Compassion Fatigue in Surgical Trainees

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OBJECTIVE: Compassion fatigue (CF) is the profound sense of emotional exhaustion that care providers can experience as the result of helping others in distress. CF can contribute to burnout (BO), depression, and stress-related illness. While surgeons and surgical trainees may be at high risk for developing CF, it has not been adequately characterized or explored in this population. The objective of this study was to examine the prevalence and impact of CF in surgical trainees with a view to inform a management strategy.

STUDY DESIGN AND SETTING: A mixed method study was conducted using survey and interview methods. An email survey including the Professional Quality of Life Scale Version 5, an instrument to assess CF, was sent to all trainees in the Department of Surgery at the University of Toronto. Survey data were analyzed descriptively and using one-sample *t* tests. Semistructured interviews were conducted with volunteered trainees. Data collection and analysis occurred iteratively and inductively using the constant comparison method.

RESULTS: One hundred fifteen trainees completed the survey representing a 47% response rate. Ninety-nine respondents (40.7%) completed the Professional Quality of Life Scale tool. The mean score on the compassion satisfaction subscale was 36.9 (SD 6.7), on the BO subscale was 26.2 (SD 5.6), and on the secondary traumatic stress (STS) subscale was 21.2 (SD 6.3). The mean on the compassion satisfaction subscale was not statistically different from the population mean ($p = 0.22$). The means for the BO and STS scales were statistically higher in our study sample compared to the normative data ($p < 0.0001$ for each). Thematic qualitative findings indicated trainees experienced CF symptoms. Participants described systemic barriers to mitigating CF including workload and a cultural expectation to be unemotional at work.

CONCLUSION: Surgical trainees report high levels of BO and STS and currently use informal coping strategies outside of their academic and hospital environments. Trainees are likely to welcome and benefit from an organized response to support their emotional health when facing difficult patient encounters. (J Surg Ed 76:1211−1222. © 2019 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: compassion fatigue, stress, surgical training, survey, interviews

COMPETENCIES: Patient Care, Professionalism, Interpersonal and Communication Skills

INTRODUCTION

The privilege and responsibility of caring for sick and dying patients can have a profound emotional impact on health care professionals. Recent increased interest in the health and well-being of surgeons and trainees has largely examined the prevalence and impact of physician burnout (BO), the emotional and physical exhaustion resulting from environmental factors such as workload and a sense of powerlessness in the system.[1-4] There is relatively little understanding of the experience of compassion fatigue (CF) among surgeons and surgical trainees. CF refers to the emotional and physical burden felt by those helping others in distress and results from the empathic relationship between caregivers and patients.[5,6] According to Stamm, CF is one of 2 opposing but related dimensions that comprise a person's professional quality of life (ProQOL), which is the overall experience of quality in relation to their work in a helping profession, such as health care (Fig. 1).[6] CF is a negative experience that may derive from environmental factors

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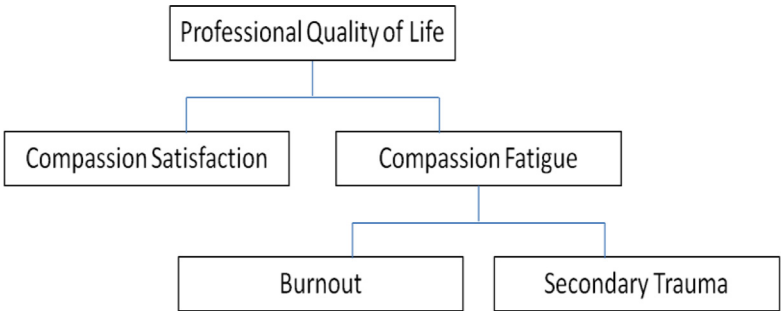

FIGURE 1. Diagram of professional quality of life.

(BO) and/or secondary traumatic stress (STS). STS involves exposure to a traumatically stressful event, is associated with rapid onset symptoms and may involve difficulty sleeping, upsetting images, or avoiding things that remind the person of the event.[6] The other dimension of ProQOL, compassion satisfaction (CS), comprises positive feelings about one's ability to help others. CS is the experienced pleasure in helping others that contributes to job satisfaction and one's sense of contributing positively to the work environment. Recognizing the varying influences of the work, client and individual contexts, CF and CS together contribute to an individual's experience of ProQOL.[6,7]

Healthcare professionals who experience satisfaction from their work may fail to recognize that they are suffering from CF despite a reduced capacity to feel empathy as a consequence of being exhausted by the suffering of others.[7] CF can affect how an individual is able to function in their job as a health care professional, as well as their own personal health and relationships.[8] Both personal and work factors contribute to CF, making some individuals and workplaces at higher risk than others. For example, a recent study demonstrated that residents working many night shifts and those working over 80 hours per week appear to be at higher risk of developing CF.[9]

CF has not been widely examined among surgeons;[10] however, surgeons may be at especially high risk of developing CF due to their unique relationship with patients. Surgeons often feel a great sense of responsibility for their patients, and when a patient experiences a complication, or dies, it can be emotionally difficult.[11,12] Surgical trainees also deal with these emotional cases and negative outcomes, but have less experience navigating these situations. Furthermore, the surgical culture perpetuates an idea that surgeons should be all-knowing and tough, and a surgeon who is perceived as overly emotional may be seen as weak within the surgical community.[13]

The symptoms and experiences contributing to CF are likely underidentified among surgical trainees. The aim of this study was to determine the prevalence and impact of CF amongst surgical trainees, with the future goal of developing a program to help prevent and/or cope with CF in a healthy manner.

METHODS

This study utilized a mixed-methods approach to collect both quantitative and qualitative data on CF among surgical trainees. This study design was deemed appropriate to quantitatively represent the scope of the problem, as well as offer some in-depth picture of trainee emotional patient encounters and responses. This research was approved by both the university and hospital research ethics board committees.

Survey Data Collection and Analysis

An anonymous survey was sent via email to surgical trainees in a large academic university surgical program (PGY-1-fellows). The survey targeted multiple surgical specialties: general surgery, neurosurgery, plastic surgery, orthopaedic surgery, urology, and vascular surgery. It explored demographics, trainees' experiences during training with stress and emotional patient encounters, coping mechanisms, and questions about which interventions regarding CF they believe may be useful to them. The survey also included the 30-item measure of CF, the Professional Quality of Life Scale Version 5 (ProQOL).[14] This inventory has subscales for the 3 components of CF: compassion satisfaction (CS – the pleasure you derive from being able to do your work well), burnout (BO – feelings of hopelessness and difficulties in dealing with work or in doing your job effectively), and secondary traumatic stress (STS – secondary exposure to extremely or traumatically stressful events). The survey remained open from March to June 2016. Data were collected through Survey Monkey.

To analyze the survey data, raw scores for each subscale were computed from the survey responses in

accordance with the ProQOL manual.[6] Means and standard deviations (SD) were calculated for each subscale. The one-sample *t* test was used to compare subscale means from our study population to normative data from a review by De La Rosa et al.[15] In this review, the authors identified 30 published papers which utilized the ProQOL instrument in caregivers. Those surveyed in these papers were predominantly nurses but included some physicians as well as other allied healthcare providers. Sample means and standard deviations from each paper were pooled to derive a grand mean and standard deviation for each subscale which can be used as a normative reference.

Furthermore, De La Rosa et al. suggest that the 25th and 75th percentile values be used as low and high cut-off scores to identify individuals with concerning and reassuring levels of CS, BO, and STS. We utilized the published normative data to derive these cut-off scores and then identified the number of respondents in our sample who fell into these concerning and reassuring groups for each subscale. The chi-square test or Fischer's exact test were used, when appropriate, to compare the proportion of respondents in each of these groups to the expected proportion derived from the normative data.

Values of $p < 0.05$ were considered statistically significant. All analyses were performed using SAS software (version 9.4; SAS Institute Inc., Cary, North Carolina). The survey is included in Appendix 1.

Interview Data Collection and Analysis

To further understand trainees' experiences, all surgery and obstetric/gynecology (OB/GYN) trainees were subsequently invited to participate in a semistructured interview. OB/GYN trainees were recruited because of the similarity in their relationship to patients as surgery trainees and their exposure to surgical rotations. A methodological approach consistent with qualitative description was used to further elicit and analyze trainees' experiences with emotional patient encounters.[16] The interviews consisted of open-ended questions about emotionally difficult experiences, how these experiences have affected them, coping mechanisms used to deal with these experiences and how effective they feel an intervention for CF would be.

All trainees who volunteered for the study were interviewed. The interviews were conducted in person or by telephone by a researcher, the senior author, who was not known to the participants. They were audio-recorded and transcribed in a deidentified manner. Two pilot interviews were first completed, transcribed, reviewed, and discussed among team members (NS, PK, and LGC) to ensure the questions and their wording captured data most relevant to the research question. Thereafter, data collection and analysis occurred iteratively and inductively using the constant comparison method.[17] The senior author coded the transcripts as they were produced, reading them multiple times to generate major themes by comparing the similarities and differences between coded segments. Subsequent to completing the interviews and coding all transcripts, discussion of the themes derived from the data and their content occurred with the team. Consensus was achieved with respect to the major findings reported. Data were managed with Nvivo 11 management software.

RESULTS

Survey Results

After 3 iterations of the email survey, the response rate was 47% (115/243). Most respondents were female (58%), general surgery trainees (42%), and aged 31 to 35 years (42%). Respondent characteristics are detailed in Table 1.

Stress at Work

When asked which parts of their job were stressful, the majority of respondents reported that the system (i.e. hospital flow, computer systems, etc.), inability to control their own schedule, heavy workload, and lack of personal time were stressful. Fewer than half of respondents indicated stress caused by interactions with

TABLE 1. Demographics

Respondent Characteristics	% of Total Respondents
Gender	
Male	42%
Female	58%
Age	
21 to 25 y	4%
26 to 30 y	36%
31 to 35 y	43%
≥36 y	17%
Surgical specialty	
General surgery	42%
Orthopedic surgery	11%
Neurosurgery	16%
Plastic surgery	10%
Urology	9%
Vascular surgery	9%
Other	3%
Postgraduate year	
PGY-1	17%
PGY-2	8%
PGY-3	16%
PGY-4	13%
PGY-5	8%
Fellow	30%
On research leave	8%

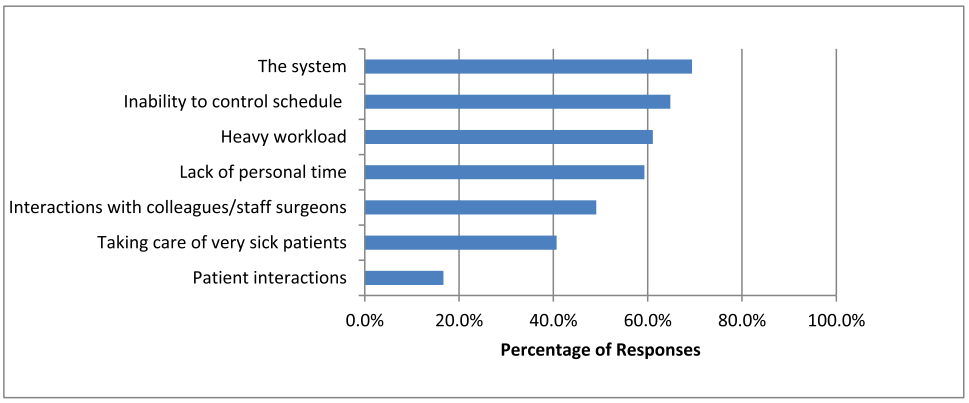

FIGURE 2. Stress at work.

patients, staff surgeons or colleagues, or by taking care of and interacting with patients (Fig. 2).

Emotional Experiences in Training

Most respondents (98%) had seen a patient die and felt personally affected by a patient's death (72%). About one third (31.5%) experienced secondary trauma by caring for a patient who had experienced trauma or death. Over half of the respondents felt that there were not adequate supports in place to help them deal with these experiences (Fig. 3).

Coping Mechanisms

When asked who they talked to about stressful or traumatic situations at work, most respondents reported their partner, resident colleagues, and friends. Only 3% used professional counseling. The majority (77%) felt that talking about the stressful situations did help them. When asked how well they managed stress, 91% reported average level or above (Fig. 4).

The large majority reported using exercise to cope with stress. Almost one quarter used alcohol. Only 6% of respondents had previously sought some form of counseling (Fig. 5).

ProQOL

Ninety-nine respondents (40.7%) completed the ProQOL tool. The mean score on the CS subscale was 36.9 (SD 6.7), on the BO subscale was 26.2 (SD 5.6), and on the STS subscale was 21.2 (SD 6.3). The mean on the CS subscale was not statistically different from the population mean derived from De La Rosa et al. ($p = 0.22$). The means for the BO and STS scales were statistically higher in our study sample compared to the normative data ($p < 0.0001$ for each) (Table 2).

Figure 5 shows how the distribution of subscale scores within our sample compared to the normative data. While it would be expected that 25% of respondents would fall within the lowest strata, 50% would fall within the middle strata, and 25% would fall within the upper strata, this was not the case for all subscales.

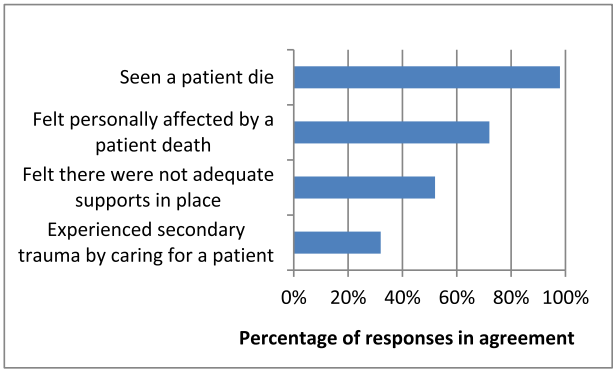

FIGURE 3. Emotional experiences in training.

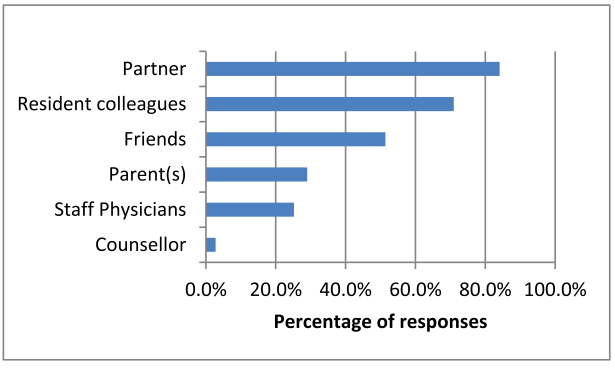

FIGURE 4. Who do you talk to about stress?

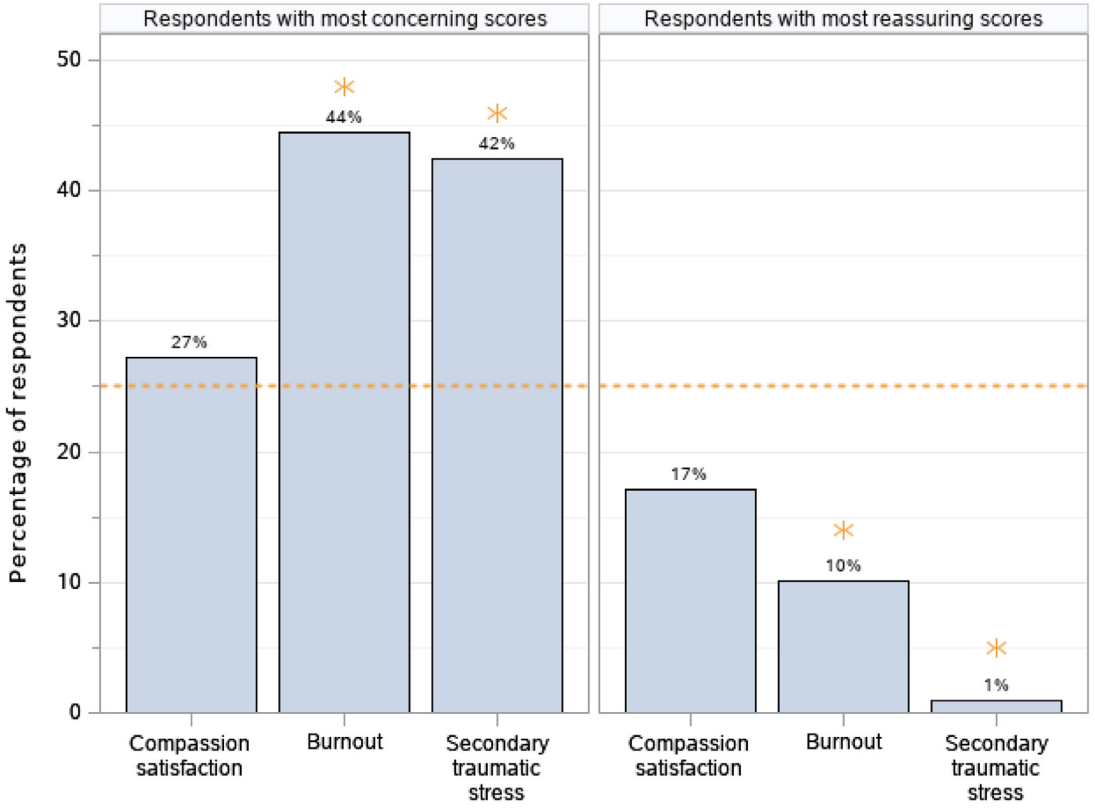

FIGURE 5. Proportion of respondents with most concerning and most reassuring scores on each subscale using normative data from De La Rosa et al. The dotted orange line indicates the expected percentage of respondents in each group based on normative data from De La Rosa et al. An asterisk above a bar indicates a statistically significant difference from the expected value.

TABLE 2. Descriptive Statistics From Study Sample and 1-Sample *t* Test Using Normative Data From De La Rosa et al.

Subscale	Sample Mean (SD)	Normative Mean (SD)	p Value
Compassion satisfaction	36.9 (6.7)	37.3 (6.5)	0.22
Burnout	26.2 (5.6)	22.8 (5.4)	<0.0001
Secondary traumatic stress	21.2 (6.3)	16.7 (5.7)	<0.0001

The CS scale demonstrated relative agreement with this expected distribution ($p = 0.40$), however the BO and STS both showed significantly fewer respondents in the lowest strata, corresponding to individuals with the least BO and STS, as well as significantly more respondents in the highest strata, corresponding to individuals with concerning levels of these undesirable attributes ($p = 0.003$ and $p < 0.0001$, respectively).

Possible Interventions

The majority of respondents (75%) felt that debriefing sessions following tough scenarios would be useful to them. Seventy percent felt that training for healthy coping mechanisms would be helpful. The respondents were divided when asked who should lead these sessions – 43% indicated a staff surgeon, 48% indicated a professional with no bearing on their clinical training. Most preferred an individual setting (57%) rather than a group setting (43%). Most (56%) felt that an intervention should be mandatory following a tough case. While some respondents (18%) felt an intervention would be most useful before an event occurs, or immediately post-stressful event (20%), the majority felt it would be more useful after some unspecified amount of decompression time (63%).

Interview Findings

Ten interviews were completed with 8 general surgery and 2 OB/GYN trainees all of whom volunteered for the study. Half of the participants were male. Six participants were junior trainees (PGY1-2), 4 were senior

trainees (PGY3-5). Thematic findings are summarized below with supporting quotes.

Defining Emotional Encounters

Almost all trainees described experiencing symptoms of CF at some point in their training. Participants attributed their emotionally difficult experiences to involvement in cases with patient complications and poor outcomes. Difficult conversations with family members in these situations were also found to be emotionally taxing: "*I look back at some of the cases that were more involving, in terms of time and energy and those definitely I could categorize as compassion fatigue" (R06*).

Some trainees indicated that observing, rather than acting in, traumatic or unexpected patient care situations had significant emotional impact, particularly among junior trainees who described not knowing what to do in these scenarios: "*I think just seeing and being part of that but not talking about it was really, really tough" (R10*).

Contributing Factors

Factors that contributed to the emotional intensity of difficult patient cases included workload and stress; perceiving other staff persons' detached responses to traumatic events; concurrent efforts to impress staff with clinical competence; and, cultural expectations. Several participants described the magnifying effects of stress, sleep deprivation or systems deficiencies on how they responded to emotional patient cases: *"I think definitely related to the amount of work I am doing and the stress of that work that my innate compassionate response decreases or completely disappears" (R03*). Many felt the need to keep their emotional responses private in order to protect their image as a competent trainee among staff and more senior team members: *"I hope that my staff are going to assume that everything is good or that I know what I am doing and feeling fine" (R02).* Some related this to an implicit cultural expectation that despite their exposure to traumatic events they should continue on as usual with daily clinical activity.

Impact of Emotional Encounters

Anxiety, feeling miserable, and irritability were among the most commonly described after-effects of emotional encounters: *"'I'm turning into a bad person' are the words that I use, and it's my way of saying I'm not myself" (R10).* Some trainees found themselves feeling extra tired and wanting more sleep. Others described avoiding lengthy conversations or a noticeable lack of empathy for patients and families: *"Just the prospect of having to take care of the patient – I dreaded that experience" (R07).* Trainees recognized the impact of not addressing their emotional reactions, on themselves and others, pointing out the enduring emotional damage that can result from poor coping over time.

Coping Strategies

Most participants described talking with partners, friends, and family as their primary way of emotionally coping. Some informally talked with other trainees and usually as a form of venting about work. Only a few described being part of a team debriefing; most used individual nonwork related activities to cope such as exercise, meditation, self-coaching, and taking personal time. Most participants did not talk with their staff as a way of coping or managing their emotional responses though some stated they would if the staff were approachable and open to it. Barriers to coping in the work environment included lack of time, a perceived expectation not to be emotional and a feeling that they would be emotionally exposed in a group setting: *"By sitting together we're now going to expose our personal feelings? More likely is that if they get to go home early that day and they still have enough mental energy, they can talk to their family and friends about it" (R01).*

Interventions

Most interviewees supported the idea of an organized program to prevent and manage CF; however, opinions varied on whether or not any sessions devoted to the topic should be mandatory. The variation reflected trainees' concerns about preservation of their anonymity from staff they directly worked with, as well as from the academic program director. They were also uncertain as to whether their time would be better spent sleeping or exercising, which were both coping strategies. However, sharing experiences with others was thought to likely be beneficial, as were debriefing and internal reflection exercises: *"Something just to reassure you that you are not the first person this is going to happen to and not the last" (R04).*

DISCUSSION

Findings from the ProQOL survey suggest that at the time of our survey administration the majority of trainees were experiencing average levels of CS, with high levels of BO and STS. According to the ProQOL manual, high levels of BO are attributable to feelings of inefficacy, high workload, and poor system function.[6] Also concerning are the high levels of STS reported. These scores reveal respondents feel overwhelmed by negative experiences they have encountered in the workplace and often work in fear of further such experiences. Despite these findings, the normal levels of CS suggest that

respondents remained gratified by their jobs and derived a sense of purpose from caregiving.

While CF has been studied widely among nurses and mental healthcare professionals, it has only more recently been examined among physicians and surgeons.[10,18-21] A recent survey of surgeons' experiences of STS found symptoms such as emotional numbing and irritability were present occasionally or more often in 35% and 50% of survey respondents, respectively.[21] This resonates among surgical trainees in the present study among whom high levels of STS were also reported and a majority felt as though there were inadequate organized support mechanisms in place. We also found symptoms of CF among trainees interviewed who described noticeable behaviors of irritability, lack of empathy, and avoidance of patients, as well as a number of barriers to coping in the hospital setting.

Many trainees identified as stressors the complex system in which they work and interact with staff. Coupled with their expressed desires to demonstrate professionalism and clinical acumen, surgical trainees face a uniquely challenging and emotionally vulnerable environment. Managing emotionally difficult patient encounters while balancing systems issues and performance evaluation truly complicates trainees' choices (or lack thereof) with respect to expressing emotional stress and seeking support. Coping with emotional stress from patient care is not a well-articulated aspect of the surgical culture or the surgical idea of professionalism. Surgeons are generally not expected to demonstrate vulnerability despite the anxiety, fear, and accountability they experience in their everyday practice.[22,23] The emotional impact of everyday surgical work is rarely if ever openly discussed. This hidden curriculum around emotionality in surgery limits opportunities for trainees to develop coping mechanisms and mitigating strategies in residency that are integrated into their work and which may be helpful in managing emotional stress as it is experienced in real time. It also limits the extent to which faculty might identify and help trainees in need as the perceived cultural expectation promotes business as usual.

The majority of trainees in this study welcomed the idea of developing an organized support program to mitigate CF but most were uncertain about what this would look like and how it could be logistically and confidentially implemented. Wellness and resiliency programs are endorsed by the Accreditation Council for Graduate Medical Education and the Royal College of Physicians and Surgeons of Canada and commonly take a holistic approach to physician and resident well-being.[24-27] These programs are designed to prepare physicians for the stress associated with residency and their careers, as well as offer resources to address burnout, and some success has been demonstrated.[28,,29] For example, the implementation of a comprehensive resident well-being and resiliency program at the University of Arizona demonstrated improvements after 1 year in residents' perceived stress, exhaustion, and life satisfaction as well as residents' perceptions of the value of the residency program.[28] However the surgical culture presents an enduring challenge that potentially affects trainees' and staff perceptions of interventions targeting CF — will a trainee be perceived as less competent for expressing emotional distress in a social context where this characteristic is neither modeled nor valued?[29] In addition, there is a cultural norm around pervasive fatigue that works against allotting protected time for wellness and coping. In other words, feeling tired and exhausted is commonplace and expressions of such are typical among trainees. A cultural shift to minimize tacit messages around the importance and necessity of time to cope, and increase trainees' sense of safety with respect to expressing emotional stress is likely needed.

Finally, the use of alcohol as a coping mechanism for stress was reported by almost one quarter of survey respondents which is a concerning finding. Among surgeons surveyed in 2010, alcohol abuse or dependence was found to be associated with surgeon mental health as well as the likelihood of reporting a medical error in the past three months.[30] With potential consequences for trainee and patient well-being and safety, interventions targeting trainees' management of occupational stress should include awareness and identification of problematic consumption of alcohol and other substances. This topic area is not currently described in the literature with respect to existing wellness programs representing an important gap that should be addressed.

Organizational and individual strategies together are promoted by experts to combat physician BO and CF.[31] Organizations must develop systematic efforts to acknowledge and address provider wellbeing, including equipping healthcare providers in practicing self-care, optimizing work hours, and a building culture of supportive mentorship and peer support.[31] Individual-level strategies for building resilience toward CF could include mindfulness, meditation practice, and establishing a support network with whom one can emotionally debrief.[32] Trainees are likely to benefit from wellness programs supported by their academic departments and the hospital in which they work that promote a culture of emotional wellbeing through open dialogue and observable role modeling of faculty efforts to manage their occupational health.

Limitations

The generalizability of the study findings may be limited by potential nonresponse bias and the fact that this was

a single institution study. The study findings may also be limited by potential selection bias in the form of an overrepresentation of female respondents. Given the small sample size of qualitative interviews, transferability of findings may also be limited. In addition, the participating populations for the survey and interviews differed with respect to the inclusion of fellows and OBGYN trainees representing another limitation. We were challenged to recruit surgical trainees to participate in the interview and therefore expanded the sample to include OBGYN trainees because of the similarity of their relationships to patients and their exposure to surgical rotations. Fellows were invited to participate in the interviews however no fellows were recruited.

Conclusion

Surgical trainees report high levels of burnout and secondary traumatic stress and currently use informal coping strategies outside of their academic and hospital environments. This study has identified barriers to organizing a program to mitigate CF at a cultural level whereby trainees largely avoid showing their emotional struggles for fear of appearing incompetent. Trainees are likely to welcome and benefit from an organized and collective response from academic departments, hospital programs and individual staff to support their emotional health in difficult patient encounters. Further research is needed to determine optimal ways to engage surgical faculty and trainees in CF management.

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REFERENCES

1. Balch CM, Freischlag JA, Shanafelt TD. Stress and burnout among surgeons: understanding and managing the syndrome and avoiding the adverse consequences. *Arch Surg*. 2009;144:371–376. https://doi.org/10.1001/archsurg.2008.575.
2. Fothergill A, Edwards D, Burnard P. Stress, burnout, coping and stress management in psychiatrists: findings from a systematic review. *Int J Soc Psychiatry*. 2004;50:54–65.
3. Shanafelt TD, Oreskovich MR, Dyrbye LN, et al. Avoiding burnout: the personal health habits and wellness practices of US surgeons. *Ann Surg*. 2012;255:625–633. https://doi.org/10.1097/SLA.0b013e31824b2fa0.
4. Shanafelt TD, Balch CM, Bechamps GJ, et al. Burnout and career satisfaction among American surgeons. *Ann Surg*. 2009;250:463–471. https://doi.org/10.1097/SLA.0b013e3181ac4dfd.
5. Figley CR, ed. Brunner/Mazel Psychological Stress Series, No. 23. Compassion Fatigue: Coping with Secondary Traumatic Stress Disorder in Those Who Treat the Traumatized. 1995, Philadelphia, PA, US: Brunner/Mazel.
6. Stamm BH. The Concise ProQOL Manual. 2nd ed. Pocatello, ID: ProQOL.org; 2010.
7. Adams RE, Boscarino JA, Figley CR. Compassion fatigue and psychological distress among social workers: a validation study. *Am J Orthopsychiatry*. 2006;76:103–108. https://doi.org/10.1037/0002-9432.76.1.103.
8. Sabo B. Reflecting on the concept of compassion fatigue. *Online J Issues Nurs*. 2011;16:1. https://doi.org/10.3912/OJIN.Vol16No01Man01.
9. Bellolio MF, Cabrera D, Sadosty. Compassion fatigue is similar in emergency medicine residents compared to other medical and surgical specialties. *West J Emerg Med*. 2014;15(6):629–635.
10. Wu D, Gross B, Rittenhouse K, et al. A preliminary analysis of compassion fatigue in a surgeon population: are female surgeons at heightened risk? *Am Surg*. 2017;83:1302–1307.
11. Luu S, Leung SO, Moulton CA. When bad things happen to good surgeons: reactions to adverse events. *Surg Clin N Am*. 2012;92:153–161. https://doi.org/10.1016/j.suc.2011.12.002.
12. Cassell J, Buchman TG, Streat S, et al. Surgeons, intensivists, and the covenant of care: administrative models and values affecting care at the end of life—updated. *Crit Care Med*. 2003;31:1551–1557. discussion 57-9.
13. Hill E, Vaughan S. The only girl in the room: how paradigmatic trajectories deter female students from surgical careers. *Med Educ*. 2013;47:547–556. https://doi.org/10.1111/medu.1213.
14. Stamm BH. Professional Quality of Life: Compassion Satisfaction and Fatigue Version 5 (ProQOL). 2009 www.ProQOL.org.
15. De La Rosa GM, Webb-Murphy JA, Fesperman SF, et al. Professional quality of life normative

benchmarks. Psychol Trauma: Theory Res Pract Policy. 2018;10:225–228.

16. Sandelowski M. Whatever happened to qualitative description? *Res Nurs Health*. 2000;23:334–340.

17. Ryan GW, Bernard HR. Techniques to identify themes. *Field Methods*. 2003;15:85–109.

18. van Mol MM, Kompanje EJ, Benoit DD, et al. The prevalence of compassion fatigue and burnout among healthcare professionals in intensive care units: a systematic review. *PLoS One*. 2015;10:e0136955. https://doi.org/10.1371/journal.pone.0136955.

19. Haik J, Brown S, Liran A, et al. Burnout and compassion fatigue: prevalence and associations among Israeli burn clinicians. *Neuropsychiatr Dis Treat*. 2017;13:1533–1540. https://doi.org/10.2147/ndt.s133181.

20. Berg GM, Harshbarger JL, Ahlers-Schmidt CR, et al. Exposing compassion fatigue and burnout syndrome in a trauma team: a qualitative study. *J Trauma Nurs*. 2016;23:3–10. https://doi.org/10.1097/jtn.0000000000000172.

21. Warren AM, Jones AL, Shafi S, et al. Does caring for trauma patients lead to psychological stress in surgeons? *J Trauma Acute Care Surg*. 2013;75:179–184.

22. Orri M, Farges O, Clavien PA, et al. Being a surgeon—the myth and the reality: a meta-synthesis of surgeons' perspectives about factors affecting their practice and well-being. *Ann Surg*. 2014;260:721–728. https://doi.org/10.1097/sla.0000000000000962. discussion 28-9.

23. Orri M, Revah-Levy A, Farges O. Surgeons' emotional experience of their everyday practice - a qualitative study. *PLoS One*. 2015;10:e0143763. https://doi.org/10.1371/journal.pone.0143763.

24. Salles A, Liebert CA, Esquivel M, et al. Perceived value of a program to promote surgical resident well-being. *J Surg Ed*. 2017;74:921–927. https://doi.org/10.1016/j.jsurg.2017.04.006.

25. Accreditation Council for Graduate Medical Education. Improving physician well-being, restoring meaning in medicine Chicago, IL2018. http://www.acgme.org/What-We-Do/Initiatives/Physician-Well-Being Accessed September 14 2018.

26. Puddester D, Flynn L, Cohen J. CanMEDS Physician Health Guide: A Practical Handbook for Physician Health and Well-Being. In: Frank JR, ed. Editor 2009, Ottawa: Royal College of Physicians and Surgeons of Canada.

27. Riall TS, Teiman J, Chang M, et al. Maintaining the fire but avoiding burnout: implementation and evaluation of a resident well-being program. *J Am Coll Surg*. 2018;226:369–379. https://doi.org/10.1016/j.jamcollsurg.2017.12.017.

28. West CP, Dyrbye LN, Rabatin JT, et al. Intervention to promote physician well-being, job satisfaction, and professionalism: a randomized clinical trial. *JAMA Intern Med*. 2014;174:527–533. https://doi.org/10.1001/jamainternmed.2013.14387.

29. Jin CJ, Martimianakis MA, Kitto S, et al. Pressures to "measure up" in surgery: managing your image and managing your patient. *Ann Surg*. 2012;256:989–993. https://doi.org/10.1097/SLA.0b013e3182583135.

30. Oreskovich MR, Kaups KL, Balch CM, et al. Prevalence of alcohol abuse among surgeons. *Arch Surg*. 2012;147:168–174.

31. Shanafelt TD, Noseworthy JH. Executive leadership and physician well-being: nine organizational strategies to promote engagement and reduce burnout. *Mayo Clin Proc*. 2017;92:129–146. https://doi.org/10.1016/j.mayocp.2016.10.004.

32. Mathieu F. Occupational hazards: compassion fatigue, vicarious trauma and burnout. *Can Nurse*. 2014;110:12–13.

SUPPLEMENTARY INFORMATION

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.jsurg.2019.03.012.

APPENDIX A : SURVEY TEMPLATE FOR SURGICAL TRAINEES

Demographics:

1. Which surgical specialty are you in?
   a. General surgery
   b. Orthopedic surgery
   c. Otolaryngology
   d. Neurosurgery
   e. Plastic surgery
   f. Urology
   g. Vascular surgery
   h. Other (please indicate)
2. What is your level of training?
   a. PGY-1
   b. PGY-2
   c. PGY-3
   d. PGY-4
   e. PGY-5
   f. Research
   g. Fellow
3. What is your gender?
   a. Male
   b. Female
4. What is your age range?
   a. <21
   b. 21-25
   c. 26-30
   d. 31-35
   e. >36
5. What is your marital status?
   a. Single
   b. In a relationship
   c. Married
   d. Divorced
6. Do you have children?
   a. Yes (If so how many?)
   b. No

Experiences in Training

1. Which parts of your job do you find stressful? (Check all that apply)
   a. Patient interactions
   b. Interactions with colleagues/staff surgeons
   c. Taking care of very sick patients
   d. Heavy workload
   e. "The system" (i.e., hospital flow, computer systems etc.)
   f. Lack of personal time
   g. Inability to control schedule
2. Have you ever seen a patient die?
   a. Yes (if yes, please describe)
   b. No
3. I have been personally affected by a patient's death.
   a. Strongly disagree
   b. Disagree
   c. Agree
   d. Strongly agree
4. I have been in a situation during my training where I experienced 'secondary trauma' by caring for a patient who experienced trauma/death themselves.
   a. Strongly disagree
   b. Disagree
   c. Agree
   d. Strongly agree
5. Please answer this question if you have experienced the situations described in 2, 3 and/or 4. I feel there were adequate supports in place to help me deal with these experiences.
   a. Strongly disagree
   b. Disagree
   c. Agree
   d. Strongly agree
   e. I did not experience the situations described in 2, 3 and/or 4.

Coping Mechanisms

1. Who do you talk to about stressful/traumatic situations at work? (please check all that apply)
   a. Partner
   b. Friends
   c. Resident colleagues
   d. Staff physicians
   e. Parent(s)
   f. Counselor
   g. Other (please indicate)
2. Do you feel that talking to someone about the stressful/traumatic situations helps?
   a. Not at all
   b. A little bit
   c. Moderately
   d. Very much
3. When do you talk to people about the stressful/traumatic situation?
   a. Immediately following the event
   b. After I've had a chance to decompress a bit
   c. Whenever it comes up in conversation
   d. It varies

4. How do you think you manage stress?
   a. Very poorly
   b. Poorly
   c. Average
   d. Well
   e. Very well
5. Do you use any of the following coping mechanisms to help you deal with stress? (Check all that apply)
   a. Exercise
   b. Yoga
   c. Mindfulness/meditation
   d. Alcohol
   e. Professional counseling
   f. Other (please specify)

Professional Quality of Life Scale

ProQOL Version 5 (2009)

When you take care of people you have direct contact with their lives. As you may have found, your compassion for those you help can affect you in positive and negative ways. Below are some questions about your experiences, both positive and negative, as a health-care provider. Consider each of the following questions about you and your current work situation. Select the number that honestly reflects how frequently you experienced these things **in the last 30 days**.

1=Never
2=Rarely
3=Sometimes
4=Often
5=Very often

1. I am happy ___
2. I am preoccupied with more than one person I take care of ___
3. I get satisfaction from being able to help people ___
4. I feel connected to others ___
5. I jump or am startled by unexpected sounds ___
6. I feel invigorated after working with patients ___
7. I find it difficult to separate my personal life from my life as a resident ___
8. I am not as productive at work because I am losing sleep over traumatic experiences of a patient I've helped ___
9. I think that I might have been affected by the traumatic stress of the patients I've helped ___
10. I feel trapped by my job as a resident ___
11. Because of my work in residency, I have felt "on edge" about various things ___
12. I like my work as a surgical resident ___
13. I feel depressed because of the traumatic experiences of the patients I have worked with _
14. I feel as though I am experiencing the trauma of a patient I have helped ___
15. I have beliefs that sustain me ___
16. I am pleased with how I am able to keep up with surgical techniques and protocols ___
17. I am the person I always wanted to be ___
18. My work makes me feel satisfied ___
19. I feel worn out because my work as a resident ___
20. I have happy thoughts and feelings about those I help and how I could help them ___
21. I feel overwhelmed because my workload seems endless ___
22. I believe I can make a difference through my work ___
23. I avoid certain activities or situations because they remind me of frightening experiences of the patients I have helped ___
24. I am proud of what I can do to help patients ___
25. As a result of my work, I have intrusive, frightening thoughts ___
26. I feel "bogged down" by the system ___
27. I have thoughts that I am a "success" as a surgical resident ___
28. I can't recall important parts of my work with trauma victims ___
29. I am a very caring person ___
30. I am happy that I chose to do this work ___

Intervention for CF in residents

1. Which of the following types of interventions do you think would be useful to help residents cope with CF of caring for patients? (check all that apply)
   a. Debriefing sessions following "tough cases/ patient scenario"
   b. Training for healthy coping mechanisms i.e., mindfulness
2. Who would you want to lead these types of sessions?
   a. A staff surgeon
   b. A staff psychiatrist
   c. A professional who has no bearing on your clinical training
3. Which of the following settings would this intervention be most useful?
   a. Group setting
   b. Individual setting

4. I think an intervention like this should be mandatory following a "tough case/patient scenario".
   a. Strongly disagree
   b. Disagree
   c. Agree
   d. Strongly agree
5. When would be the most useful timing for an intervention?
   a. Prophylactically for everyone before an event occurs
   b. Immediately post-stressful event
   c. After I have had some time to decompress and deal with the event on my own
6. I think an intervention to help residents deal with CF would be useful to me.
   a. Strongly disagree
   b. Disagree
   c. Agree
   d. Strongly agree
7. What features would be important to you in deciding to attend an intervention to help you deal with CF?
   a. Please write your ideas in the box