Burnout, Professional Fulfillment, and Post-Traumatic Stress Among Pediatric Solid Organ Transplant Teams

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Running Head: Burnout in Pediatric Transplant

Abbreviations: PFI = Professional Fulfillment Index; IES-R = Impact of Events Scale, Revised; PTSD = Post-traumatic stress disorder.

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Pediatr Transplant

Abstract

Background: Adverse effects of clinician burnout has been studied across multiple specialties, however, there have been no studies examining rates of burnout among pediatric solid organ transplant teams. This study aimed to measure burnout, work exhaustion, professional fulfillment, and post-traumatic stress symptoms among clinicians and administrators practicing in this high stress field. **Methods**: This cross-sectional study utilized a 50 item web-based survey that included the Personal Fulfillment Index and the Impact of Events Scale (Revised). This survey was distributed across four pediatric solid organ transplant centers in North America. Basic demographics, clinician characteristics, and information regarding wellness and self-care activities were collected. Descriptive and correlational analyses were performed. **Results:** 135

participants completed the survey; 76% were female and 78% were Caucasian. One-third (34%) of participants endorsed burnout, while 43% reported professional fulfillment. Approximately 15% of respondents endorsed clinically significant levels of post-traumatic stress symptoms related to patient deaths, with female clinicians more likely to endorse symptoms (p=.01). Nearly 80% of participants reported engaging in self-care activities outside of work and only 10% of participants reported participation in hospital-sponsored wellness programs. **Conclusions:** Pediatric solid-organ transplant team members exhibited moderate levels of burnout, professional fulfillment, and post-traumatic stress. Female clinicians were the most likely to experience both work exhaustion and post-traumatic stress symptoms. Transplant centers are encouraged to consider interventions and programming to improve clinician wellness.
Keywords: Burnout; post-traumatic stress; wellness; pediatrics; transplant.

Introduction

The ever-increasing demands on healthcare workers has spurred a great deal of research and interventions targeting "burnout." The term burnout, originally described as exhaustion from "excessive demands on energy, strength or resources" in the workplace is characterized by symptoms of malaise, fatigue, frustration, cynicism, or inefficiency.[1] Moral distress, compassion fatigue and secondary traumatic stress have also been used to define the adverse sequelae clinicians may experience as a result of patient care in high stress environments. Healthcare clinician burnout is common, with half of academic medical center physicians endorsing burnout, and increasing rates of burnout being observed over the past decade.[2] Similarly high rates of burnout, moral distress, and poor work-life balance have been observed in non-physician disciplines as well, including advanced practice providers, pharmacists, nurses and social workers.[3] Burnout is associated with increased risk for cardiovascular disease, alcohol abuse, depression, suicide and shortened life expectancy in healthcare clinicians.[4-6] Some leave the field altogether.[5-7] Burnout has also been associated with increased medical errors and patient mortality.[6,8-10] These adverse effects of burnout on both clinicians and patients have been seen across healthcare disciplines.[11,12]

Some identified risk factors for burnout include "frontline" clinical care work, early career status, excessive administrative tasks, electronic health record demands, and increased time at work.[3,4,12-14] Both compassion fatigue and secondary traumatic stress pertain to the strains

of bearing witness to others' suffering. Moral distress, which Jameton[15] defined as when one "knows the right thing to do, but institutional constraints make it nearly impossible to pursue the right course of action," is also a contributing factor to burnout among clinicians.[3] These risk factors are common to work performed in pediatric solid organ transplantation. Caring for critically ill children and their parents can contribute to high stress and long hours. Moreover, solid organ transplantation lacks predictability. Changes in schedule and workload demands are common. The decisional burdens of transplant listing given the limited availability of donor organs is also a potential contributor to moral distress.

To our knowledge, there have been no investigations of burnout and related constructs among pediatric solid organ transplant team members. The current study aimed to measure burnout, work exhaustion, interpersonal disengagement, professional fulfillment, and post-traumatic stress symptoms among multidisciplinary pediatric solid organ transplant team members. It was hypothesized that while both work exhaustion and post-traumatic stress symptoms would be significant across the sample, participants would endorse high professional fulfillment related to their work. A secondary aim included the testing of associations between burnout constructs and clinician characteristics.

Participants and Methods

Participants and Methods

A 50-item, web-based survey was distributed from March – April 2019 across four geographically dispersed pediatric solid-organ transplant centers in North America. A link to the web-based survey was sent by email to all members of the multidisciplinary pediatric solid organ transplant teams at each of the four centers by a transplant center leader/administrator. Participation in the survey was optional. No incentives were provided for survey participation, which took approximately 5 minutes. No personal or center-specific identifying information was collected from survey participants due to the sensitivity of the questions. A one-time reminder email was sent again to eligible providers during the open survey period. Participant responses were excluded if more than 30% of the survey was incomplete.

Measures

Background Information. The following clinician characteristics were collected: provider type/role, organ group served, sex, age, race, years in practice, time spent in clinical,

administrative and research work, and number of patient deaths experienced in past year. Respondents were also asked to select wellness/self-care activities they engage in.

Professional Fulfillment Index (PFI). The PFI is a validated, 16-item instrument of three constructs: professional fulfillment (6 items), work exhaustion (4 items), and interpersonal disengagement (6 items). A burnout composite scale is calculated by averaging all work exhaustion and interpersonal disengagement items (10 items total). Items are scored using a 5-point Likert-scale ranging from 0 (not at all) to 4 (completely true/extremely). A cut-off score of 3 or greater (scale range 0-4) has been suggested to indicate very good professional fulfillment. A cut-off score of 1.33 or greater is used to indicate burnout. In the initial survey design and testing study of the PFI, 39% of the 250 physician (residents and faculty at a large academic medical center; all specialties) scored at or above the PFI burnout cut-off of 1.33. The proportion of participants scoring above the PFI burnout cut-off was also compared to the proportion of those with burnout as measured by three additional burnout measures completed by the same study participants, which ranged from 32-49%, respectively. Thus, sensitivity of the PFI burnout scale in comparison to these three additional published measures was determined to be >0.72, with specificity of >0.76.[8]

Impact of Events Scale, Revised (IES-R). The IES-R is a 22- item, self-reported, validated questionnaire that has been widely used to measure symptoms of post-traumatic stress disorder (PTSD) related to a particular trauma.[16,17] Post-traumatic stress symptoms fall under three categories: re-experiencing, avoidance, and hyperarousal. Permission was obtained from the scale's author to modify instructions to specifically ask participants to respond to items as they related to a patient death(s) (i.e., identified event or trauma). Items are scored using a 5-point Likert-scale ranging from 0 (not at all) to 4 (extremely). A higher score represents greater distress.[18] In the current study, a cut-off score of 24 (range 0-88) was used to define those with clinically significant symptoms of post-traumatic stress.[19]

Statistical Analysis

Univariate analyses were used to describe the sample. Bivariate procedures (Pearson correlation, two sample t-tests) were used to test for associations between provider characteristics and PFI subscales. IES-R total score was not normally distributed, therefore, non-parametric procedures (Spearman correlation, Wilcoxon two sample test) were used to test for associations with provider characteristics. For some provider characteristics, categories were

combined and/or pre-specified groups were compared. Specially, for provider type, we compared attending surgeons and physicians (group 1) to transplant coordinators, NP, PAs and RNs (group 2). For provider race/ethnicity, we compared White Non-Hispanic (group 1) to all other race/ethnicity combinations (group 2). For each organ specialty, we compared providers who endorsed serving that organ group to those who did not. All tests were two-tailed with an alpha of 0.05 and were completed with SAS 9.4 (SAS Institute; Cary, NC).

Results

Sample Characteristics

A total of 135 respondents completed the survey. It was estimated that the survey was sent to approximately 280 potential participants (two centers were unable to provide total sample size due to email distribution method). Thus, the estimated response rate was approximately 48%. Participant characteristics can be found in Table 1. Participants were predominately female (76%) and Caucasian (78%). Nearly half were less than 40 years of age. A range of professionals across disciplines participated in the study with transplant coordinators/advanced practice professionals/registered nurses (26%) and attending physicians (22%) being most common. Additional information about job responsibilities within discipline was not collected, but is likely highly variable.

Clinician Wellness Practices

Participants reported on their current self-care and wellness activities. Only 10% reported participating in hospital wellness programs or activities with 13% engaging in trainings or workshops to improve their work-related efficiency. Nineteen percent of respondents attend hospital-initiated bereavement or debriefing programs. The majority of respondents reported engaging in out of work self-care activities (80%), such as exercise or time outside. A third (33%) gather and socialize with colleagues outside of work and 8% participate in psychotherapy. Less than half of respondents (47%) indicated that they utilize their vacation time fully.

Professional Fulfillment

See Table 2 for overall sample and characteristic specific professional fulfillment, work exhaustion, interpersonal engagement and traumatic stress scores. Total sample professional fulfillment was slightly below the recommended cut-off of 3 with a median score of 2.8 (IQR 2.3 – 3.0, range 1.0-4.0); 43% of respondents endorsed professional fulfillment above the cut-off. Clinician sex, race/ethnicity, age, years in practice, type/role and organ subspecialty were

unrelated to professional fulfillment. Time spent in clinical, administrative and research based work was unrelated to professional fulfillment.

Clinician Burnout, Work Exhaustion and Interpersonal Engagement

A composite burnout score of 1.1 was calculated across the sample, which is slightly below the recommended cut-off score of 1.33. One-third (34%) of participants endorsed burnout symptoms above the cut-off. Work exhaustion was moderate among the sample with a median score of 1.5 (IQR 1.0-2.0, range 0.0-3.5). Female clinicians endorsed greater work exhaustion than males ($p<0.05$) and transplant coordinators/advanced practice professionals/registered nurses reported greater work exhaustion than attending physicians ($p\leq.05$). There were no other significant correlations detected between work exhaustion and clinician race/ethnicity, age, years in practice, and organ subspecialty. The median interpersonal disengagement subscale score was 0.7, (IQR 0.2 – 1.2, range 0.0-2.2). Greater time spent in administrative work was associated with higher interpersonal disengagement ($p<.05$).

Clinician Post-Traumatic Stress Symptoms

The mean score for Impact of Events Scale – Revised was 10.7 (SD =12.1). Although the majority of respondents (85%) had no PTSD risk per the cut-off score of 24, 15% of respondents endorsed clinically significant levels of post-traumatic stress symptoms related to a patient death(s). Female clinicians were significantly more likely to endorse post-traumatic stress symptoms compared to male clinicians ($p=.01$). Across organ groups, renal transplant clinicians scored significantly lower ($p=.004$) compared to those who did not work in renal transplant. Iintestinal ($p=.007$) and multiviseral ($p=.02$) transplant clinicians endorsed higher levels of post-traumatic stress symptoms compared to those who did not work with these transplant populations.

Discussion

This is the first study of burnout, professional fulfillment, and post-traumatic stress among multidisciplinary pediatric solid organ transplant clinicians. Findings are suggestive of moderate levels of professional fulfillment, as well as burnout, particularly work exhaustion. The deaths of pediatric transplant patients significantly impact transplant clinicians, with 15% of the study sample endorsing clinically high levels of post-traumatic stress symptoms. Results further underscored that while few clinician characteristics are associated with increased risk for burnout

or post-traumatic stress symptoms, female clinicians were more likely to experience both work exhaustion and post-traumatic stress symptoms.

In comparison to the adult transplant literature, which reports symptoms of burnout in half of coordinators[12] and half of transplant surgeons,[20] our study results revealed slightly lower rates of burnout, with a third of the sample endorsing symptoms above the cut-off. This difference may in part be due to the multidisciplinary nature of our sample. Additionally, these earlier transplant clinician burnout studies used different measures of burnout, limiting direct comparison. Nonetheless, study results underscore the importance of reducing burnout,, particularly given associations with worse professional quality of life[21] and increased medical errors in transplant clinicians[22]

Post-traumatic stress is not unique to solid organ transplant clinicians, and has been identified in other pediatric clinicians.[23,24] Our study found that 15% of clinicians reported post-traumatic stress symptoms. This is in the range of rates reported in studies of other pediatric subspecialties (i.e., 2% in general pediatricians[24] to 20% in pediatric intensive care clinicians).[23] Early career intensive care faculty and nurses have been found to be more likely to report burnout and post-traumatic stress symptoms than more senior clinicians.[25] Post-traumatic stress symptoms are also reported in pediatric intensive care trainees,[26] many of whom report severe grief in response to patient deaths.[27] Clinician age and years of practice were not found to be associated with burnout or post-traumatic stress symptoms in our sample; however, very few trainees participated in the current study. Clinicians from certain organ groups scored significantly higher on measures of post-traumatic stress than those from other organ groups, while rates of burnout were similar across all organ groups. It is likely that this finding is due to the increased frequency of patient deaths in some transplant specialties. Study findings highlights the importance of considering trauma and grief responses when working to address clinician wellness.

It was also notable that female clinicians in the current study were more likely to report greater work exhaustion and post-traumatic stress symptoms than male transplant colleagues. It is possible that this finding is secondary to the demands placed on female clinicians outside of the workplace. A study of surgeons found that female surgeons were much more likely to be partnered with a spouse who worked full-time – with the female partner being primarily responsible for managing the household.[28] This is similar to a survey of National Institute of

Health career-development awardees, which found female awardees with children devoted much more time to domestic activities than male awardees with children.[29] These gender differences in household responsibilities have been documented in the pediatric specialty as well.[30] Several studies suggest that these gender differences in work-life responsibilities are correlated with the differences in burnout between male and female physicians.[32] Our findings, together with the broader literature, underscore a need for academic institutions to better support their female clinicians.

It is important to note that data was collected pre-COVID-19 pandemic. The first wave of the COVID-19 pandemic significantly impacted transplant programs whose clinicians had to make a myriad of challenging decisions, such as deferring transplantation amidst the risk of waitlist mortality.[34] A national survey performed in March 2020 revealed that 71.8% of live donor kidney and 67.7% of live donor liver transplant programs underwent complete suspension for a period of time.[35] For those transplant centers that remained operational, ensuring the safety of the procurement teams also required serious considerations.[36]

During the pandemic, healthcare professionals are experiencing higher rates of burnout than previously reported.[37] Many team members faced redeployment in a resource scarce environment,[38] which only increased job-related stress. Non-work-related demands, such as child and elder care, schooling challenges, and financial strain have also increased. In addition to burnout, mental health disorders including anxiety and depression are also commonly endorsed among clinicians during the pandemic.[39,40] More so than ever before, attention to supporting the needs and wellbeing of healthcare clinicians must be a priority.

However, there continues to be a paucity of literature regarding interventions that have led to long-term reduction in rates of physician burnout.[41] Effective interventions to combat burnout is complicated as it involves addressing individual, work-unit, organizational, and national factors.[42] Moreover, the effect of combining interventions has not been well studied.[41] In the current study, only 10% of respondents reported participation in hospital-based wellness initiatives, which is discrepant when compared to a national survey of pediatric subspecialists noting 60% participation.[43] The low participation rate in hospital wellness programming among our study respondents may be secondary to time constraints and heavy workloads in the field of organ transplantation which may make participation in self-care initiatives challenging. Also, while many hospitals offer mental health services, participation rates are noted to be quite low.[43]

Other programmatic interventions to consider include peer-debriefing sessions and workshops to promote emotional processing during distressing patient care scenarios.[44,45] Additional interventions that may reduce burnout include improving communication and workflow within the team and initiating quality improvement projects that are targeted at addressing clinician concerns.[46] As more than half of the respondents in this study did not utilize their allotted vacation time, organizational-level interventions which allow for adequate staffing to provide sufficient coverage for leave may also mitigate burnout.[47] Novel supports to reduce non-work related stressors, such as on-site home services (e.g., dry cleaning, meal delivery) may also prove beneficial. Effective interventions differ among disciplines. Thus, attention should be paid to unique job responsibilities when designing and implementing interventions. Lastly, helping clinicians to foster professional fulfillment by doing work that is meaningful to them, receiving appreciation for their efforts, and working together with a cohesive, supportive team is an important intervention target.

Results of this study must be considered in light of its limitations. First, the definitive total sample size is unknown due to the email/list-serv distribution approach employed at some centers. Thus, the response rate is only an estimate. Relatedly, those interested in the topic may have been more likely to complete the survey, limiting the generalizability of findings to all pediatric solid organ transplant team members. The majority of respondents were Caucasian, thus, additional stressors experienced by healthcare clinicians of minority group status may not be well captured by this dataset. Further, although a strength of this research is the inclusion of team members across disciplines, small numbers of participants in certain disciplines limited comparisons across roles. Moreover, job responsibilities within disciplines likely vary across transplant teams. Granular data specific to job responsibilities was not captured in this study, but is likely impactful with regard to burnout. Lastly, the burnout measure used was initially validated in a physician only sample. While it has since been used in published studies to measure burnout across healthcare disciplines, formal validation and psychometric data in other populations has not yet been published to our knowledge.

In sum, this first study of burnout, professional fulfillment, and post-traumatic stress among multidisciplinary pediatric transplant team members highlights that while many of us find fulfillment and meaning in our work, the work of pediatric transplant care can be both exhausting and traumatic. The risks of burnout occur widely across the field of pediatric transplantation.

Clinically significant levels of post-traumatic stress are also high, further underscoring the need to prioritize interventions and systemic supports to improve team member wellbeing.

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Table 1. Participant Characteristics

Provider Type/Role	
Attending Physician	30 (22%)
Attending Surgeon	7 (5%)
Resident/Fellow	3 (2%)
Transplant Coordinator, NP, PA, RN	35 (26%)
Psychologist	4 (3%)
Social Worker	12 (9%)
Transplant Administrator	7 (5%)
Other*	37 (28%)
Provider Age, Years	
< 40 years	66 (49%)
41-50 years	40 (30%)
51-65 years	25 (19%)
> 65 years	3 (2%)
Provider Sex	
Male	31 (23%)
Female	103 (76%)
Not Listed/Prefer Not to Answer	1 (1%)
Provider Race/Ethnicity	
White/Caucasian	104 (78%)
Black/African American	1 (1%)

Asian	17 (13%)
Hispanic/Latino	2 (1%)
Middle Eastern	5 (4%)
Bi- or Multi-Racial	4 (3%)
Provider Years of Practice	
< 5 years	30 (22%)
5-10 years	35 (26%)
11-20 years	36 (27%)
> 20 years	33 (25%)
Organ Specialty (Multi-Select)	
Cardiac	65 (48%)
Liver	63 (47%)
Lung	35 (26%)
Renal	55 (41%)
Intestinal	43 (32%)
Multivisceral	44 (33%)
Other (Bone Marrow Transplant)	2 (1%)
Externally Funded Research	
Yes	29 (22%)
No	105 (78%)

Table 2. Burnout and Fulfillment Scores by Participant Characteristics

	PFI Professional Fulfillment Subscale Score, mean (SD)	PFI Work Exhaustion Subscale Score, mean (SD)	PFI Disengagement Subscale Score, mean (SD)	Impact of Events Scale Total Score, median (IQR)
All providers combined	2.7 (0.6)	1.5 (0.8)	0.7 (0.6)	6.0 (2.0 – 17.0)
Provider Type/Role		**a < b**		
Attending Physician	2.8 (0.7)	1.4 (0.8)[a]	0.8 (0.6)	5.5 (2.5 – 15.0)
Attending Surgeon	2.9 (1.1)	1.0 (0.8)[a]	0.5 (0.6)	2.0 (0.0 – 11.0)
Resident/Fellow	3.2 (0.6)	0.6 (0.4)	0.7 (0.7)	2.0 (0.0 – 16.0)
Transplant Coordinator, NP, PA, RN	2.8 (0.6)	1.7 (0.7)[b]	0.8 (0.5)	8.0 (3.0 – 19.0)
Psychologist	2.5 (0.6)	1.4 (0.2)	0.6 (0.6)	1.5 (0.0 – 11.5)
Social Worker	2.6 (0.4)	1.9 (0.8)	0.9 (0.7)	6.0 (2.0 – 8.0)
Transplant Administrator	2.7 (0.7)	1.2 (0.9)	0.4 (0.4)	4.5 (1.0 – 15.0)
Other*	2.5 (0.7)	1.6 (0.7)	0.7 (0.6)	8.0 (4.0 – 21.0)
Provider Age, Years				
< 40 years	2.7 (0.6)	1.6 (0.7)	0.8 (0.6)	6.0 (1.5 – 15.5)
41-50 years	2.7 (0.7)	1.5 (0.8)	0.7 (0.6)	6.0 (2.0 – 18.0)
51-65 years	2.7 (0.6)	1.5 (0.8)	0.6 (0.6)	5.0 (1.0 – 11.0)
> 65 years	3.6 (0.6)	0.9 (0.6)	0.7 (0.6)	24.0 (5.0 – 30.0)
Provider Sex		**a < b**		**a < b**
Male	2.9 (0.8)	1.3 (0.8)[a]	0.6 (0.6)	3.0 (0.0 – 11.0)[a]
Female	2.6 (0.6)	1.6 (0.7)[b]	0.8 (0.6)	7.0 (3.0 – 18.0)[b]
Not Listed/Prefer Not to Answer	2.7 (n/a)	2.8 (n/a)	0.8 (n/a)	18.0 (n/a)
Provider Race/Ethnicity				
White/Caucasian	2.7 (0.7)	1.5 (0.7)	0.7 (0.6)	6.5 (1.0 – 18.0)
Black/African American	2.3 (n/a)	0.2 (n/a)	0 (n/a)	n/a
Asian	2.8 (0.6)	1.6 (0.9)	0.8 (0.8)	4.0 (0.5 – 5.5)

Data are presented as N (%) for categorical variables. *Other included child life specialists, nutrition specialists, physical and occupational therapists, pharmacists.

Hispanic/Latino	2.6 (0.4)	1.5 (0.3)	0.7 (0.9)	12.0 (3.0 – 21.0)
Middle Eastern	2.9 (0.4)	1.7 (0.7)	0.8 (0.5)	11.0 (10.0 – 27.0)
Bi- or Multi-Racial	2.9 (0.2)	0.9 (0.8)	0.8 (0.6)	9.0 (1.0 – 28.0)
Provider Years of Practice				
< 5 years	2.6 (0.7)	1.4 (0.7)	0.8 (0.6)	4.0 (1.0 – 12.0)
5-10 years	2.7 (0.4)	1.4 (0.8)	0.7 (0.6)	9.0 (3.0 – 17.0)
11-20 years	2.8 (0.8)	1.6 (0.8)	0.7 (0.7)	8.0 (1.5 – 19.0)
> 20 years	2.7 (0.7)	1.6 (0.6)	0.7 (0.5)	5.0 (1.0 – 13.0)
Organ Specialty (Multi-Select)				**a < b**
Cardiac	2.7 (0.6)	1.5 (0.8)	0.7 (0.6)	6.0 (2.0 – 15.0) [a]
Liver	2.7 (0.6)	1.5 (0.7)	0.7 (0.6)	7.0 (3.0 – 18.0) [a]
Lung	2.8 (0.7)	1.4 (0.8)	0.8 (0.6)	6.0 (3.0 – 21.0) [a]
Renal	2.7 (0.7)	1.5 (0.7)	0.7 (0.6)	4.0 (0.0 – 11.0) [a]
Intestinal	2.8 (0.7)	1.5 (0.7)	0.6 (0.6)	11.0 (3.0 – 30.0) [b]
Multivisceral	2.7 (0.7)	1.6 (0.8)	0.7 (0.6)	11.0 (3.0 – 28.0) [b]
Other (Bone Marrow Transplant)	3.2 (0.1)	1.2 (0.4)	0.5 (0.7)	8.0 (8.0 – 8.0)
Externally Funded Research				
Yes	2.8 (0.6)	1.3 (0.6)	0.6 (0.5)	4.0 (2.0 – 11.0)
No	2.7 (0.6)	1.6 (0.8)	0.7 (0.6)	6.0 (2.0 – 18.0)

*Other included child life specialists, nutrition specialists, physical and occupational therapists, pharmacists.

[ab]Subscripts are used to denote comparison groups for significant group comparisons.

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