Work team identification associated with less stress and burnout among front-line emergency department staff amid the COVID-19 pandemic

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ABSTRACT
Background The COVID-19 pandemic has exposed front-line healthcare workers to unprecedented risks and stressors threatening both physical and mental health. Prior work in the military has found that team identification, or the sense that one was a part of a team, can help reduce stress and prevent burnout during prolonged stress.

Methods We conducted repeated cross-sectional surveys embedded within emergency department workflow to understand whether team identification was associated with reduced reports of stress and burnout among front-line workers.

Results During the 10-week study which spanned the first wave of COVID-19, 327 of 431 (76%) front-line healthcare workers responded to at least one round of the survey. Higher team identification was associated with significantly less work stress (β = −0.60, 95% CI −0.84 to −0.40, p < 0.001) and burnout (β = −12.87, 95% CI −17.73 to −8.02, p < 0.001) in cross-sectional analyses. Further evidence of the protective effect of team identification for work stress (β = −0.36, 95% CI −0.76 to 0.05, p = 0.09) and burnout (β = −13.25, 95% CI −17.77 to −8.73, p < 0.001) was also found in prospective longitudinal evidence.

Conclusion This work suggests work team identification is a key buffering factor against feelings of stress and burnout. Efforts to promote team identification may offer a promising way for leaders to support front-line healthcare workers’ well-being during the COVID-19 pandemic. These results can inform ongoing COVID-19 operational and quality improvement initiatives.

INTRODUCTION
From uncertainty regarding personal protective equipment to rapidly changing care models, the COVID-19 pandemic has created a working environment characterised by volatility, uncertainty and ambiguity. These conditions, coupled with higher workload, resource scarcity and healthcare worker infection, have the potential to disrupt pre-existing team dynamics and negatively impact healthcare workers’ well-being.2

Even prior to the era of COVID-19, burnout and stress were endemic among healthcare workers and disproportionally affected front-line staff.3 Early reports from countries struggling with the aftereffects of COVID-19 have suggested healthcare workers have increased risk of symptoms of depression, anxiety, insomnia and distress.4 In a recently published study of healthcare workers in New York City, 48% screened positive for depressive symptoms, 57% for acute stress and 33% for anxiety.5 Studies examining factors that may help ameliorate stress and burnout during COVID-19 have largely focused on individual-level behaviours, such as exercise, religion, talk therapy, and yoga, and their effectiveness has not yet been established.6

It is unknown if work team identification—or feeling part of a team at work—can buffer against stress and burnout during COVID-19. Earlier work has found that social support and effective team identification can reduce stress and burnout during non-crisis times,6 and studies of military service members suggest unit cohesion can also improve resiliency during the prolonged stress of war.7 Prolonged stressors, uncertainty and resource scarcity, however, can impede team performance and lead to higher rates of team conflict.8,9 We aimed to examine whether work team identification was associated with buffering front-line healthcare workers from stress and burnout during COVID-19.

METHODS
Data Data come from a repeated cross-sectional study across three emergency departments (EDs) in one of the nation’s largest multisite health systems, which began on 9 April 2020, just before the system experienced a surge in COVID-19 cases, and ended on 15 June. Of the three EDs, one is academic, one is community and one is free-standing, with a combined annual volume of 190,000 patients. Healthcare workers rotate between sites. Surveys consisted of questions from previously published validated scales gauging burnout,10,11 stress10 and work team identification11 (see online supplemental appendix for survey items). Because of the time pressure facing ED healthcare workers, we tailored survey length and language to avoid any interruption in workflow. Specifically, survey questions were rotated in and out across weeks of the survey to obtain the breadth of data desired and to minimise survey length and repetitive survey fatigue. For instance, questions related to burnout were only asked in later survey weeks since burnout is the result of longer-term stress. ED healthcare workers were contacted via text message 15 minutes prior to end of shift and were asked to complete a

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survey on their mobile device. Each healthcare worker received a text message every six shifts with an opt-out option. Note that different staff have varying clinical commitments, and six shifts represent varying time intervals per staff. Additional recruitment of physicians, advanced practice providers, nurses, technicians, unit clerks and environmental service team members was achieved through awareness campaigns involving signs posted in the ED with QR codes, as well as survey links in the daily operational emails. All survey items and communications were done in English.

Data analysis
To examine the associations between work team identification and our key dependent variables—stress and burnout—we estimated two sets of regression models with two-way robust SEs clustered by day and respondent, which takes into account that observations within a given day are likely to be correlated as are responses by the same individual. The first set of models relied on cross-sectional data. The second set of models used measures of team identification at time 1, to predict future burnout and work stress at time 2. All models controlled for suspected COVID-19 caseload and ED volume, supported these initial findings (table 1). Team identification was associated with reporting significantly less work stress ($B=-0.60, 95\% CI -0.84$ to $0.40, p<0.001$) and burnout ($B=-12.87, 95\% CI -17.73$ to $-8.02, p<0.001$) but not home stress in cross-sectional analyses. Moreover, in prospective longitudinal analyses, team identification at time 1 was associated with lower levels of future work stress ($B=-0.36, 95\% CI -0.76$ to $0.05, p=0.09$) and burnout ($B=-13.25, 95\% CI -17.77$ to $-8.73, p<0.001$). In supplementary analyses, we examined the association between team identification and different dimensions of burnout and found that the association was strongest for work-related burnout ($B=-17.1, 95\% CI -23.6$ to $-8.61, p<0.001$), though the differences in coefficients across models were not statistically significant.

Potential COVID-19 caseloads did not have a linear association with stress and burnout. However, stress levels were highest in the week with the highest number of possible COVID-19 cases. Preliminary evidence suggest that members of lower-status occupations (nurses, residents and technicians) may benefit more from team identification (interaction between team identification and low status ($B=-7.86, 95\% CI -14.93$ to $-0.79, p=0.03$). However, these results only held for burnout.

Open-ended comments from healthcare workers reaffirm the importance of feeling one is part of a team during the pandemic. As one team member wrote, ‘I feel very supported at work, COVID-19 or not. We at (hospital site) work as a team and support each other’. As one nurse wrote, ‘Look around, everyone is overwhelmed, exhausted, and stressed. With that said, I have never felt more like a team…everyone has really stepped up and is working together better’.

DISCUSSION
COVID-19 is unlike any challenge faced by most healthcare workers in modern times. While short-term stressors can be highly charged events, the uncertainty of the duration of COVID-19 will continue to put burdens on the front lines. Our study points to steps that leaders can take to improve the well-being of front-line healthcare workers facing the COVID-19 crisis or other protracted occupational stressors.

First, research suggests the importance of framing work at the start of each and every shift to establish mutual understanding and to create alignment. Getting healthcare workers aligned and coordinated regarding the situation at hand is crucial in a crisis. This can be accomplished through huddles or small group clusters, to connect with everyone, and proactively communicate the importance of a
### Table 1: Association between team identification, work stress and burnout

<table>
<thead>
<tr>
<th></th>
<th>Burnout</th>
<th>Work stress</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>95% CI</td>
<td>P value</td>
<td>B</td>
<td>95% CI</td>
</tr>
<tr>
<td>Cross-sectional</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Team identification</td>
<td>-0.51</td>
<td>(-0.84 to -0.18)</td>
<td>&lt;0.001</td>
<td>-0.23</td>
<td>(-0.52 to 0.07)</td>
</tr>
<tr>
<td>COVID-19 cases (1000)</td>
<td>0.01</td>
<td>(-0.04 to 0.01)</td>
<td>0.89</td>
<td>0.34</td>
<td>(-0.14 to 0.82)</td>
</tr>
<tr>
<td>ED volume (1000)</td>
<td>0.37</td>
<td>(-0.004 to 0.16)</td>
<td>0.24</td>
<td>0.34</td>
<td>(-0.21 to 0.89)</td>
</tr>
<tr>
<td>Prospective longitudinal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team identification</td>
<td>-1.02</td>
<td>(-1.20 to -0.83)</td>
<td>&lt;0.001</td>
<td>-0.59</td>
<td>(-0.83 to -0.36)</td>
</tr>
<tr>
<td>COVID-19 cases (1000)</td>
<td>0.99</td>
<td>(-0.02 to 2.01)</td>
<td>0.34</td>
<td>0.43</td>
<td>(-0.74 to 1.61)</td>
</tr>
<tr>
<td>ED volume (1000)</td>
<td>-0.01</td>
<td>(-0.19 to 0.18)</td>
<td>0.99</td>
<td>0.01</td>
<td>(-0.27 to 0.27)</td>
</tr>
</tbody>
</table>

Note: All models control for occupation, ED volume and ED volumes were measured concurrently with the dependent variables.

**ED, emergency department**

During our study, we encountered several important hurdles in promoting the wellness of front-line healthcare workers during COVID-19. First, higher team identification does not appear to buffer against stress at home, suggesting that the benefits of team identification are domain-specific. These findings pose a challenge for healthcare organisations since tools that are effective for reducing COVID-19-related stress at work may not help reduce stress once healthcare workers leave the hospital.

Finally, while improving team identification presents a tangible task to accomplish, creating and sustaining a sense of shared team identity may be difficult in changing teams. While the ED largely consists of a core group of healthcare workers and there is some rotation across sites or from other units, the workforce in this department was largely stable throughout the study period. Specifically, during this study, the workforce was composed of healthcare workers hired for their role in this department as opposed to transferring from another department to help the ED with volume management. In crises such as COVID-19, more staff rotations, floats and reassignments are common, and therefore strong team identification may be more difficult to achieve in some departments and systems.

Team, that it is critical to support each other and that everyone has a valuable role to contribute to the team’s success.15

Second, team stability during extraordinary times can help to cement familiarity, identification, cohesion and the sense of a shared journey with members of the team.16 Where possible, using workload sharing15 or maintaining personnel combinations to build a stronger sense of being part of the team can be beneficial. Working side by side with familiar teammates builds a sense of belonging that may protect provider well-being.

Finally, departments can promote team inclusivity to make all healthcare workers, regardless of role or tenure, feel part of the team. This can be accomplished by proactively seeking out the input of those most at risk of not having a voice, such as newcomers to the unit, temporary members, or those in lower-status roles.16 Such steps boost a sense of belonging for more peripheral members while reinforcing the boundaries and existence of the team for all members. Our work provides preliminary evidence that occupations that are of lower occupational status or that are uniquely vulnerable may benefit most from work team identification. Interestingly, the effect of team identification on work stress appears to diminish over time. This might suggest, as a stressor such as COVID-19 continues, individuals become more comfortable through increased data dissemination, comfort with hospital protocols or the normalisation of experience. The strength of this association does not appear to diminish for burnout, however. Given that burnout is a condition that arises from cumulative or long-term stressors, we would anticipate that this relationship would be more stable. Therefore, the benefit of developing good team dynamics is paramount early in high-stress situations both in helping diminish reduce work stress and helping prevent longer-term burnout. The negative association between total ED volume and longitudinal burnout is another finding that appears counterintuitive, given the high prevalence of burnout in emergency medicine.17–19 It is possible that this association arises from the substantially lower patient volume that the ED experienced during stay-at-home orders. This has been documented in other EDs, as well.20 As patient volume began to increase, this in many ways represented a return to normalcy and may have helped ease the chronic stress arising from COVID-19. Prior work examining mental health responses to disasters has identified a phasic psychological response to sustained stress. Our work likely only covers the earlier phases of this response (early impact, heroic and honeymoon). Further work examining how the association between team identification and work stress may change during later phases is needed.21
Future work examining differences in the relationship between team identification and stress by occupational groups and across different organisational models may lead to a better understanding of potential moderators of this relationship. Moreover, our work suggests that studies examining potential interventions to improve team identification during periods of crises could potentially be fruitful.

CONCLUSION
This work speaks of the importance of sustained attention to the complex interaction between clinical and operational management of COVID-19 and healthcare worker stress and burnout. Consequently, optimising both patient and provider outcomes requires sustained surveillance, leadership and iterative workplace improvements that support workforce attention, morale and stamina through the coming months.

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REFERENCES
Supplementary Appendix

Not all items in the survey protocol were used in this study. Given the time constraints faced by healthcare workers in the Emergency Department, survey items were rotated in and out across the study period in order to maximize the breadth of items covered. Items used in this paper are marked with an asterisk. For longer scales, only items that were the most theoretically pertinent were included after internal consistency was established with Cronbach’s alpha.

Stress

* In the past 24 hours, how would you rate the amount of stress in your life at home?

- 1 - No Stress
- 2
- 3
- 4
- 5
- 6 - Extreme Stress

* In the past 24 hours, how would you rate the amount of stress in your life at work?

- 1 - No Stress
- 2
- 3
- 4
- 5
- 6 - Extreme Stress
How would you rate your ability to handle stress?

- 1 - I can shake off stress
- 2
- 3
- 4
- 5
- 6 - Stress eats away at me

Burnout\(^2\) - Cronbach’s alpha 0.87 in this study

* How often are you physically exhausted?
  - Always
  - Often
  - Sometimes
  - Seldom
  - Never/Almost Never

* How often are you emotionally exhausted?
  - Always
  - Often
  - Sometimes
  - Seldom
  - Never/Almost Never
* Do you feel burnt out because of your work?
  - To a very high degree
  - To a high degree
  - Somewhat
  - To a low degree
  - To a very low degree

* Does your work frustrate you?
  - To a very high degree
  - To a high degree
  - Somewhat
  - To a low degree
  - To a very low degree

* Do you sometimes wonder how long you will be able to continue working with patients?
  - Always
  - Often
  - Sometimes
  - Seldom
  - Never/Almost Never

* How often do you feel weak and susceptible to illness?
  - Always
  - Often
  - Sometimes
  - Seldom
  - Never/Almost Never
How useful are the communications you're receiving about the COVID-19 responses from YNHH?

- 1 Not useful at all
- 2
- 3
- 4
- 5 Extremely useful

Teamwork

- I feel part of a team where I work.
  - Strongly Disagree
  - Slightly Disagree
  - Slightly Agree
  - Strongly Agree

There is good teamwork and communication within my team.

- Strongly Disagree
- Slightly Disagree
- Slightly Agree
- Strongly Agree
- N/A I do not work in a team

There is good teamwork and communication within the ED.

- Strongly Disagree
- Slightly Disagree
- Slightly Agree
- Strongly Agree
Information and knowledge is shared openly in the ED.

- Strongly Disagree
- Slightly Disagree
- Slightly Agree
- Strongly Agree

Employees are respectful and courteous towards one another.

- Strongly Disagree
- Slightly Disagree
- Slightly Agree
- Strongly Agree

Provider Safety^4

I am provided with adequate personal protective equipment (PPE) to provide safe patient care.

1 Strongly disagree
2
3
4
5
6
7 Strongly agree
Meaning of work

My work makes the world a better place.

- 1 - Strongly disagree
- 2
- 3
- 4
- 5
- 6
- 7 - Strongly agree

I would choose my current work life again if I had the chance.

- 1 - Strongly disagree
- 2
- 3
- 4
- 5
- 6
- 7 - Strongly agree
Tolerance of Ambiguity.6

There is really no such thing as a problem that can't be solved

- 1 Strongly disagree
- 2
- 3
- 4
- 5
- 6
- 7 Strongly agree

What we are used to is always preferable to what is unfamiliar

- 1 Strongly disagree
- 2
- 3
- 4
- 5
- 6
- 7 Strongly agree

Many of our most important decisions are based on insufficient information

- 1 Strongly disagree
- 2
- 3
- 4
- 5
- 6
- 7 Strongly agree
Leadership is an ongoing 'presence' in this team—they are readily available

- 1 Strongly disagree
- 2
- 3
- 4
- 5 Strongly agree

Leadership is accessible for discussing emerging problems:

- 1 Strongly disagree
- 2
- 3
- 4
- 5 Strongly agree
Psychological Safety

In this team, if you make a mistake, it is often held against you.

- 1 - Strongly disagree
- 2
- 3
- 4
- 5
- 6
- 7 - Strongly agree

Members of this team are able to bring up problems and tough issues.

- 1 - Strongly disagree
- 2
- 3
- 4
- 5
- 6
- 7 - Strongly agree

It is difficult to ask other members of this team for help.

- 1 - Strongly disagree
- 2
- 3
- 4
- 5
- 6
- 7 - Strongly agree
Open Response

What are the primary emotions you felt today:

If you have any messages you'd like to share with YNHH or the COVID response team about how you are feeling, how you can be better supported, or events that happened today please use the free-response box below.

Organizational Assessment

How supported do you feel by YNHH right now to do your job effectively?

- 1 Not supported at all
- 2
- 3
- 4
- 5 Extremely supported

How confident are you about your last shift team's capacity to provide effective care to patients?

- 1 Not confident at all
- 2
- 3
- 4
- 5 Extremely confident
References