

Efficacy of Retreats on Resident Physician Well-being as Measured by Maslach Burnout Index Analysis: a Cross-sectional Study

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Abstract

Background: Awareness of burnout has led residency programs to seek interventions to promote well-being, resiliency, camaraderie and social network development. Limited evidence exists on the efficacy of specific interventions. This study evaluated the efficacy of an emergency medicine residency program's semi-annual retreat using serial administration of the Maslach burnout index and resident well-being survey.

Methods: Surveys were administered to all emergency medicine residents (n=25) in July 2018 and before and after fall 2018 and winter 2019 retreats. Retreats included a meal, team building, and social networking opportunities (bowling, softball, snow tubing, and sledding). Comparisons of responses between baseline, pre-retreat, and post-retreat were evaluated using two-sample t, Wilcoxon rank sum, and Fisher exact tests.

Results: Sixteen emergency medicine residents (64%) responded at baseline. Response rates on subsequent surveys ranged from 14 (56%) to 21 (84%). Nineteen percent of residents exhibited burnout at baseline. This peaked at 36% pre-winter retreat. Burnout decreased after each retreat (fall: 29% to 6%, winter: 36% to 13%). Mean Maslach burnout index subscores for emotional exhaustion (13 to 9) and depersonalization (7 to 5) decreased from baseline to post-fall retreat, but neither changed significantly over the entire study period (emotional exhaustion: 13 to 12, depersonalization: 7 to 6). Resident well-being survey pre- and post-retreat responses were similar on all items.

Conclusion: Meaningful, but not statistically significant differences were detected on the Maslach burnout index and resident well-being survey in association with a retreat. Mean emotional exhaustion, depersonalization and burnout decreased after retreats. Larger studies would provide further insight into the significance of these trends.

Introduction

Burnout, a term encompassing feelings of emotional exhaustion, depersonalization, and reduced sense of personal accomplishment,¹ is a problem across the continuum of medicine. Evidence suggests that burnout may peak during residency and fellowship along with increasing levels of depersonalization.²⁻⁴ This is particularly concerning given that depersonalization has been associated with worse patient outcomes.^{5,6} Moreover, burnout has been found to be worse in "front lines" specialties, including emergency medicine (EM)⁷⁻⁹ where prevalence of burnout has been estimated to be as high as 65%¹⁰ to 76%¹¹ among US EM residents. Studies on resident burnout rates in other medical specialties, when compared with those study findings, suggest that emergency medicine residents have among the highest rates of burnout.¹² Burnout in the physician population has been well-described; it negatively impacts individual wellbeing, the quality of patient care, and financial costs to organizations.¹³

These findings have led to a number of initiatives to explore contributing and mitigating factors both within medicine at large and within EM. These factors are found to fall into two umbrella categories: individual and organizational. Organizational level factors include excessive workload, work inefficiency, lack of work-home integration, loss of control and autonomy, and loss of meaning from work.⁷ Additionally, relationships between the team members and social support at work have been identified as important factors influencing burnout.^{14, 15} Individual factors contributing to burnout appear to have more variation and include sex, age, educational debt, relationship status, age of children, and spouse or partner occupation.^{2, 7, 10, 16} Adequate social support at the individual level is also associated with decreased levels of burnout.^{15, 17}

A natural response to these results has been a call for robust, multifaceted well-being programs. A meta-analysis of interventions to promote physician well-being found that efforts focused on both the individual and organization or structural levels have been effective for reducing burn out, and both approaches are likely necessary to develop sustainable programs.¹⁸ However, evidence on the efficacy of specific interventions is lacking.¹⁸⁻²⁰

Among other efforts to promote well-being, the EM program at our institution holds semi-annual retreats for residents and faculty aimed at building social and community connectedness. We aimed to evaluate the efficacy of this specific intervention. We hypothesized that residency level; group retreats would improve or help maintain low levels of resident burnout and increased well-being as measured by serial administration of the Maslach Burnout Index (MBI) and a resident well-being survey (RWS).

Methods

Standardized guidelines for survey studies were followed²¹⁻²³ and a protocol was written prior to the initiation of the research process.

Target Population

Our training program is a three-year Emergency Medicine program with 8 residents per year. The program recently expanded to 9 residents per year and the intern class for the Fall 2018 and Winter 2019 consisted of 9 residents (which occurred during the study period). The residents spend the bulk of their clinical curriculum in the emergency department but also do clinical rotations in Obstetrics and Gynecology, Hand Surgery, Orthopedic trauma, Anesthesia, Pediatric intensive care unit, surgical intensive care unit, Psychiatry, Emergency Medical Services and emergency ultrasound. The educational curriculum consists of 5 hours per week. Approximately 20% of educational curriculum is delivered through simulation.

Furthermore, the residency program has a research and quality improvement requirement. As residents advance from year to year there is an expectation of progressive responsibility and accountability with the expectation that the third year residents are able to lead, manage and supervise their clinical area.

Resident progress and performance is assessed on a semi-annual basis. Semi-annual reviews are based on the ACGME milestones.

IRB Approval

IRB approval was obtained prior to the initiation of this research study.

Informed Consent

Residents were asked to consent on the first page of the survey. Only those who consented answered the questions. Completing the survey was voluntary. All residents could participate in the retreats regardless of completion of the surveys.

Data Protection

Data were securely stored in a password-protected server. Because of the sensitive nature of the responses, data were collected anonymously. However, the IRB requested that one team member have access to identified data if needed. The residents and medical student working on this project did not have access to identifiers. One faculty member had access to individual answers in case a resident with severe burnout was identified.

Development and Training

The MBI is a validated tool for assessing burnout. A license to administer the MBI Human Services Survey adapted for Medical Personnel and the interpretation manual were purchased.

The MBI evaluates three subscales including; are emotional exhaustion, depersonalization and personal accomplishment. Emotional exhaustion (EE) measures feelings of being emotionally overextended and exhausted by one's work; depersonalization (DP) measures an unfeeling and impersonal response toward patients; and personal accomplishment (PA) measures feelings of competence and successful achievement in one's work. It is a 22-item survey with 9 items measuring emotional exhaustion, 5 items measuring depersonalization, and 8 items measuring personal accomplishment.¹ Scoring of subcategories range from 0-54, 0-30, and 0-48 for emotional exhaustion, depersonalization, and personal accomplishment respectively. Each subcategory is considered individually and should not be combined. Categorizing each subcategory as low, medium, or high levels is not recommended.²⁴ However; scores at the top end of the range of emotional exhaustion and depersonalization suggest higher levels of symptoms. Higher personal accomplishment scores represent a higher sense of personal accomplishment. A "high" score in the category of emotional exhaustion (≥ 27) or depersonalization (≥ 10) is commonly used to determine burnout.^{2, 3}

The RWS (see additional file 1) was modeled after surveys validated to measure well-being among medical professionals.^{1, 25} Team members met with staff from our institution's survey research center to discuss, evaluate, and receive feedback regarding the survey.

Piloting

The questions for the RWS were tested with healthcare providers other than EM residents (e.g. medical students, off service residents rotating in the ED, and EM faculty). Data in the study is not from the pilot phase of the study. The questions for the RWS were distributed for feedback purposes only to refine the survey and not evaluated in the study or included in this manuscript. The pilot phase was suggested by our survey center and we asked learners not in our training program to review the survey for feedback and modification purposes. The nine learners who provided feedback on the survey did not participate in the retreats and therefore were not included in the dataset of this manuscript.

Refinement

Feedback from the piloting was used to edit and refine the RWS survey. The questions were modified to reflect residents preferred language and match the interventions. With support from the survey research center, usability and technical functionality of the electronic questionnaire was tested before deployment of the questionnaire.

Recruitment Process and Contact Mode

Residents were contacted by email by a co-resident to avoid any perceived coercion from residency leadership. Up to two reminders were sent for each administration of the survey (e.g. baseline, pre-retreat, and post-retreat). No monetary compensation was offered to participants.

Sampling

This study included a non-random sample of participants following purposive sampling, where a specific population was identified and only its members were included in the survey.

Survey Administration

The MBI survey was administered using REDCap and the RWS using SurveyMonkey. The MBI survey was administered via an electronic link to all EM residents (n=25) in July 2018 to establish a baseline. Both MBI and RWS surveys were repeated before and after the fall 2018 and winter 2019 retreat.

Intervention

The intervention evaluated were in-person retreats, each lasting one half-day. The fall 2018 retreat included a casual meal as well as team building activities and social network opportunities such as bowling and softball. The winter 2019 retreat included a casual meal and outdoor winter activities such as snow tubing and sledding.

Data Collection

Data were collected in REDCap and SurveyMonkey and exported for analysis.

Data Analysis and Statistical Methods

Criteria for burnout was defined by a high score in either EE (≥ 27) or DP (≥ 10) as is common among other studies using the MBI to evaluate physicians.^{2, 3} Survey responses were classified as baseline (7/13/2018-7/23/2018), pre-fall retreat (8/21/2018-9/4/2018), post-fall retreat (9/5/2018-9/12/2018), pre-winter retreat (1/28/2019-2/4/2019) and post-winter retreat (2/5/2019-2/20/2019). Continuous features were summarized with means and standard deviations (SD); categorical features were summarized with frequency counts and percentages. Comparisons of responses between baseline and pre-retreat, pre- and post-retreat, and baseline and post-winter retreat were evaluated using two-sample t, Wilcoxon rank sum, and Fischer exact tests. Statistical analyses were performed using SAS version 9.4 (SAS Institute; Cary, NC). All tests were two-sided. P-values < 0.05 were considered statistically significant.

Results

Respondents were all residents in the Mayo Clinic EM residency program. Select demographic information is summarized in Table 1. Figure 1 and Table 2 summarize responses to the MBI. Table 3 summarizes responses to the RWS. Sixteen residents (64%) responded to the baseline administration of the MBI. Three of 16 (19%) respondents exhibited evidence of burnout at baseline.

Table 1. Summary of Demographic Data of the Emergency Medicine Residency Program

Demographic Variable	Total Program (N = 25)
Female	10
Level of Training, n (%)	
Post-Graduate Year 1	9 (36)
Post-Graduate Year 2	8 (22)
Post-Graduate Year 3	8 (22)

Figure 1. Mean MBI Scores from July 2018 to February 2019. There were 5 total administrations of the MBI. Subscores for emotional exhaustion and depersonalization were trended over time. (MBI = Maslach Burnout Index)

Table 2. Summary of responses to MBI.

MBI	Baseline	Pre-fall	Post-fall	Pre-winter	Post-winter	P ¹	P ²	P ³	P ⁴	P ⁵
Responses, n (%)	16 (64)	21 (84)	16 (64)	14 (56)	16 (64)					
Scores, mean (SD)										
Emotional exhaustion	13 (7)	13 (8)	9 (7)	12 (9)	12 (10)	0.90	0.19	0.71	0.95	0.78
Depersonalization	7 (5)	7 (5)	5 (3)	8 (6)	6 (4)	0.92	0.11	0.41	0.19	0.56
Personal accomplishment	41 (6)	40 (6)	41 (6)	41 (6)	43 (3)	0.69	0.54	0.95	0.41	0.36
Burnout, n (%)	3 (19)	6 (29)	1 (6)	5 (36)	2 (13)	0.70	0.11	0.42	0.20	1.0

Response rate to each survey and mean subscore for each MBI component were calculated. Percentage of respondents meeting criteria for burnout was defined by a high score in either EE (≥ 27) or in DP (≥ 10).^{2,3} Comparisons were made between multiple time points: P¹ = baseline to pre-fall, P² = pre-fall to post-fall, P³ = baseline to pre-winter, P⁴ = pre-winter to post-winter, P⁵ = baseline to post-winter. (MBI = Maslach Burnout Index)

Fall Retreat

There were 21 (84%) and 16 (64%), respondents for the pre- and post-fall retreat MBI administrations, respectively. Mean MBI subscores for emotional exhaustion were the same (13) from baseline to pre-retreat and decreased from pre- to post-retreat (13 to 9, $p=0.19$). Depersonalization decreased from pre- to post-retreat (7 to 5, $p=0.11$). The percentage of residents meeting criteria for burnout increased from 19% at baseline to 29% during the pre-fall period. This decreased to 6% during the post-fall period. No statistically significant differences in burnout were found between baseline and pre-fall or between pre- and post-fall MBI administrations.

Nineteen (76%) and 20 (80%) residents responded to the pre- and post-fall RWS administrations, respectively. The majority of residents responded agree or strongly agree to all items (95% to 100%). Five percent of respondents reported disagreement with statements 2 through 5 on pre-fall, post-fall, or both surveys. No statistically significant differences were found between pre- and post-retreat responses on any item ($p= 1.0$).

Table 3. Summary of Responses to the RWS.

RWS	Pre-fall	Post-fall	Pre-winter	Post-winter
Responses, n (%)	19 (76)	20 (80)	17 (68)	14 (56)
Agree/Strongly Agree (%)				
1. I feel that my residency program cares about me as a person.	100	100	100	100
2. I feel that my residency program encourages my development.	100	95	94	93
3. I feel valued at work.	95	95	100	100
4. I feel valued by my co-workers.	95	95	100	100
5. I feel cared for.*	95	100	100	100

The RWS was administered to all EM residents in the program before and after the fall 2018 and winter 2019 retreats to evaluate for emotional and relational aspects of being a resident. (RWS = Resident Well-Being Survey) * For all administrations of RWS, $p=1.0$ between responses pre- and post-retreat.

Winter Retreat

There were 14 (56%) and 16 (64%) respondents to the pre- and post-winter retreat MBI administrations, respectively. Mean MBI subscores for EE were similar between baseline and pre-winter retreat (13 to 12, $p=0.71$) and the same between pre- and post-winter retreat (12, $p=0.95$). Depersonalization was similar between baseline and pre-winter retreat (7 to 8, $p=0.41$) and decreased from pre- to post-winter retreat (8 to 6, $p=0.19$). While only 6% of resident respondents demonstrated burnout after the fall retreat, this increased to 36% in the pre-winter retreat period and decreased to 13% post-winter retreat. No statistically significant differences in burnout were identified between baseline and pre-winter or pre- and post-winter MBI administrations.

There were 17 (68%) and 14 (56%) respondents to the pre- and post-winter retreat RWS administrations, respectively. The majority of residents responded agree or strongly agree to all questions (93% to 100%). One of 17 (6%) pre-winter retreat and one of 14 (7%) post-winter respondents disagreed with the statement: "I feel that my residency program encourages my development." No statistically significant differences were found between pre- and post-winter retreat responses on any item ($p = 1.0$).

Baseline to Post-Winter Retreat

Over the entire study period from July 2018 to February 2019, mean MBI subscores for EE (13 to 12, $p=0.78$) and for DP (7 to 6, $p=0.56$) remained similar. At baseline, 19% of resident respondents met criteria for burnout. Following the winter retreat, 13% did ($p=1.0$).

Resident Commentary

Free-responses were also obtained as a part of the survey process. Residents commented that the most liked aspects of the retreats included dedicated time for bonding with peers and faculty as well as socializing outside of a clinical setting. Least liked aspects of the retreats included the weather (i.e. rain, cold temperatures) and scheduling, particularly for residents working night shifts before or after the retreat. Other comments mentioned that the retreats were too short.

Discussion

This single center survey evaluated the effects of retreats on resident well-being. Overall, levels of burnout were low and well-being was high among residents. Several important trends were noted; however, because of our small sample size, these results were not statistically significant. Mean DP scores decreased after each retreat and the number of residents meeting criteria for burnout decreased following each retreat. This suggests that retreats may target DP more than EE as a mechanism of decreasing burnout. While this study does not show prevention of burnout, levels of burnout decreased after each retreat. This suggests retreats may be a useful intervention for acutely decreasing levels of DP and improving burnout among EM residents. Resident sense of well-being, as measured by the RWS, remained consistent both pre and post retreat. This might be secondary to high levels of resident well-being seen at baseline, the multifactorial and complex nature of well-being, and the short length of our intervention.

While the MBI score has three subscales, studies have found EE and DP are most informative with regard to burnout among physicians.^{1, 2, 6} Thus; burnout was defined by high scores in either of these domains. In this study, 19% of respondents met criteria for burnout at baseline and levels of burnout peaked at 36%. These values are significantly lower than previously reported levels of burnout among EM residents of greater than 60%^{10, 11} and among residents across various specialties of 44-76%.^{2, 3, 6, 26}

To further characterize the effect of retreats, we explored the subcategories of the MBI. Mean PA scores were consistently high, and similar to previously reported data.^{3, 27} Mean EE trended down from baseline to post-fall retreat, but when looked at over the entire study period remained similar. Mean EE values were lower for our study group than those previously reported.^{3, 27} Resident levels of DP decreased after each retreat, though levels did not change significantly over the study period. We can surmise that the retreat's effect on DP contributed to decreased percentages of burnout among our EM residents. This trend is consistent with interventions among other specialties showing decreased DP scores.^{18, 28} Additionally, it is worth reiterating that DP has been associated with worse patient outcomes. Thus, resident retreats aimed at improving social interactions may be valuable. Over the entire study period emotional

exhaustion and depersonalization remained stable. A small decrease in burnout was found between baseline and post winter retreat assessments.

While often colloquially used interchangeably, a distinction can be made between the terms burnout and well-being. Burnout is defined as a state encompassing feeling of emotional exhaustion, depersonalization, and reduced sense of personal accomplishment.¹ The definition of well-being is less agreed upon. A critical component of well-being may include lack of burnout, but there are likely other important contributing factors.^{13, 29} We utilized the RWS to explore additional factors of well-being such as the emotional and relational aspects of residency. The majority of residents agreed or strongly agreed with statements regarding feeling valued and feeling cared for by the residency program. However, following each retreat, there was a downtrend in agreement with the statement regarding feeling as though the residency program encourages development. This finding is difficult to explain, though may offer a future avenue for improving resident well-being through focused mentorship.

As a component of the RWS resident respondents were invited to provide feedback about the retreats. Most comments revolved around the same theme: residents valued dedicated time for socialization with both their peers and faculty in a non-medical context. Some residents had difficulty in attending the retreats due to scheduling (i.e. working the night before or after the retreat). These findings are consistent with a previous study that found that having a supportive work environment, social gatherings, and mentorship were associated with decreased burnout.¹⁵

The vast majority of survey respondents at all time points responded that they agreed or strongly agreed with the statements in the RWS. Not a single study participant recorded a response of strongly disagree at any time point during the investigation. Furthermore, only 8 participants recorded a response of disagree at any time point. As such, the overarching results of the RWS suggest our EM residents are satisfied with and have a high level of overall well-being. This is consistent with our findings of lower than average percentages of burnout. In this investigation we did not assess factors that may have attributed to our EM residents high level of overall well-being at baseline. If we had to speculate the reasons for a higher level of overall well-being we would base it on feedback that has been provided to the program leadership during and preceding the investigation. Based resident feedback resident well-being has high secondary to the smaller size of the program that creates a close knit group, program leadership that focus on establishing and maintaining trust, an emphasis on resident input that is used to shape the training program, a supportive atmosphere in the program with support for resident well-being, responsiveness to resident concerns, and accessibility of the program leadership and faculty.

We did not find a significant variation in burn out in the pre and post winter and fall semesters. This may be because the resident retreats are strategically planned in early Fall and Mid- Winter. The observation of the program leadership at the time of the retreat development where these are “equally low points in the year”. Summer is a particularly busy time in our department with high volumes of patients. The

summer is also a time of transition for the residents and with transition to a higher post-graduate year comes increased responsibility and expectations. The winters in Minnesota are often long and harsh and can be mentally tough on trainees.

Limitations

The study was limited by the small sample size and response rates, which may have prevented detection of subtle changes in burnout and well-being. Additionally, the percentage of respondents exhibiting burnout should be interpreted carefully, as they do not represent all residents in the program. It is possible that residents with less burnout were more likely to respond, creating biased results. As the residents were surveyed at different time points in the year, this may have a confounding effect on levels of burnout. Levels of experience and responsibility often increase as the academic year progresses, and seasonal fluctuations in patient volume may contribute to variances in resident stress and workload. Moreover, because data were collected anonymously, we were not able to link participants across time points, which may have provided more specific data. These factors may limit the generalizability of the study. Furthermore, our study was not designed to evaluate other factors such as workload, patient volume, or other stresses on burnout but was focused on the effects a retreat may have on burnout. Further investigation is needed to assess the effect other factors play in burnout.

Conclusions

While changes in MBI and RWS scores following retreats were not statistically significant, promising trends were noted. Mean EE decreased post-fall retreat while mean DP and burnout decreased after each retreat. While this study does not show prevention of burnout, the trend suggests that in-person retreats may be a useful intervention for acutely decreasing burnout among EM residents; specifically the subscale of DP. Larger scale studies powered to detect subtle changes would provide further insight into the significance of these trends.

List Of Abbreviation

DP = depersonalization

EE = emotional exhaustion

EM = emergency medicine

MBI = Maslach burnout index

PA = personal accomplishment

RWS = resident well-being survey

SD = standard deviation

Declarations

Ethics approval and consent to participate

This study was approved by the Institutional Review Board and was determined to be exempt.

Consent for publication

Not applicable.

Availability of data and materials

The datasets generated and/or analysed during the current study are not publically available due to the need to protect anonymity of the subjects, but are available from the corresponding author on reasonable request. Maslach Burnout Index and interpretation guide can be purchased for use at mindgarden.com

Competing Interests

The authors declare that they have no competing interests.

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Authors' contributions

All authors contributed to the study design. SH and ES implemented the intervention and developed the resident wellness survey. CL provided data analysis. KM interpreted the data and prepared the initial manuscript. All authors provided critical revisions. All authors read and approved the final manuscript.

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Not applicable.

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Additional Files

Additional File 1

File format: .docx

Title of data: Resident Well-Being Survey

Description of data: Includes survey provided to residents to evaluate for emotional and relational aspects of being a resident.

Figures

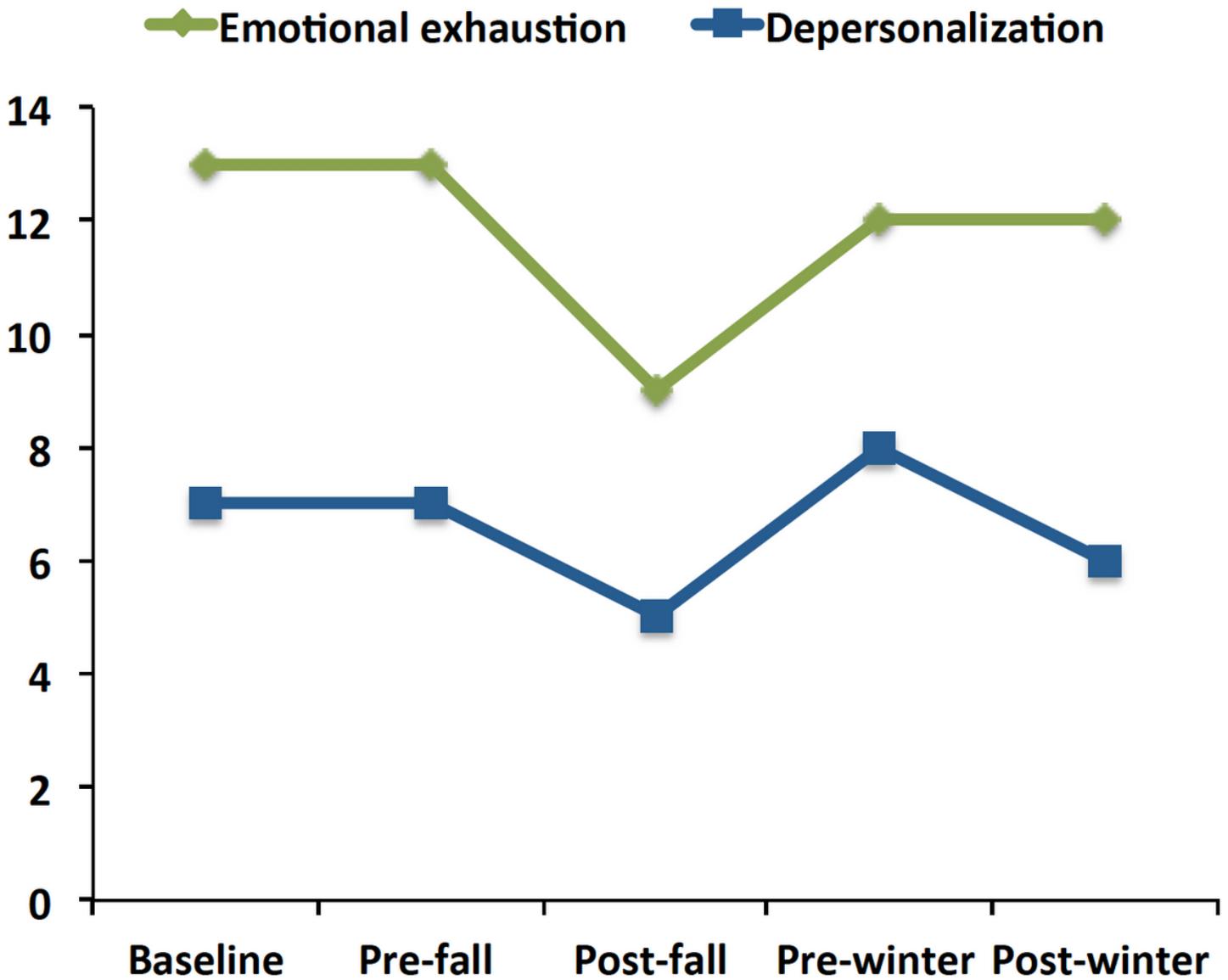


Figure 1

Mean MBI Scores from July 2018 to February 2019. There were 5 total administrations of the MBI. Subscores for emotional exhaustion and depersonalization were trended over time. (MBI = Maslach Burnout Index)

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [4Additionalfile12.docx](#)