rates were low for all timepoints except baseline. The COVID-19 pandemic occurred during this study, which may have impacted the response rate and served as an additional source of burnout.

CONCLUSION

The use of the Professional Fulfillment Index (PFI) in this study suggested that approximately half of the participating chiropractic students suffered from burnout. This percentage is similar to burnout rates that have been found in medical students, medical residents, and practicing health care providers.[3,8,9,14,23] This is noteworthy because high health care provider burnout rates have been linked to diminished patient care and higher health care costs.[6,8] In 2019, researchers reported that burnout led to poorer quality care, poorer practice guideline adherence, poorer communication, medical errors, poorer safety metrics, and poorer patient outcomes.[8] The results of this study suggest burnout may negatively impact students' educational experience. Chiropractic institutions should identify and respond to students' needs in order to reduce burnout and improve patient care. Burnout mitigation efforts may be most effective if they focus on reducing organizational characteristics that contribute to emotional exhaustion. Finally, there is no set standard for burnout and many different methods are used in the literature.[15] Further research is needed examining a standardized approach to better measure burnout across disciplines.

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