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ORIGINAL RESEARCH

# Physician Leadership and Its Effect on Physician Burnout and Satisfaction During the COVID-19 Pandemic

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**Purpose:** Physician burnout is a global issue associated with low job satisfaction, decreased quality of patient care, reduced productivity, and early retirement from clinical practice. We sought to evaluate the impact of the leadership qualities of direct physician supervisors on the burnout and professional satisfaction of the physicians they supervise.

**Methods:** An online survey was distributed by Email to all staff physicians practicing at a large Canadian academic tertiary care hospital. The primary outcome was the prevalence of burnout and professional satisfaction, assessed using the 2-item Maslach Burnout Inventory and a single item 5-point Likert scale rating, respectively. The secondary outcome was the relationship between composite leadership score and burnout/satisfaction, with leadership assessed by the 12-item Mayo Clinic Participatory Management Leadership Index.

**Results:** Out of the 1176 physicians surveyed, 383 (32.6%) responded (51.2% male; 41.5% female). Overall, 41.7% of physicians reported at least one symptom of burnout (40.0% reported high emotional exhaustion; 15.3% reported high depersonalization). 40.1% of physicians reported being satisfied with the organization, 26.3% were neutral, and 33.6% were dissatisfied. On multivariate analysis adjusting for age, sex, duration of employment at the institution, and specialty, each one-point increase in composite leadership score was associated with a 3.1% decrease in the likelihood of burnout ($p = 0.0017$), and a 6.6% increase in the likelihood of satisfaction ($p < 0.0001$).

**Conclusion:** Physician burnout is prevalent and positive leadership qualities of direct supervisors decreases the likelihood of burnout in physicians and increases the likelihood of their satisfaction with the organization.

**Trial Registration:** ClinicalTrials.gov; Identifier: NCT04896307.

**Keywords:** physician wellness, burnout, satisfaction, leadership

## Introduction

Physician burnout is a global issue characterized by emotional exhaustion, depersonalization, and low levels of personal accomplishment.[1] Burnout symptoms as high as 50% have been documented worldwide[2–6] and according to the 2021 National Physician Health Survey, it is experienced by 53% of Canadian physicians and resident physicians.[7] This can have devastating consequences on physician health[8–10] and is associated with low job satisfaction,[11,12] decreased patient satisfaction[13–16] and quality of care,[17–21] reduced productivity, high job turnover, and early retirement from clinical practice.[22–24] Healthcare expenditures are also indirectly affected by higher rates of medical errors,[12,13,23,25] absenteeism, and lower job productivity,[22,24] leading to an estimated cost burden ranging from $168.2 million to $252.4 million in Canada.[23] Numerous factors drive physician burnout including heavy workloads, staff shortages, inefficiencies of Electronic Health Record (EHR) systems, administrative burden, and high patient volume.[26,27]

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A number of studies have been published stating the high rates of stress and burnout of physicians within our Canadian tertiary care centre including during the implementation of a new EHR in the months preceding the COVID-19 pandemic.[28] Furthermore, physicians within our healthcare facility have expressed difficulties with maintaining their wellness in the face of individual and organizational challenges.[8,29] During the height of the pandemic in our Canadian tertiary care center, physicians faced added organizational stressors including the implementation of PPE requirements and new safety procedures, changes in clinical directives, visitor restrictions, reduced support staff and resources, and a rapid shift to virtual care, which could lead to moral distress if providers felt it compromised patient care. For those in surgical specialties, frequent operating room closures contributed to ever-increasing waitlists, and a potential decrease in income given the fee-for-service model in our organization. This was all in the backdrop of the province of Ontario, Canada, releasing the Adult Critical Care Clinical Emergency Standard of Care for Major Surge (Emergency Standard of Care [ESoC]) in 2021, a triage framework to guide the allocation of critical care resources in the expectation that intensive care units would be overwhelmed.[30]

Evidence suggests that burnout is reversible and even preventable.[31] Both organization-directed and physician-directed interventions have been shown to result in meaningful reductions in burnout among physicians.[32,33] Recently, the importance of organizational structures and environment,[34–37] has been highlighted as having a significant effect on the health of the physician, the patient, and the organization.[12,20,34,35] Leadership in particular has a profound impact on reducing burnout and promoting job satisfaction.[36–39] A recent study by Shanafelt and colleagues performed at the Mayo Clinic in the United States, found that positive leadership qualities of direct physician supervisors decrease the likelihood of burnout and increases satisfaction in the physicians they supervise.[12]

The results of this study underscore the importance of leadership as a modifiable factor to address physician burnout, however, to our knowledge there are no studies that examine this relationship in a Canadian healthcare setting. Given significant differences between American and Canadian healthcare systems, including the publicly funded and a fee-for-service physician renumeration model of the Canadian system,[40] it is important to assess the validity of these results in this setting. Moreover, the COVID-19 pandemic introduced many new organizational stressors,[41–43] offering valuable insight into the impact of leadership during highly stressful periods. This context allows for the unique opportunity to investigate whether positive leadership qualities contribute similarly to physician well-being in spite of the larger socioeconomic and political factors that impacted healthcare delivery during this period.

Our study objectives were first, to assess the prevalence of burnout and professional satisfaction of physicians working at a large Canadian academic tertiary care hospital during the COVID-19 pandemic and second, to evaluate the relationship between the leadership qualities of direct physician supervisors and the well-being and burnout of their physicians during this time.

# Materials and Methods

## Study Design

We conducted a cross-sectional online survey study targeting all staff physicians at a large Canadian academic tertiary care hospital between May 2021 and February 2022, during the COVID-19 pandemic. We sought to replicate the design of Shanafelt and colleagues' study conducted at the Mayo Clinic.[12] This large academic health sciences system consists of three campuses (1 ambulatory care and 2 tertiary care sites) and over 12,600 employees, physicians, and trainees.

Study recruitment involved a two-step process. First, one of the study authors attended a meeting for each division within the hospital (or department meeting, without separate divisions within a department) to give a 10-minute presentation on the study's objectives. Second, on the day following the presentation, an Email with a link to the survey was sent to every physician member of that division/department by the administrator responsible for that mailing list. Follow-up reminder emails were sent at one and two weeks following the email, for a total of three emails. This was completed for 42 of the 44 divisions/departments. Our survey was hosted by LimeSurvey, with all appropriate licensing, and was piloted to ensure functionality before launch.

This study was approved by the Ottawa Health Science Network Research Ethics Board (REB#20200431-01H) and complies with the Declaration of Helsinki. Implied consent was obtained from participants by completing the survey

following provision of information regarding the purpose of the study, time involved, risks/benefits, withdrawal, and confidentiality.

## Survey

The survey consisted of 19 questions over 9 pages: 4 demographic questions, 12 questions rating the leadership qualities of their direct supervisor, 2 questions assessing burnout, and 1 question regarding overall satisfaction with the hospital. The survey was voluntary and anonymous. We enabled backwards navigation so respondents could review their responses and used cookies to prevent repeat participation. This study is reported as per the Checklist for Reporting Results of Internet E-Surveys (CHERRIES).[44]

## Demographics

Respondents were asked for their sex, age, duration of employment, and to select the name of their immediate supervisor (ie, Division Head, Department Head, or Chief of Staff) from a drop-down menu. To account for potential recent changes in physician leader, instructions were given to evaluate the leader who was in position in December 2020.

## Leadership

We employed the 12-item Mayo Clinic Participatory Management Leadership Index[12,34,35,45,46] to assess the leadership qualities of respondents' immediate supervisor. This instrument was designed and validated by Shanafelt and colleagues to evaluate dimensions of leadership that drive engagement among team members.[34] For respondents who completed at least 9 out of 12 items, a total composite score was calculated by summing the items, with higher scores indicative of more effective leadership.

## Burnout

To assess burnout, we used the 2-item Maslach Burnout Inventory (MBI)[47–49] adapted from the original 22-item MBI.[1,50] This inventory uses single-item measures to assess the emotional exhaustion and depersonalization dimensions of burnout. Respondents indicated how often they experience these symptoms on a 7-point Likert scale (0=Never, 1=A few times a year or less, 2=Once a month or less, 3=A few times a month, 4=Once a week, 5=A few times a week, 6=Every day). A dichotomous burnout variable was determined by respondents with scores ≥4 on at least one of the two items.[12,34,35,45–48]

## Satisfaction

Overall satisfaction with the organization was assessed using a single item: "Considering everything, how would you rate your overall satisfaction with [name of the hospital] as a whole at the present time?". Responses were provided on 5-point Likert scale and were dichotomized into either dissatisfied or satisfied (respondents who answered "very satisfied" or "satisfied" with a organization).[12,35,45,46]

## Statistical Analysis

We calculated basic summary statistics with continuous variables and categorical variables summarized using means ± standard deviations and frequencies and percentages, respectively. Chi-squared tests of independence ($\chi^2$) and independent samples *t*-tests were used to compare categorical variables and continuous variables, respectively. Pearson correlation coefficients were calculated to assess relationships between leadership ratings and emotional exhaustion, depersonalization, and satisfaction. Two-sided tests were performed to assess if the linear relationship was statistically significant. We then performed two separate multivariate logistic regressions to evaluate the relationship between composite leadership score and the outcomes of burnout and satisfaction, respectively. In both models, we adjusted for age, sex, specialty, and duration of employment. Adjusted odds ratios (aOR) with 95% confidence intervals (95% CI) as well as *p* values are reported. To explore burnout and satisfaction at the division/department level, we first calculated the mean composite leadership score for each of the 34 division/department leaders with at least four evaluations (mean = 46.6 ± 7.0; range = 33.8–57.4) based on the collective rating of all responding physicians they supervised. Then we

evaluated the Pearson correlation coefficient between the mean composite leadership score and the prevalence of burnout and satisfaction for the division/department. All statistical analyses were conducted using SAS version 9.4 (SAS Institute, Cary, NC) and statistical significance was set at $p < 0.05$.

## Results

Of the 1176 physicians surveyed, 383 (32.6%) responded (51.2% male; 41.5% female). The participation rate was 383/398 (96.2%), and the completion rate was 358/383 (93.5%) (see Figure 1). Demographic characteristics and rates of burnout and satisfaction of respondents are presented in Table 1. Overall, 41.7% reported at least one symptom of burnout; 40.0% reporting high emotional exhaustion and 15.3% reporting high depersonalization. Collectively, 40.1% of physicians reported being either very satisfied or satisfied with the organization, 26.3% were neutral, and 33.6% were either dissatisfied or very dissatisfied.

Physicians' ratings of their leader in the 12 leadership dimensions assessed, and the mean scores in each dimension by burnout and satisfaction are shown in Supplemental Tables 1 and 2, respectively. All of the 12 dimensions demonstrated a statistically significant association with burnout and satisfaction. The prevalence of burnout and satisfaction in respondents rating their leader favourably (agree or strongly agree) and unfavourably (disagree or strongly disagree) in each of the leadership dimensions is shown in Table 2. Certain leadership dimensions were more strongly associated with burnout, including "My leader is interested in my opinion" ($p = 0.0006$), "empowers me to do my job" ($p = 0.0017$), and "recognizes me for a job well done" ($p = 0.0021$). There was a weak negative correlation between composite leadership score and both emotional exhaustion ($r = -0.206$, $p = <0.0001$) and depersonalization ($r = -0.176$, $p = 0.0009$) and a moderate positive correlation between composite leadership score and satisfaction ($r = 0.302$, $p = <0.0001$). This indicates that the higher the leadership score participants gave, the lower their emotional exhaustion and depersonalization, and the higher their level of satisfaction.

After adjusting for age, sex, specialty, and duration of employment, we found that each one-point increase in composite leadership score was associated with a 3.1% decrease in the likelihood of burnout (aOR: 0.969; 95% CI,

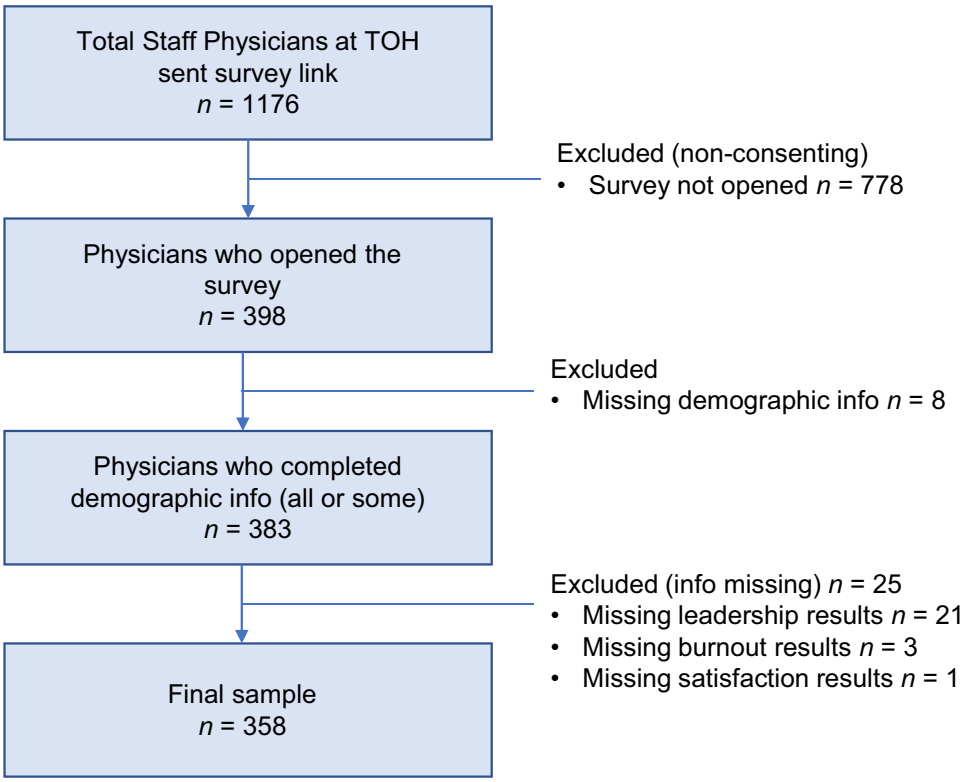


**Figure 1** Flow chart of study sample.

**Table 1** Demographic Characteristics, Burnout, and Satisfaction of the 383 Responders

| Characteristic | Responders [No. (%)] |
|---|---|
| **Age** | |
| < 35 y | 29 (7.6) |
| 35–44 y | 123 (32.2) |
| 45–54 y | 125 (32.7) |
| 55–64 y | 80 (20.9) |
| >65 y | 25 (6.5) |
| Missing | 1 |
| **Sex** | |
| Female | 159 (41.5) |
| Male | 196 (51.2) |
| Missing | 5 (1.3) |
| Prefer not to answer | 23 (6.0) |
| **Duration of Employment at Institution** | |
| <5 y | 69 (18.2) |
| 5–10 y | 91 (24.0) |
| 11–15 y | 67 (17.6) |
| 16–20 y | 52 (13.7) |
| 20–25 y | 53 (14.0) |
| >25 y | 48 (12.6) |
| Missing | 3 |
| **Specialty** | |
| Anesthesiology | 26 (6.8) |
| Emergency Medicine | 29 (7.6) |
| Family Medicine | 17 (4.4) |
| Critical Care | 4 (1.0) |
| Pathology and Laboratory Medicine | 22 (5.7) |
| Medicine | 149 (38.9) |
| OB/GYN | 30 (7.8) |
| Ophthalmology | 11 (2.9) |
| Ear, Nose, and Throat | 5 (1.3) |
| Medical Imaging | 24 (6.3) |
| Psychiatry | 8 (2.1) |

(*Continued*)

**Table 1** (Continued).

| Characteristic | Responders [No. (%)] |
|---|---|
| Surgery | 54 (14.1) |
| Other | 4 (1.0) |
| **Burnout** | |
| High Emotional Exhaustion[a] | 144 (40.0) |
| High Depersonalization[b] | 55 (15.3) |
| Burnout[c] | 150 (41.7) |
| Missing | 23 |
| **Satisfaction** | |
| Very satisfied | 27 (7.6) |
| Satisfied | 116 (32.5) |
| Neither satisfied nor dissatisfied | 94 (26.3) |
| Dissatisfied | 89 (24.9) |
| Very dissatisfied | 31 (8.7) |
| Missing | 26 |

**Notes:** [a]Symptoms of emotional exhaustion weekly or more often. [b]Symptoms of depersonalization weekly or more often. [c]High score (at least weekly) on the emotional exhaustion or depersonalization scale.

**Table 2** Leadership Qualities of Immediate Physician Supervisors and the Prevalence of Burnout and Satisfaction in Physicians They Supervise

| | Burnout (% [95% CI]) | | | Satisfaction (% [95% CI]) | | |
|---|---|---|---|---|---|---|
| **Leadership quality** | **Prevalence of those rating leader favourably** | **Prevalence of those rating leader unfavourably** | ***p* value*** | **Prevalence of those rating leader favourably** | **Prevalence of those rating leader unfavourably** | ***p* value*** |
| Holds career development conversations with me[a] | 37.4 (31.3–43.5) | 50.0 (38.1–61.9) | 0.0615 | 47.7 (41.3–54.1) | 19.1 (9.8–28.5) | <0.0001* |
| Inspires me to do my best[a] | 37.8 (31.4–44.1) | 55.6 (43.3–67.8) | 0.0114* | 49.8 (43.2–56.3) | 16.1 (7.0–25.3) | <0.0001* |
| Empowers me to do my job[a] | 36.9 (30.7–43.0) | 59.0 (46.7–71.4) | 0.0017* | 51.1 (44.7–57.5) | 11.5 (3.5–19.5) | <0.0001* |
| Is interested in my opinion[a] | 36.6 (30.7–42.5) | 60.7 (48.4–72.9) | 0.0006* | 47.8 (41.7–54.0) | 13.1 (4.6–21.6) | <0.0001* |
| Encourages employees to suggest ideas for improvement[a] | 38.0 (32.2–43.9) | 50.0 (35.2–64.8) | 0.1329 | 46.2 (40.1–52.2) | 20.5 (8.5–32.4) | 0.0014* |
| Treats me with respect and dignity[a] | 39.1 (33.5–44.7) | 48.7 (32.5–64.8) | 0.2647 | 45.5 (39.7–51.2) | 21.6 (8.4–34.9) | 0.0057* |

(*Continued*)

**Table 2** (Continued).

| | Burnout (% [95% CI]) | | | Satisfaction (% [95% CI]) | | |
|---|---|---|---|---|---|---|
| **Leadership quality** | **Prevalence of those rating leader favourably** | **Prevalence of those rating leader unfavourably** | ***p* value*** | **Prevalence of those rating leader favourably** | **Prevalence of those rating leader unfavourably** | ***p* value*** |
| Provides helpful feedback and coaching on my performance[a] | 36.2 (29.3–43.0) | 47.8 (36.0–59.6) | 0.0900 | 50.8 (43.6–58.0) | 20.6 (11.0–30.2) | <0.0001* |
| Recognizes me for a job well done[a] | 34.9 (29.0–40.9) | 57.1 (44.2–70.1) | 0.0021* | 50.6 (44.4–57.0) | 10.9 (2.7–19.2) | <0.0001* |
| Keeps me informed about changes taking place at [Institution Name][a] | 38.1 (32.5–43.7) | 63.6 (43.5–83.7) | 0.0182* | 47.0 (41.1–52.6) | 22.7 (5.2–40.2) | 0.0284* |
| Encourages me to develop my talents and skills[a] | 37.1 (30.9–43.4) | 49.1 (35.6–62.5) | 0.1089 | 51.1 (44.6–57.6) | 13.2 (4.1–22.3) | <0.0001* |
| I would recommend working for my immediate supervisor[a] | 37.0 (31.0–43.0) | 58.6 (46.0–71.3) | 0.0026* | 49.6 (43.3–55.9) | 14.0 (5.0–23.1) | <0.0001* |
| Overall, how satisfied are you with your immediate supervisor[b] | 36.6 (30.6–42.5) | 61.7 (49.4–74.0) | 0.0004* | 51.0 (44.8–57.3) | 11.9 (3.6–20.1) | <0.0001* |

**Notes**: [a]Response options: 5=strongly agree, 4=agree, 3=neither agree nor disagree, 2=disagree 1=strongly disagree, NA=do not know/not applicable. [b]Response options: 5=very satisfied, 4=satisfied, 3=neither satisfied nor dissatisfied, 2=dissatisfied, 1=very dissatisfied. *Denotes statistical significance ($p < 0.05$).

1.2–5.0, $p = 0.0017$), and a 6.6% increase in the likelihood of satisfaction (aOR: 1.066; 95% CI, 4.1–9.2, $p < 0.0001$) (Figure 2). At the department level (see Figure 3), a weak negative correlation ($r = -0.371$, $p = 0.0474$) was found between the mean composite leader rating and the rate of burnout. No relationship was observed between mean leadership score and the rate of satisfaction ($r = 0.199$, $p = 0.300$).

## Discussion

We employed an online survey to assess the prevalence of burnout and satisfaction of physicians at a large Canadian academic tertiary care hospital, and to evaluate the relationship between the leadership qualities of direct physician supervisors and the well-being of their staff. Overall, 41.7% of respondents reported at least one symptom of burnout and 33.6% were either dissatisfied or very dissatisfied with the organization. After adjustment, each one-point increase in the composite leadership score of supervisors was associated with a 3.1% decrease in the likelihood of burnout, and a 6.6% increase in the likelihood of satisfaction in the physicians they supervised. Our study further substantiates the prevalence of burnout among physicians and is the first example of research supporting the relationship between leadership quality and physician burnout and satisfaction in a Canadian healthcare setting.

Overall, the prevalence of burnout in our study was similar to a recent report on Canadian physicians (52%)[7] and a study on academic physicians in a Canadian hospital (49%).[8] Our findings related to leadership and burnout and satisfaction paralleled those of Shanafelt et al's Mayo Clinic study[12] closely, with each one-point increase in leadership score reducing the likelihood of burnout by 3.1% (vs 3.3% in Shanafelt's work) and increasing satisfaction by 6.6% (compared to their 9.0%). Although our study's lower response rate necessitates cautious interpretation, these results offer preliminary support for the generalizability of the leadership-burnout and leadership-satisfaction relationships to the Canadian healthcare landscape. This is true despite important contextual differences between Canadian and American

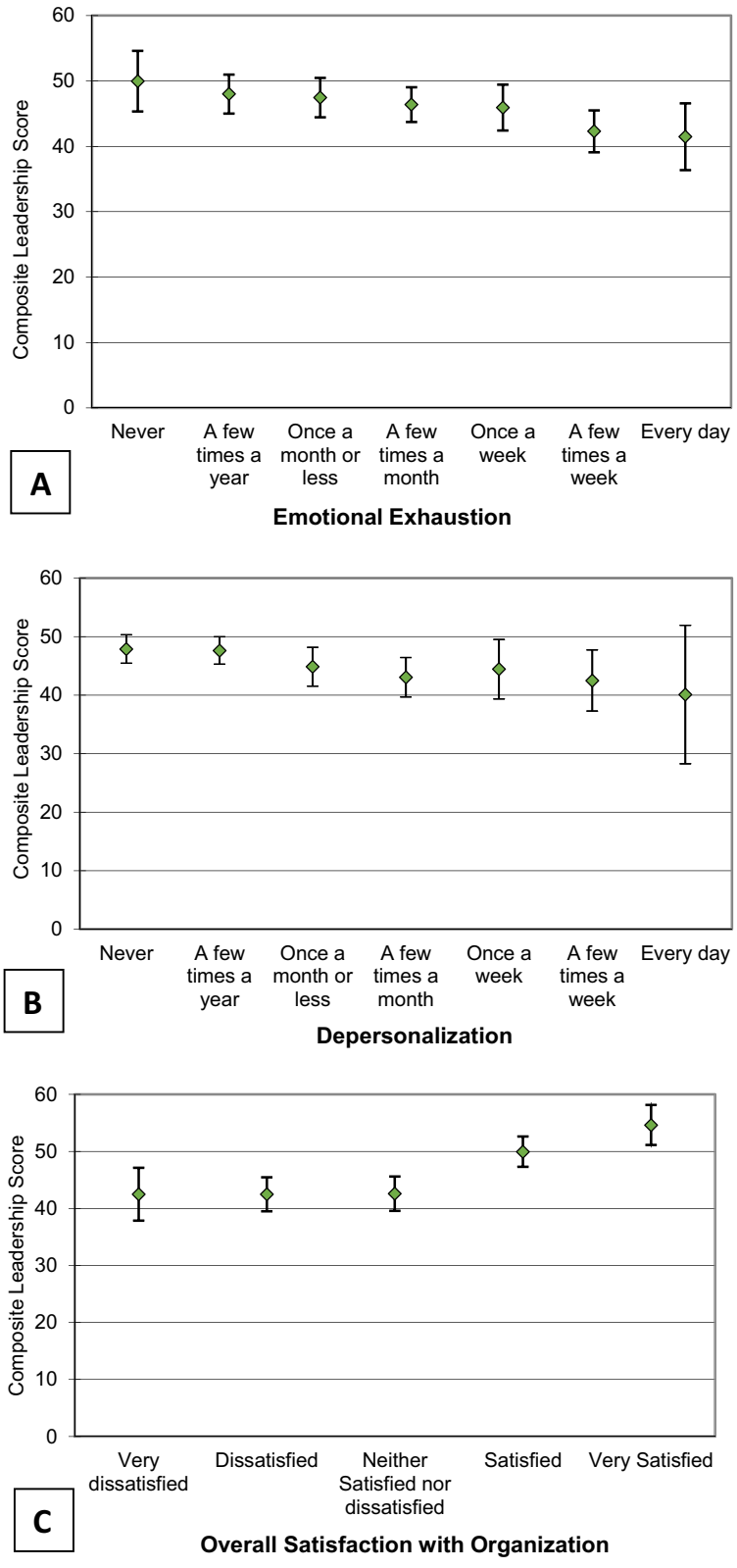


**Figure 2** Relationship between mean composite leadership score and burnout and satisfaction. **(A)** Relationship between mean composite leadership score of the immediate supervisor and physician emotional exhaustion (correlation coefficient = −0.206, $p < 0.0001$). **(B)** Relationship between mean composite leadership score of the immediate supervisor and physician depersonalization (correlation coefficient = −0.176, $p < 0.001$). **(C)** Relationship between mean composite leadership score of the immediate supervisor and physician and satisfaction (correlation coefficient = 0.302, $p < 0.0001$). Error bars indicate 95% CI.

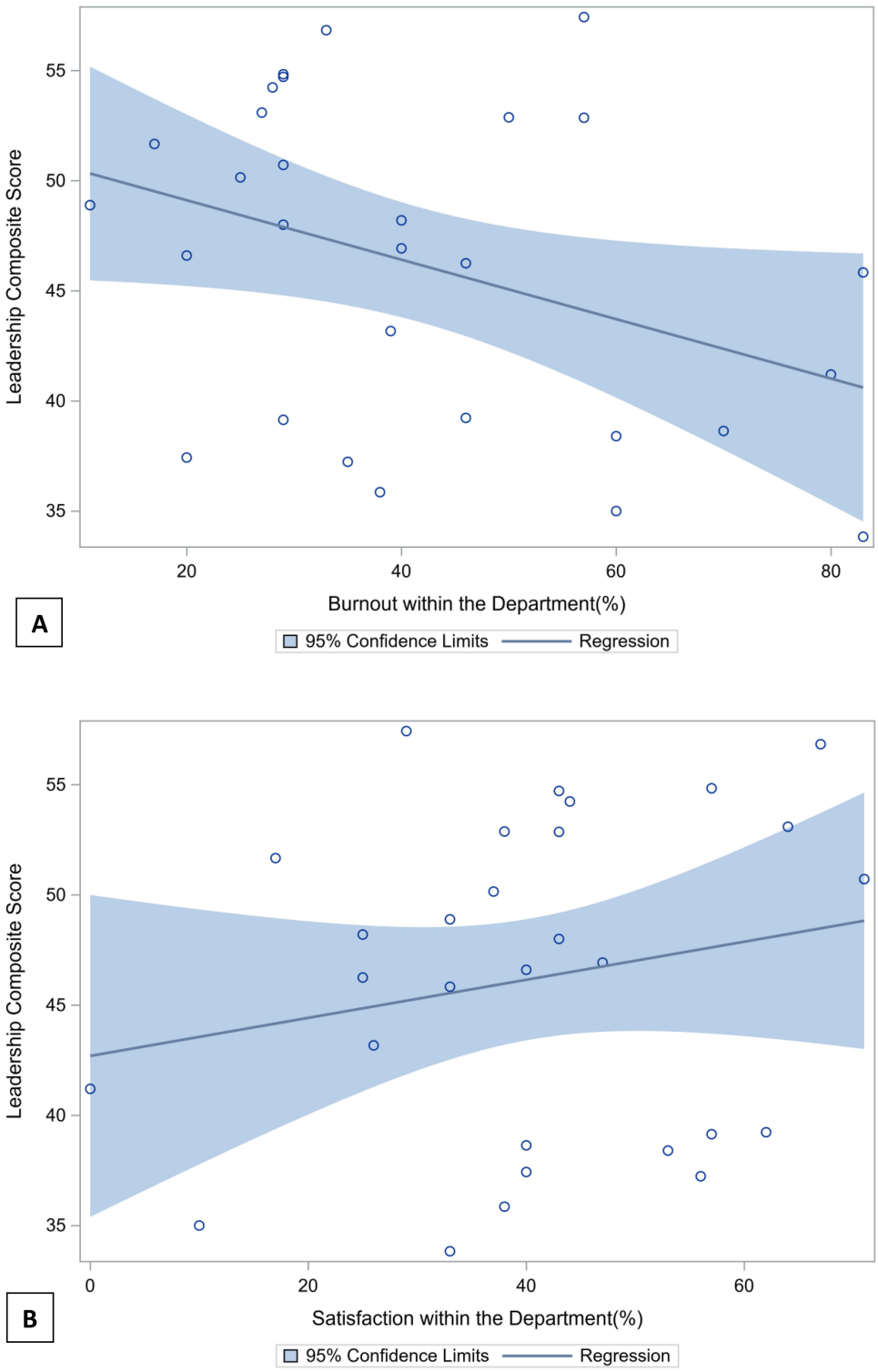


**Figure 3** Composite leadership score and rate of burnout and satisfaction at the division/department level. (**A**) Mean composite leadership score and rate of burnout at the division/department level (correlation coefficient = −0.371, $p$ = 0.0474). **(B)** Mean composite leadership score and rate of satisfaction at the division/department level (correlation coefficient = 0.199, $p$ = 0.300).

systems, including workload, scheduling, compensation, and insurance coverage.[40,41] Further, our study occurred during the COVID-19 pandemic, whereas Shanafelt's took place pre-pandemic. The amount of variance accounted for by leadership in burnout and satisfaction remained consistent, suggesting that leadership may contribute similarly to well-being despite other external factors.


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While Shanafelt et al reported a significant link between composite leadership score and burnout and satisfaction at the division/department level[12], our findings did not reveal such a relationship. This is possibly due to our smaller sample size, higher dilution of votes per leader and resultant lower statistical power per leader. Further research with larger sample sizes would be instrumental in validating these findings. Additionally, a recent study showed differences in perceived organizational support among different specialties,[41] so future studies might explore the differential impact of leadership across specialties. For instance, it is possible that surgical specialties may benefit from different leadership traits, than specialties with more intensive patient-physician interaction, such as family medicine or psychiatry.

## Practical Implications

The association between physician leadership, burnout, and satisfaction has significant implications for healthcare systems. Interventions aimed at improving physician leadership, such as training programs that emphasize emotional intelligence, team building, and conflict resolution, may be effective in reducing burnout rates. While frontline hospitals in the US have pioneered programs to identify, develop, and equip physician leaders[32,33,37,51,52], such programs are not widespread in Canada. Applying the principles outlined in the Mayo Leadership Index, there is an imperative to establish and expand leadership development programs across Canada.

For senior hiring personnel, our study suggests that it may be important to prioritize the recruitment of physician leaders based not only on clinical expertise but on their leadership capabilities. Leaders who effectively support their staff may foster a more resilient workforce, ultimately enhancing physician well-being and patient care. Finally, for those physicians currently in leadership positions, the Mayo Leadership Index offers a number of actionable items that can be implemented immediately to positively influence their teams. Practical actions such as keeping staff informed about institutional changes, conducting career development discussions, soliciting feedback, and encouraging team members to contribute ideas, offer straightforward yet impactful approaches to fostering a supportive work environment.

## Future Directions in the Area of Study

Longitudinal studies examining physician burnout and satisfaction before and after a leadership training intervention[45], would allow for evaluation of causality, strengthening the relationship between leadership and burnout. This could also involve further examination of whether certain dimensions in the Leadership Index have a greater effect on well-being, thereby providing focus for both leadership training programs and immediate action items for current physician leaders. In our study, satisfaction with the organization was measured using a single item; a method that can have low sensitivity and reliability. While this approach was chosen for consistency with previous studies,[12] a validated scale to assess satisfaction (eg, the Job Descriptive Index (JDI)[53]) would improve reliability and provide more detail on specific factors contributing to satisfaction or dissatisfaction. Similarly, the Professional Fulfillment Index (PFI)[54] includes items assessing exhaustion, interpersonal engagement, and medical errors, and has been used recently to assess the relationship between professional fulfillment and leadership behaviours.[55] The benefits of these more detailed measures would need to be balanced with the potential effect on survey completion rate, given the length of the JDI (78 items), PFI (16 items), and other similar scales.[56]

# Limitations

This study has several limitations. First, despite efforts to encourage participation through a two-step recruitment strategy, our response rate of 32.6% was much lower than the 72.2% rate achieved by Shanafelt et al,[12] although we did get representation from all 44 divisions/departments within the hospital. This possibly introduced selection bias, as it is conceivable that those dissatisfied with their leaders or organization are more likely to respond, or alternatively, those who are burned out may be less likely to take the time to respond. Further, data was not collected on non-responders, so we were unable to assess any differences in characteristics between responders and non-responders. Some changes in leadership may have diluted results for those divisions/departments where the leader changed during the study period. We attempted to mitigate this effect by instructing respondents to rate their leader that was in post for at least six months. As a cross-sectional study we cannot determine causality or the directionality of observed relationships. However, this study was a necessary first step, providing preliminary data and justification for a larger scale, longitudinal trial with

a leadership training intervention. Finally, as a single-center study at a large academic health sciences system these results may not be generalizable to other settings. Future studies should include multiple centers across different countries and different practice settings, including community and urgent care clinics, secondary care, and community hospitals. It is notable, however, that our results are consistent with those of Shanafelt et al,[12] which was performed at 3 large academic campuses and a group of community-based hospitals in the United States. Given the limited knowledge available on this topic in Canada, this study adds a valuable starting point for expanding knowledge and training opportunities in this field.

## Conclusion

Overall, 41.7% of physicians in our study reported burnout. Positive leadership qualities of direct supervisors decrease the likelihood of burnout in physicians and increase the likelihood of their satisfaction with the organization. This could inform future organizational directives for leader recruitment and development that in turn will positively affect physicians' well-being.

## Data Sharing Statement

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

## Ethics Approval and Consent to Participate

This study was approved by the Ottawa Health Science Network Research Ethics Board (REB#20200431-01H) and complies with the Declaration of Helsinki. Implied consent was obtained from participants by completing the survey following provision of information regarding the purpose of the study, time involved, risks/benefits, withdrawal, and confidentiality.

## Consent for Publication

All authors accepted the publication of the manuscript.

## Funding

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## Disclosure

The authors report no conflicts of interest in this work.

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