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Featured Article

A Multicenter Survey of Pediatric-Neonatal Transport Teams in the United States to Assess the Impact of the Coronavirus Disease 2019 Pandemic on Staffing

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A B S T R A C T

Objective: The coronavirus disease 2019 pandemic has resulted in unprecedented burnout in frontline health care providers. However, the impact of the pandemic on interfacility pediatric and neonatal transport team members has not been studied. The current study uses a survey design to document the impact of the pandemic on pediatric and neonatal transport team members with a focus on staffing and resilience promotion strategies.

Methods: Data for this study came from a short cross-sectional survey distributed to members of the American Academy of Pediatrics Section on Transport Medicine.

Results: Sixty-six teams responded (around 45%). Forty-one respondents (62%) reported vacancies on their transport teams, with 35 (53.8%) reporting more vacancies during the pandemic. Forty percent of highly trained registered nurses and respiratory therapists from specialty teams left their positions for those with better compensation during the pandemic. Forty-two percent of respondents were not trained to recognize burnout, stress, or compassion fatigue.

Conclusion: Our study shows that half of the respondents had more vacancies during the pandemic than in previous years and reported difficulty in filling those positions. We were unable to link the vacancies to the pandemic and burnout because hospitalizations and transports in the pediatric facilities decreased during the pandemic; however, we do report that coronavirus disease 2019 exposure before the vaccine was a source of stress for team members. There are opportunities to improve the identification of burnout and to foster resilience and boost retention of this highly skilled niche workforce.

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The coronavirus disease 2019 (COVID-19) pandemic has resulted in an unprecedented emotional and physical toll on health care workers.¹ Limited resources, longer shifts, disruptions to sleep, work-life balance, and occupational hazards associated with exposure to severe acute respiratory syndrome coronavirus 2 have contributed to physical and mental fatigue, stress, anxiety, and burnout.² Provider burnout is associated with increased rates of medical errors, decreased productivity, and unfilled positions, straining already over-stretched medical systems and compromising patient safety.^{3,4}

Studies have shown the prevalence of burnout among frontline health care providers, including emergency medicine, primary care, and critical care providers, to be more than 40%.⁵ Transport medicine faces unique challenges in the care of persons infected or potentially infected persons under investigation for COVID-19. However, the impact of the pandemic on interfacility transport team members has not been reported.

Pediatric-neonatal transport team members are frontline providers who usually transport patients in enclosed spaces such as the back of an ambulance or within the confines of rotor wing aircraft, increasing their vulnerability to the infection. During the pandemic, they have been tasked with transporting patients who are either confirmed COVID-19 positive or persons under investigation, requiring them to be in appropriate personal protective equipment. There is

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evidence that the pandemic, before the vaccine, brought personal anxiety and fear for occupational exposure to the forefront.⁶ These reasons may have been a contributing factor to the staffing shortages that the pediatric-neonatal transport teams experienced during the pandemic. This motivated the authors to create a survey tool that was sent to the medical directors of pediatric-neonatal transport teams in the United States to understand the impact of the pandemic on their team members, specifically staffing. Understanding the current practices for fostering resilience among neonatal and pediatric transport programs is critical to assess potential opportunities for continued improvement in this realm.

Methods

Survey Recruitment

The data for this study came from a survey distributed to members of the American Academy of Pediatrics Section on Transport Medicine (SOTM) via its ListServe (LS). The LS was used because a comprehensive list of all pediatric and/or neonatal critical care transport teams in the United States is not available. An e-mail recruiting participants was posted on the LS and included a link to the survey as well as the closure date of the study. The e-mail requested only 1 response per institution to be completed by the medical director/associate medical director with input if needed from the director of operations. The first e-mail recruiting participants was sent on December 13, 2021, followed by a reminder e-mail 2 weeks later. A final reminder e-mail was sent before study closure on January 3, 2022. The day the survey was disseminated via the LS e-mail, it was also advertised on the Facebook page of the SOTM. No incentive was provided for participation. The survey was anonymous and confidential. We did not collect any personal data, and the platform SurveyMonkey (San Mateo, CA) was used for data collection and collation. The UT Southwestern Human Research Protection Program reviewed the project and determined it to be non-human subjects research not requiring institutional review board approval or oversight.

Survey Design

A 10-question cross-sectional Web-based survey was created using a modified Delphi technique with members of the research group as the surveyed experts. After several similar revisions, the final questionnaire was approved and piloted by all authors. The questionnaire was not tested for reliability or generalizability, but content validity was derived from the method of creation using the modified Delphi technique.

Survey Description

The full survey contained 10 questions (Appendix 1). The survey included center-specific information such as the respondent's role, specialty, and gender.

Statistical Analysis

All variables were categorical and expressed as frequencies and percentages. Comparison among groups was performed using the Pearson chi-square test. The expected outcomes were determined using the mean value for each group, except for the question regarding specialty where the mean excluded the "other" category. Given the small sample size, multivariate analyses were not feasible.

Data Reporting Checklist

We used the checklist Consensus -Based Checklist for Reporting of Survey Studies for reporting of this survey per Equator guidelines.⁷

Results

Participant Characteristics

A total of 66 teams responded to the survey. Patel et al⁸ determined in 2015 that there were 145 pediatric transport teams. A more recent publication in 2021 by Stroud et al⁹ put the number of SOTM teams at 110. We estimate the response rate to be between 45% and 60%.

To prevent more than 1 survey per team, we asked for either the medical director or the associate medical director of the transport team to fill out the survey with input from team members as needed. The transport of pediatric and neonatal patients requires highly trained and specialized teams, which was reflected in the fact that 44 (66.6%) had dedicated staff with no other clinical responsibilities (Table 1).

Staffing/Burnout and Fatigue

Forty-one (62.1%) participants reported vacancies on their team during the pandemic ($P < .05$), with 35 (53.8%) reporting more vacancies during this year compared with previous years ($P = .53$). Thirty-five (53.8%) participants reported that they were unable to fill all the vacancies on their team ($P = .53$).

When delineating the reason for staff turnover, the most significant reasons given were positions with better compensation (17 [40.5%]) and personal reasons (15 [35.7%]). Interestingly, only 1 (2.4%) had team members leave over concern about exposure to COVID ($P < .05$) (Fig. 1). When respondents described the most difficult areas for their team before vaccinations, worry about exposure to self/family and becoming ill was the highest (43 [65.2%]) followed by dealing with stress, anxiety, and fear (38 [57.6%]) (Fig. 2).

Recognition of Burnout and Resilience Promotion

In evaluating if training was available to recognize burnout, stress, and compassion fatigue, 38 (57.6%) did have training, whereas 28 (42.4%) did not ($P = .22$), 56 (84.8%) had debriefing sessions, and 49 (74.2%) had mental health assistance programs available to alleviate stress and burnout (Fig. 3).

Discussion

Using a short survey tool, our study summarizes the impact of the pandemic on staffing in pediatric and neonatal transport team members, which was previously unreported in the literature. There is ample evidence describing the impact of the pandemic on the mental health and stress of health care workers responsible for the care of adult patients with COVID-19, with scanty data about the impact on pediatric providers.¹⁰⁻¹² Patients with COVID-19 presented new challenges, especially regarding safety concerns, for members of medical transport teams and truly tested their flexibility and adaptability, but the impact of the pandemic on transport team providers has not been studied.

Table 1

Participant Demographics of Individuals Answering the Survey (N = 66)

	%	P Value
What is your specialty?		
Emergency medicine	10.6	< .05
Neonatology	30.3	
Pediatric critical care	57.6	
Other	1.5	
What is your gender?		
Male	57.6	.22
Female	42.4	
Do the transport team members (nurses and RTs) have:		
Other clinical responsibilities in the hospital	33.3	< .05
Sole transport team responsibility	66.7	

RT = respiratory therapist.

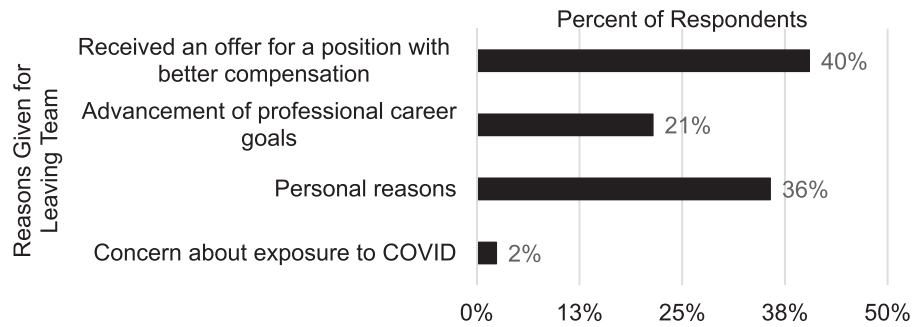


Figure 1. Results from survey question 5: If you had team members leave during the pandemic, did they leave because (n = 42) ($P < .05$).

In our study cohort, most of the survey respondents (62.1%) had vacancies on their transport teams, with 53.8% reporting an inability to fill those vacancies during the pandemic. This finding would be consistent for adult health care systems, but it is an interesting finding to report for pediatric and neonatal transport teams. The World Health Organization estimates a projected shortfall of 18 million health workers by 2030.¹³

However, a recent systemic review indicates that pediatric COVID-19 infection is mild and frequently asymptomatic and carries a low risk of severe illness or death in children.¹⁴ A significant reduction in overall hospitalizations at a children's hospital during the initial severe acute respiratory syndrome coronavirus 2 outbreak compared with the same calendar period in the 4 previous years has been reported.¹⁵ Another multicenter cross-sectional study of encounters at 44 children's hospitals in the United States reported a substantial reduction in the encounters for respiratory diseases during the pandemic.¹⁶ Hence, these vacancies on the pediatric and neonatal transport teams, as identified by the survey, are perplexing. The vacancies may stem from 2 reasons; teams unable to find qualified applicants despite having active job listings and/or team positions intentionally not filled secondary to reduced patient volumes. This survey was not structured to differentiate between these 2 reasons. Although the number of job listings can be reviewed to determine how many active job postings are present, the determination of active recruitment to fill those positions becomes problematic.

In our study, 40% of respondents reported that staff left because they had received an offer for a position with better compensation. Our findings resonate with a study performed before the pandemic that reported that most employees left transport teams for either

better compensation or better schedules.¹⁷ However, it is important to reflect on the sharp dichotomy in the responses received regarding questions 5 and 8 as evident in Figures 1 and 2. Although the responses elicited for question 5 indicate that the primary reason for staff turnover was better compensation, 65.2% reported in response to question 8 that prevaccination their team members had the most difficulty with worry about exposure to self/family and becoming ill. We believe that the fear of occupational exposure prevaccination was a source of stress and burnout, and when these team members were offered better compensation, it might have resulted in vacancies.

Burnout is a critical issue that generates inefficiency in health care organizations. Several evidence-based strategies exist that prevent and reduce burnout in health care workers. These include stress management; shorter shifts; planned days off (even during crisis); incorporation of efficient clinical work processes; debriefing at the end of a shift; and, most importantly, recognition by the organization that human limitations on a physical, cognitive, and emotional level exist.^{18–22} Peer support, open communication, and team building programs can mitigate the impact of the pandemic on workers.²³ Self-care in the form of exercise, balanced diet, good sleep hygiene, family support, job satisfaction, and mindfulness has been proposed to build and maintain resilience.²⁴ Our survey results show an opportunity for improvement in this realm. Only 58% of respondents reported training to recognize burnout and fatigue. Recognition is the key to early initiation of strategies to mitigate burnout and stress and foster resilience. Our survey results indicate that most organizations have some strategies in place to foster resilience, but we did not delve into how many of these were used by team members.

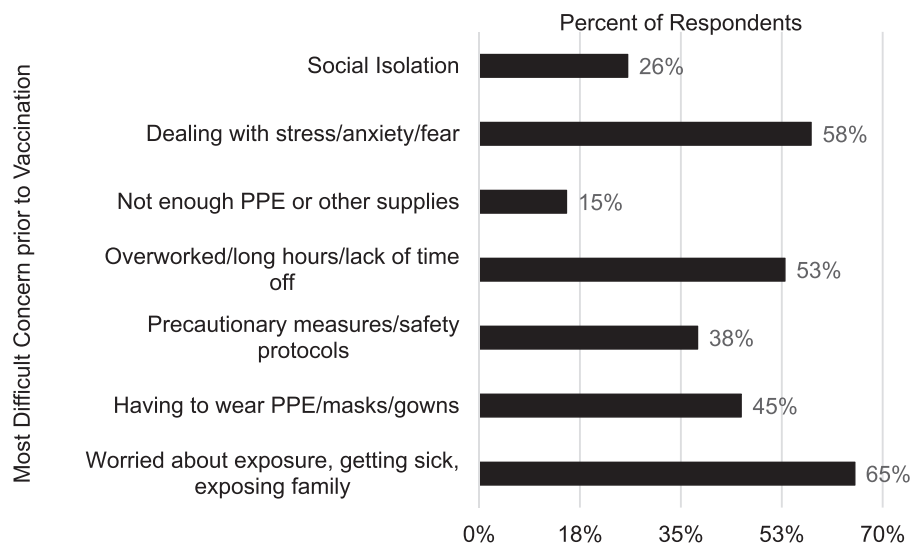


Figure 2. Results from question 8: What has been most difficult for your team during the pandemic, prior to vaccination? (N = 66).

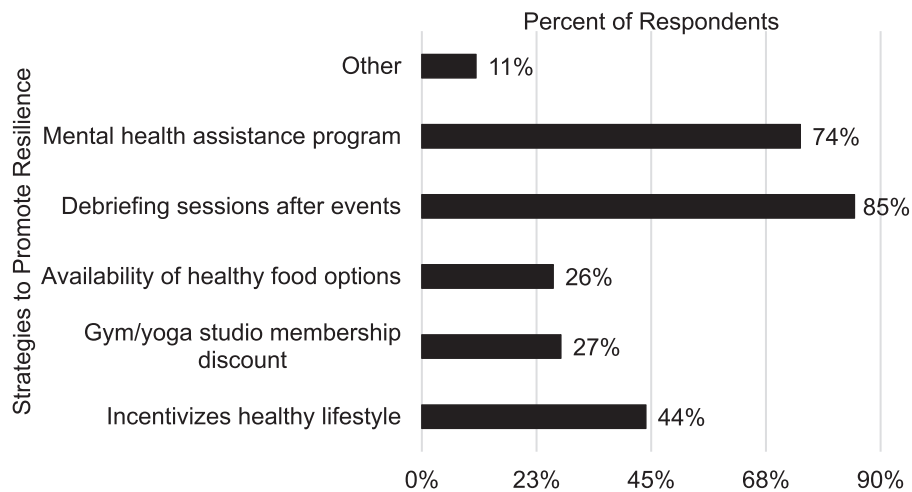


Figure 3. Results from question 10: How does your work culture promote resilience? (N = 66).

Limitations

First, the approach used to capture the data (survey e-mails sent via the LS and social media posts) limit the ability to calculate a precise response rate. Individual centers were not targeted as part of the survey; hence, response rates were lower than might have been achieved with targeted recruitment. Also, because individuals are members of the SOTM, more than 1 respondent from a transport team might have filled out the survey. We did not have the ability to perform an IP check or use cookies to prevent multiple entries from the same individual. To improve participation, the survey was limited in the number of questions posed.

We did not define burnout or use a validated burnout instrument, so there is a possibility of results being biased if respondent interpretation differed from the authors' intent or if the lack of a definition led to underreporting because of failure of recognition among the respondents.

The medical director of transport or the associate medical director of the transport team was invited to answer the survey on behalf of their transport team rather than the team members directly. There is a possibility for recall bias even if they were aware of all reasons for staff resignation. Also, there was attrition from the transport team workforce both before and after the availability of protective vaccines. However, the ability to recall the reasons for those members who left more recently (ie, postvaccination) might have affected the responses reported.

Finally, the survey provided information about the mitigation strategies that workplaces offered to foster resilience. We did not capture the extent of their utilization. As with any cross-sectional study, association does not equal causation. Similarly, availability does not equal utilization. There are data points that were not collected in this study that could be beneficial in understanding reasons for attrition of health care workers from the transport teams as well as honing in on strategies for recognizing and limiting burnout. The survey was limited in the number of questions posed to improve participation.

This study has shared novel data and also highlighted opportunities for further studies in this realm. We are currently working on a tool to survey the transport team members directly to better understand the impact of the pandemic on staffing and vacancies. Our goal is to study the pediatric and neonatal teams separately and conduct an in-depth exploration into identifying strategies that promote resilience and retention.

Conclusions

Despite these limitations, clear themes emerged from this work. First, half of the respondents had more vacancies during the pandemic than in the previous years and reported difficulty in filling those positions. We were unable to link the vacancies to the pandemic and burnout because hospitalizations and transports in the pediatric facilities decreased during the pandemic. However, the study did establish that COVID-19 exposure before the vaccine was a challenge for the team members. Second, 40% of highly trained registered nurses and respiratory therapists from specialty teams left their positions for those with better compensation during the pandemic. We theorize that burnout may have contributed to transport team vacancies, but surveying team members directly is a necessary next step in studying this.

Our study identified that 42% of respondents are not trained to recognize burnout, stress, or compassion fatigue. There are opportunities to improve in identifying burnout and fostering resilience. This survey highlights an educational gap, which can be addressed by training modules and targeted workshops, potentially sponsored and disseminated by the SOTM. With "burnout" now officially recognized by the World Health Organization, the responsibility for managing it has shifted away from the individual and to the organization. Resilience training is key to reducing stress and should be the primary intervention on which hospital systems focus to facilitate the retention of highly trained transport team members.

Appendix 1. Survey Questions and Answer Choices

- 1) What is your specialty?
 - a. Emergency Medicine
 - b. Neonatology
 - c. Pediatric Critical Care
 - d. Other

- 2) What is your gender?
 - a. Male
 - b. Female
 - c. Transgender
 - d. Gender Variant/Nonconforming
 - e. Other
 - f. Prefer not to say

- 3) Do the transport team members (nurses and RTs) have:
 - a. Other clinical responsibilities in the hospital
 - b. Sole transport team responsibility
- 4) Did you have team members leave during the pandemic?
 - a. Yes
 - b. No
- 5) If you had team members leave during the pandemic, did they leave because:
 - a. Concern about exposure to COVID
 - b. Personal reasons
 - c. Advancement of professional career goals
 - d. Received an offer for a position with better compensation
- 6) Were there more vacancies on your team this year as compared to the previous years?
 - a. Yes
 - b. No
- 7) Have you been able to fill up all the vacancies on your team?
 - a. Yes
 - b. No
- 8) What has been most difficult for your team during the pandemic, prior to vaccination? (Multiple answers are allowed)
 - a. Worried about exposure, getting sick, exposing family
 - b. Having to wear PPE/masks/gowns
 - c. Precautionary measures/safety protocols
 - d. Overworked/long hours/lack of time off
 - e. Not enough PPE or other supplies
 - f. Dealing with stress/anxiety/fear
 - g. Social isolation
- 9) Have you and your team leads received training to recognize burnout, stress, and compassion fatigue?
 - a. Yes
 - b. No
- 10) How does your work culture promote resilience? (Multiple answers are allowed)
 - a. Incentivizes healthy lifestyle
 - b. Gym/yoga studio membership discount
 - c. Availability of healthy food options
 - d. Debriefing sessions after events
 - e. Mental health assistance program
 - f. Other

COVID = coronavirus disease; PPE = personal protective equipment; RT = respiratory therapist.

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