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Identifying Contextual Workplace Stressors in a Division of Plastic and Reconstructive Surgery

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Background: Healthcare professionals in plastic and reconstructive surgery (PRS) face unique stressors that contribute to burnout, increasing the risk of errors and compromising patient care. Despite this, there is limited research on PRS burnout in the United States. This study aimed to measure burnout rates and identify high-impact improvement targets within a PRS division at a US academic medical center.
Methods: A sequential mixed-methods study was conducted, involving systems analysis and contextual design methods. All surgeons (n = 5) and nonsurgeons (n = 9) were invited to participate (total n = 14). Burnout rates were measured, and workplace stressors were identified using surveys, focus groups, and contextual inquiries. High-impact, low-effort improvement targets were determined through impact-effort matrices.
Results: Survey data from 13 respondents revealed an 85% burnout rate. Three focus groups and 14 contextual inquiries were conducted. After 13 participants validated and prioritized 2 affinity diagrams and provided 24 high-priority stressors, 8 respondents completed 2 surveys that yielded 6 high-impact/low-effort targets for organizational improvement efforts.
Conclusions: This study highlights the high prevalence of burnout in PRS and identifies specific improvement targets for both surgeons and nonsurgeons. Findings suggest strategies such as improving respect and recognition for surgeons and streamlining clinic flow for nonsurgeons. Implementing these targeted improvements can enhance the well-being of healthcare professionals and ultimately improve patient care. The study's methods can be replicated by other healthcare organizations to identify and address burnout-related issues effectively. *(Plast Reconstr Surg Glob Open 2025; 13:e6525; doi: 10.1097/GOX.0000000000006525; Published online 10 February 2025.)*

INTRODUCTION

Burnout is a persistent occupational phenomenon[1] that results from chronic environmental stress and is characterized by emotional exhaustion (EE), depersonalization (DP), and feelings of low achievement. Individual characteristics (such as genetic traits and coping styles or medical and cognitive status) can exacerbate or mitigate the effect of stress.[2,3] Prevalence of burnout is high among healthcare professionals but varies between specialties[4–6] and is consistently higher between physicians and nurses than non-healthcare professionals.[7,8] Healthcare professionals with burnout are more likely to commit medical errors that can lead to harm.[9–11]

Plastic and reconstructive surgery (PRS) includes cosmetic or aesthetic surgery and surgical repair of congenital deformities, posttraumatic injuries, and postsurgical reconstruction, including hand, facial, and peripheral nerve surgery.[12] PRS often follows procedures performed by other specialties, so plastic surgeons may experience stress from liaising with other disciplines and uncertainty in scheduling and work hours. Surgeons also perceive that other disciplines do not fully appreciate their importance

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in care delivery.[12,13] We located no burnout rates for PRS professionals in the United States post 2014 where validated instruments were used. Studies between 2011 and 2014 report rates of 29%–37% in PRS professionals.[14–18] However, burnout rates have sharply increased since 2020,[6,19] with high rates reported among physicians (56%–63%),[6,19] nurses (57%–60%),[19] and administrative staff (46%).[4] Given the recent evidence of increased burnout rates combined with a paucity of PRS-specific data, more studies are needed that measure burnout and identify workplace stressors in PRS.[20,21]

Taking a human factors and systems engineering approach, the National Academy of Medicine (NAM) proposed a theoretical systems model that describes the hierarchical levels interacting to contribute to burnout and professional well-being.[22] This researcher-initiated pilot study utilizes NAM's model to use a systems approach with contextual design methods[23] to examine the work-system factors that contribute to burnout in the PRS division of a large US academic medical center, both identifying and prioritizing workplace stressors for targeted improvement efforts. Our team used a similar approach to identify workplace stressors in a recent study of hospitalists,[24] but we have identified no other studies that have applied this approach to PRS.

Takeaways

Question: What are the work-system factors that contribute to burnout in the plastic and reconstructive surgery division of a large US academic medical center?

Findings: This sequential mixed-methods study used systems analysis and contextual inquiry methods to measure and model burnout in a plastic and reconstructive surgery division (n = 14) at a US academic medical center. Eighty-five percent of survey participants had burnout. Twenty-four high-priority stressors and 6 high-impact, low-effort targets for organizational improvement efforts were identified.

Meaning: This research highlights specific areas for improvements needed in the plastic and reconstructive surgery division, offering a practical and thorough approach to identifying workplace stressors that lead to burnout.

METHODS

Participants

The study was deployed in a PRS division of 5 surgeons and 9 nonsurgeons consisting of advanced practice providers, nurses, and administrative staff (n = 14) at a large US academic medical center. All surgeons and nonsurgeons were invited to participate. Residents were outside the scope of the study, so not included.

Study Overview

Our mixed-methods, sequential, participatory, and data-driven study design used a systems approach[22] with contextual design methods[23] to measure burnout and identify workplace stressors as part of a wider well-being program. Figure 1 shows an overview of the study. Participation was voluntary, participants could withdraw from any phase at any time, and participants received protected time if needed to complete these activities. Informed consent was obtained in writing before the start of the study and verbally at the start of each phase. Participants were informed that all data gathered would be aggregated and that no identifying information would be reported. The study protocol was reviewed and approved by the institutional review board (no. 20-2359). The Consolidated Criteria for Reporting Qualitative Research guideline was used to ensure completeness of reporting.[25] The data collection and analysis team had no prior relationship with the participants.

Survey

Division members were each emailed a link to an electronic survey. Data collected were anonymous and data identifiers were not tracked. There were no compulsory questions. Participants were given 30 minutes of protected work time to complete the survey. The survey included demographics, an abbreviated 2-item Maslach Burnout Inventory (MBI) that measured EE, DP,[26] and 21 workplace stressor items (Table 1) based on the NAM model.[22] The MBI part of the survey included 2 statements where participants selected responses on a 6-point Likert scale. One item measured EE ("I feel burned out from my work") and the other measured DP ("I have become more callous toward people since I took this job"). Response options were "a few times a year or less," "once a month or less," "a few times a month," "once a week," "a few times a week," and "every day."[26] A summative score of greater than 3 for EE and DP was used to indicate burnout. Workplace stressors were rated for severity using a 5-point Likert scale (from strongly disagree to strongly agree) and for priority using a 4-point Likert scale (not an issue, low priority, medium priority, and high priority). Each workplace stressor item included a text response field for elaboration. A separate free-text comment field was included at the end. Survey questions are shown as text in Supplemental Digital Content 1. (See **Supplemental Digital Content 1** for a summary of the survey deployed to the division between January 31 and February 7, 2022, **http://links.lww.com/PRSGO/D841**.)

Focus Groups

We conducted 3 focus groups to gather contextual details about the most severe and the highest priority workplace stressors that were identified in the survey.

Contextual Inquiries

Contextual inquiries (CIs) were conducted to gain insights into workplace stressors and identify specific breakdowns in day-to-day operations that may not have been evident in the survey and focus groups.[23] Participation was voluntary and open to all division members. All volunteers were observed and interviewed. Surgeons were observed in the operating room (OR) and clinic contexts, resulting in 10 CI sessions. Nonsurgeons were observed in

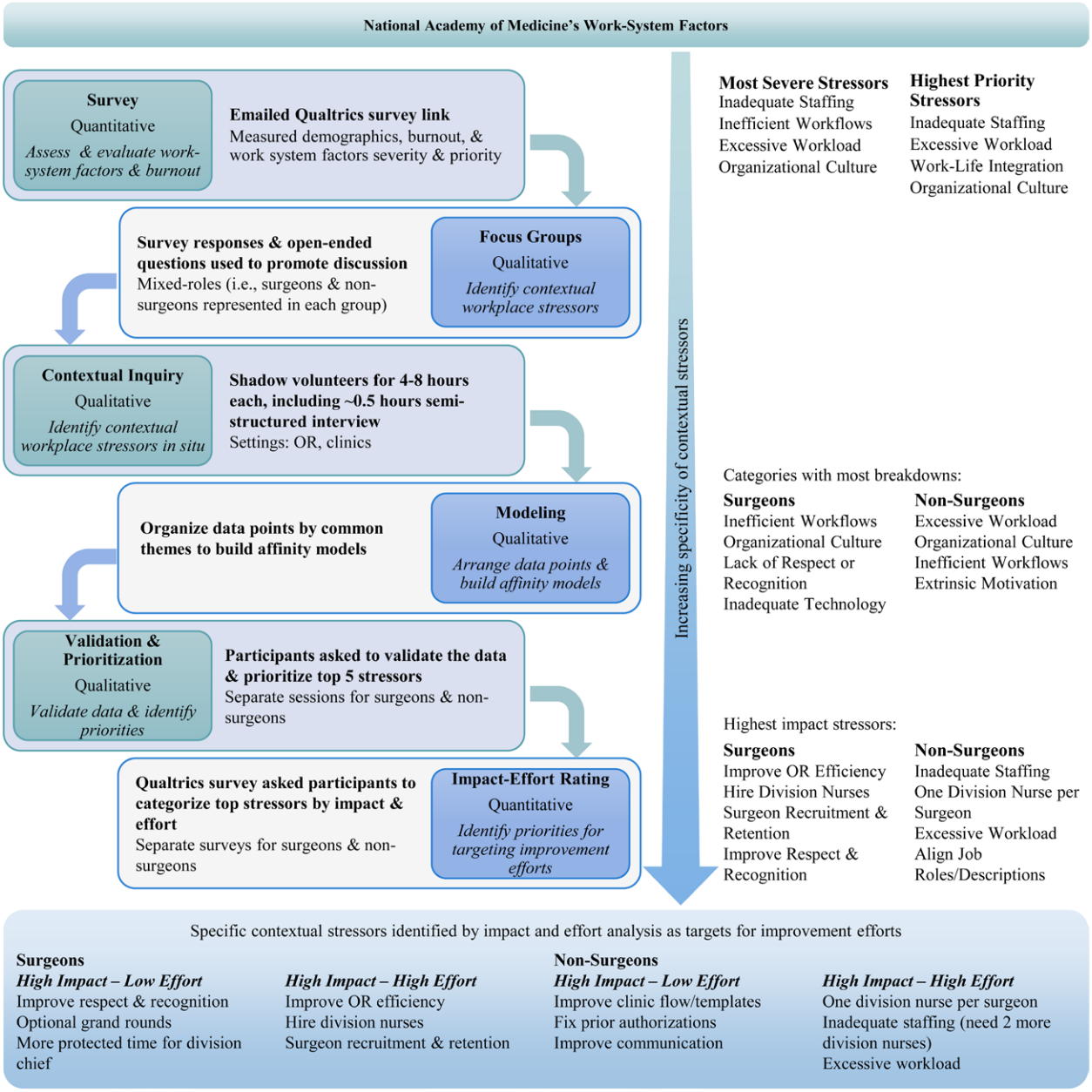

Fig. 1. Study overview. Starting from NAM's theoretical work-system factors,[22] the survey measured burnout and gathered data on the perceived severities and priority ratings for each workplace stressor. Focus groups then allowed participants to interact with viewpoints other than their own and gathered group-level contextual insights into the highest severity stressors from the survey. CIs[23] then provided a deeper contextual understanding of stressors through observation and interview. Consolidation of data points and modeling[23] of data points allowed researchers to identify common themes and provided participants with ordered groups of breakdowns that they could validate. Finally, participants rated their highest priority stressors for impact and effort, and impact-effort matrices allowed the identification of high-impact stressors that can be targeted for organizational improvement initiatives.

clinics only, resulting in 4 CI sessions (total CI sessions = 14). Each CI involved 1 or 2 data collection team members shadowing a participant for 4–8 hours, observing and taking paper-based notes. Participants were encouraged to describe their tasks when appropriate. Observers would ask questions when doing so was not interrupting the workflow. Each shadowing session was followed by a short (approximately 0.5 h) semistructured interview. The interview's purpose was to allow participants to clarify or elaborate on observations. Interviews were conducted in a private location, such as a conference room or empty break room. At the end of each CI, the participant reviewed and validated the observation and interview notes for accuracy, and any information that the participant did not want to share was removed from the notes. Each CI was followed by an interpretation session wherein findings were shared and discussed with the rest of the data collection and analysis team.

Table 1. Ratings and Ranking of the Extent to Which Workplace Stressors Contribute to PRS Team Members' Burnout

	Severity		Priority	
Workplace Stressor	Rank	Mean (SD) (n = 13)	Rank	Mean (SD) (n = 13)
Inadequate staffing	1	2.5 (1.78)	1	2.17 (1.19)
Inefficient workflows	2	2.42 (1.51)	6	1.75 (1.22)
Excessive workload	3	2.33 (1.5)	1	2.17 (1.03)
Organizational culture	3	2.33 (1.44)	4	1.92 (0.9)
Time pressure	5	2.17 (1.53)	10	1.25 (1.14)
Extrinsic motivations and rewards	5	2.17 (1.4)	5	1.83 (1.11)
Administrative burden	7	2.08 (1.62)	9	1.33 (1.15)
Work-life integration	7	2.08 (1.44)	3	2.08 (1)
Interruptions and distractions	9	2 (1.6)	8	1.42 (1)
Lack of recognition for quality improvement activities	9	2 (1.35)	16	1.08 (0.9)
Values and expectations alignment	9	2 (1.6)	6	1.75 (1.36)
Lack of dedicated time for professional development requirements	12	1.92 (1.51)	14	1.17 (1.11)
Physical work environment	12	1.92 (1.31)	14	1.17 (0.83)
Patient stressors	14	1.75 (1.36)	16	1.08 (0.9)
Job control (flexibility and autonomy)	15	1.67 (1.3)	10	1.25 (1.06)
Unmanageable work schedules	16	1.58 (1.44)	19	0.92 (1)
Intrinsic motivations and rewards	17	1.5 (1.31)	18	1 (0.95)
Professional relationships	18	1.42 (1.31)	10	1.25 (1.22)
Inadequate technology implementation	19	1.33 (0.89)	19	0.92 (0.79)
Lack of support for research and teaching	19	1.33 (1.56)	10	1.25 (0.97)
Moral distress	21	1.25 (1.36)	21	0.83 (0.94)

Modeling

Using qualitative data aggregated from survey comments, focus groups, and CIs, breakdowns were identified and categorized as per the NAM model[22] and were modeled as per the methodology described by Holtzblatt and Beyer.[23] Two affinity models were created—one to depict breakdowns experienced by surgeons and another for nonsurgeons. This was because surgeon and nonsurgeon roles and contexts were likely to differ, so their contextual workplace breakdowns would also likely differ. The models were created by taking each breakdown as a data point and grouping them into themes based on researchers' perceptions of similarities. Modeling provided visualizations of similarities and connections between individual breakdowns, providing a picture of the breakdowns in relation to workplace stressors.

Validation and Prioritization

Affinity models were presented to participants for validation. Separate sessions were held for surgeons and nonsurgeons. Individuals were asked to validate the affinity models. They were given red and blue pens and were asked to mark any breakdowns that they disagreed with in red; to annotate, amend, or elaborate in blue; and to leave unmarked any breakdowns that they agreed with. Participants were then asked to state their 5 highest priority stressors.

Impact and Effort Rating

The highest priority stressors from each validation and prioritization session were consolidated. Participants classified each priority by level of impact (high, medium, or low) and level of effort (high, medium, or low). Based on these, 2 impact-effort matrices were plotted—one for surgeons and another for nonsurgeons. Using the matrices, high-impact and low-effort stressors were identified as top-priority targets for organizational improvement efforts.

RESULTS

The study took place between January and April 2022. To preserve the anonymity of participants in the small division (n = 14), demographic data, focus group data, CI data, and affinity models are not shared. Figure 1 provides an overview of the study results at each phase.

Survey

The survey was deployed between January 31 and February 7, 2022. Of the 14 people surveyed, 13 responses (93%) were received. The MBI scores averaged 3.5 (SD 2.1) for EE and 2.4 (1.5) for DP. Overall, 85% (n = 11 of 14) of respondents met the criteria for burnout. Survey response rates were 100% for surgeons (n = 5/5) and 89% (n = 8 of 9) for nonsurgeons (total = 93% [n = 13 of 14]). The MBI scores averaged 3.5 (SD 2.1) for EE and 2.4 (1.5) for DP. Overall, 85% (n = 11 of 14) of respondents met the criteria for burnout (surgeons: 80% [n = 4 of 5]; nonsurgeons: 87.5% [n = 7 of 8]). The stressors rated as highest severity were inadequate staffing (mean 2.5 [SD 1.78]), inefficient workflows (2.42 [1.51]), excessive workload (2.33 [1.5]), and organizational culture (2.33 [1.44]). Table 1 lists all the stressors' severity and priority rankings.

Focus Groups

Three focus groups were held on February 8 and 9, 2022 (facilitated: K.A., assisted: V.G., E.K.). Each lasted 45–60 minutes and included 4–5 participants. The total participation rate was 93% (n = 13 of 14). Due to COVID-19 pandemic

Table 2. Results From the Impact-effort Surveys in Order of Impact Rank (1 = Highest Impact)

Impact Rank	Improvement Target	Impact	Effort
Surgeons		(n = 3)	(n = 3)
1	Improve OR efficiency	3	2
2	Hire division nurses	3	2
3	Surgeon recruitment and retention	3	1
4	Improve respect and recognition	2	−1
5	Optional grand rounds	1	−2
6	Support reconstructive programs	1	2
7	Provide more protected time for division chief	1	−1
8	Change children's OR leadership	0	1
9	Improve understanding and appreciate roles	0	−2
10	Provide additional clinic space	−1	2
11	Prioritize quality improvement protected time	−2	0
12	Involve microsurgeons in decision-making	−2	−3
13	Delete EHR secure chat	−3	−3
Nonsurgeons		(n = 4)	(n = 5)
1	One division nurse per surgeon	4	5
2	Inadequate staffing	4	5
3	Excessive workload	3	3
4	Align job roles/descriptions	1	2
5	Improve communication	1	−2
6	Clinic flow/templates	1	0
7	Fix prior authorizations	1	−1
8	Fix equipment	0	0
9	Professional inclusion	−3	−3
10	Professional opportunities	−4	−5

EHR, electronic health record. **Supplemental Digital Content 3**, **http://links.lww.com/PRSGO/D843**.

restrictions in place, the focus groups were held virtually using a videoconferencing tool. Surgeons and nonsurgeons were represented in each group. Quantitative results for the most severe and the highest priority workplace stressors were presented to participants, as were anonymized and summarized comments from the 7 most severe stressors, with severity rankings of 1–5 (Table 1). After participants had read and considered the stressor on each presentation slide, open-ended questions were used to promote discussion. Participants were asked to focus on talking about the problems in the system and to avoid speculation about possible solutions. Sessions were audio recorded.

Contextual Inquiries

CIs took place between February 12 and March 10, 2022, and were conducted by 1 or 2 data collection team members trained in CIs. The overall participation rate was 64% (n = 9 of 14). Participation was 100% (n = 5 of 5) for surgeons and 44% (n = 4 of 9) for nonsurgeons. Data from the CI sessions were incorporated into the affinity models. Latter CI sessions tended towards reiterating breakdowns that were already identified, indicating data saturation.

Modeling

Two affinity models were created (coders: A.K., V.G., E.K.)—one to depict the breakdowns experienced by the surgeons and another for nonsurgeons. This was because surgeon and nonsurgeon roles and contexts differ considerably, so their contextual workplace breakdowns were likely to also differ. As nonsurgeons would not be able to concur with or validate many surgeon breakdowns (eg, those that occur in the OR), separate affinity models were created. The surgeons' affinity model had 131 breakdowns and the nonsurgeons' affinity model had 87. The themes with the most breakdowns for surgeons were inefficient workflows (no. breakdowns = 51), organizational culture (19), and lack of respect and recognition (14). For nonsurgeons, the themes were excessive workload (20), organizational culture (18), and inefficient workflows (13). (**See figure, Supplemental Digital Content 2**, which shows redacted validated models, **http://links.lww.com/PRSGO/D842**.)

Validation and Prioritization

Two validation and prioritization sessions, one for surgeons and another for nonsurgeons, were held on March 11 and March 15, 2022 (facilitator: K.A., assisted: V.G., E.K.). The overall participation rate for the validation and prioritization sessions was 93% (n = 13 of 14). Participation was 100% (n = 5 of 5) for surgeons and 89% (n = 8 of 9) for nonsurgeons. For surgeons, consensus (100% agreement among participants) was found for 74% of breakdowns. Sixteen percent of breakdowns had some level of disagreement, and 10% of the breakdowns were specific to only 1 clinic or OR site (site-specific). As such, breakdowns did not pertain to all participants in the group, and consensus and levels of agreement could not be ascertained. The values for nonsurgeons were 91% consensus, 6% disagreement, and 3% site-specific.

Each participant suggested their top 5 priorities for improvement. Surgeons suggested a total of 25 priorities (5 participants × 5 priorities), which were consolidated into 13 distinct priorities. Nonsurgeons suggested 40 priorities (8 participants × 5 priorities), which were grouped into 10 distinct priorities. These are shown in Table 2.

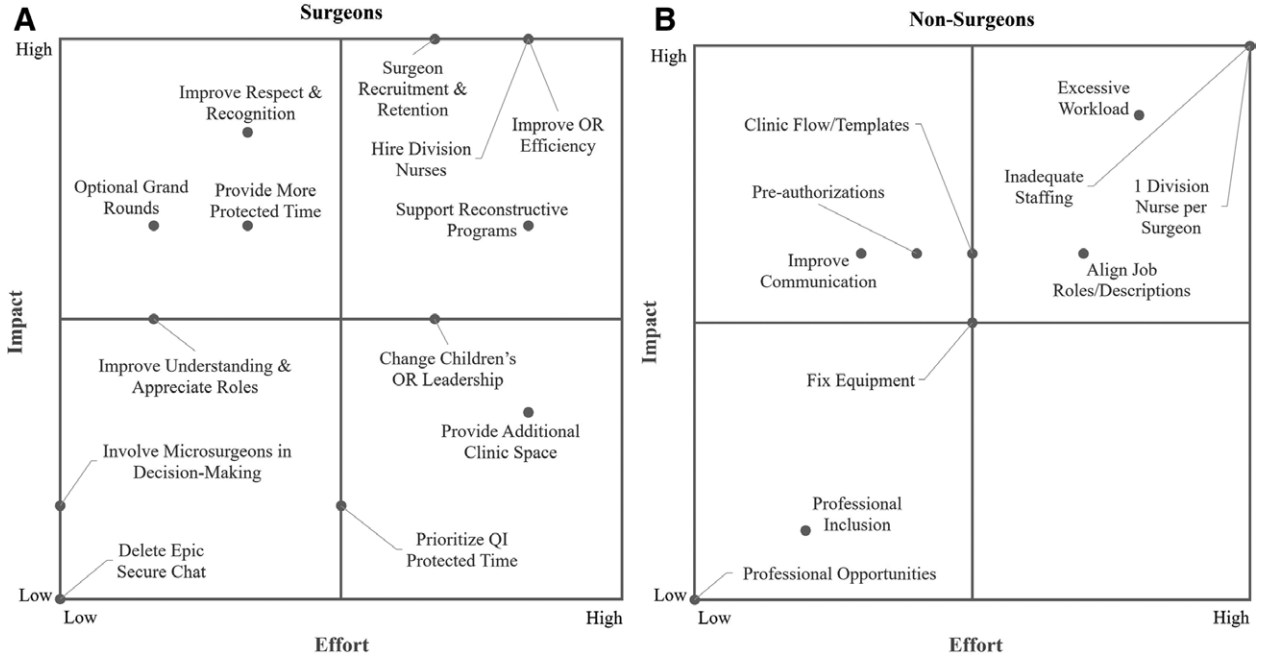

Fig. 2. Impact-effort matrices for surgeons (A) and nonsurgeons (B).

Impact/Effort Rating

The highest priority stressors from the validation and prioritization session were consolidated into 2 brief surveys, 1 for surgeons and another for nonsurgeons, which were deployed from March 16 to April 10, 2022. Overall participation in the impact-effort survey was 57% (n = 8 of 14). The surgeon participation rate was 60% (n = 3 of 5), and the nonsurgeon participation rate was 44% (n = 4 of 9) for impact and 56% (n = 5 of 9) for effort, as 1 nonsurgeon participant completed the effort portion of the survey only. The highest impact ratings from surgeons were for improving faculty recruitment and retention, improving OR efficiency, and hiring more division nurses. For nonsurgeons, the highest impact ratings were to have 1 division nurse per surgeon, improve staffing, and address excessive workload. High-impact and low-effort improvement targets for surgeons were to improve respect and recognition, make departmental grand rounds optional, and provide more protected time. For nonsurgeons, they were to improve clinic flow/templates, fix problems with prior authorizations, and improve communication. Descriptions of priority targets are shown in Table 2. (**See appendix, Supplemental Digital Content 3**, which displays a summary of 2 impact-effort surveys, **http://links.lww.com/PRSGO/D843**.) The resulting impact-effort matrices are shown in Figure 2A for surgeons and Figure 2B for nonsurgeons.

DISCUSSION

This study established an 85% burnout rate in the PRS division (surgeons: 80% [n = 5]; nonsurgeons: 87.5% [n = 8]) and identified targets for improvement for surgeons. Targets included improving respect and recognition, making departmental grand rounds optional, and providing more protected time. For nonsurgeons, targets included improving clinic flow/templates, fixing problems with prior authorizations, and improving communication. The methods used in this study successfully identified system stressors specific to each group that can serve to inform improvement efforts to mitigate burnout.

The 85% burnout rate was higher than reported in previous studies looking at PRS professionals (29%–37%),[14–18] and higher than reported in more recent non-PRS studies (physicians, 56%–63%;[6,19] nurses, 57%–60%;[19] staff, 46%[4]). Shanafelt et al[6] reported an increase in physician burnout from 38.2% in 2020 to 62.8% in 2021. The high burnout rate recorded here is in keeping with the sharp increase observed by Shanafelt et al.[6] This study provides the first estimate of the burnout rate in PRS using a validated instrument post-COVID-19 pandemic. Further studies are needed to assess future trends, such as whether burnout rates decline or continue to rise postpandemic. For example, while using self-reported and nonvalidated measures of burnout, there are some indications that burnout rates post-COVID-19 pandemic might be decreasing in PRS.[27,28]

Prevention and mitigation of burnout in PRS have traditionally been seen as the responsibility of individuals.[15] Organizations have supported individuals in this endeavor with wellness programs that provide self-assessments, advice, and mental health support.[20,21,29,30] However, as burnout is a contextual, systemic problem,[22] organizations are recognizing the need to implement systemic changes that address workplace stressors that contribute to burnout.[29–33]

We used a unique systems approach to evaluate workplace stressors in a PRS division, including surgeons and nonsurgeons, at a large US academic medical center. Figure 1 illustrates how these methods were effective in

identifying high-priority stressors, derived from the NAM model,[22] that can be targets for improvement efforts. High-severity and high-priority stressors were identified in the first phase and subsequent phases increased specificity and understanding of the unique stressors affecting the division. For example, our understanding of "inadequate staffing" became more specific through the course of the study to incorporate being short-staffed, needing specialist staff, and needing to retain good staff.

Total participation rates varied between phases but remained high throughout the study (93% for survey, focus groups, and validation and prioritization; 64% for CIs; and 57% for the impact-effort survey). This high participation rate is likely attributable to the small size of the division (n = 14), a high level of support from divisional and departmental leadership, and the study design that enabled in-depth analysis that was contextually relevant and engaging to participants. CI participation by staff of 25% contributed to the low total CI participation. This was attributable to staff working from home, making observation impractical. Low participation in the impact-effort survey may be attributable to study fatigue. This could be attributable to fatigue due to the 8-week long, multiphase process.

LIMITATIONS

The study was conducted within 1 division of a US academic medical center. This allowed for the stressors within that division to be comprehensively and exhaustively explored. However, the stressors identified are relevant only within the contexts of this study and cannot be generalized without a larger sample size from multiple institutions with a wider range of contexts and roles. A similar systems approach can be used in other contexts to rapidly measure burnout rates and identify stressors as targets for improvement. In addition, it is possible that aggregated data across multiple similar studies in other divisions, or in other PRS contexts at other institutions, could be useful to investigate demographic trends or to identify common stressors across multiple contexts. Goodacre et al[34] and Kwong et al[35] have described challenges and recommendations for researchers employing these methods.

The study occurred during the COVID-19 pandemic, which likely contributed to high EE and high burnout (85%). In addition, the highest impact interventions (Table 2) recognized the need for hiring new staff, retention of existing staff, and alleviating workload. Contextual stressors that may have contributed to this were increased surgical loads to address the backlog from the suspension of elective and nonurgent cases during the pandemic and recent personnel losses.

Participation was 57% for the impact-effort survey. The study process was long, covering multiple phases over approximately 8 weeks. It is likely that interest and engagement waned due to the time length of the study. Future studies should consider how to sustain participant interest throughout or consider how the participant time commitment can be reduced.

Another limitation is that the 2-item MBI has only 1 question each for the EE and DP scales.[26] Although useful as a simple measure of burnout, it does not capture nuances of burnout characteristics that the full 22-item MBI survey might have done. A recent study by our team utilized both the full MBI and NAM work-system factors, but this resulted in a very long survey with some redundancies.[24] By using 21 workplace stressor items based on the NAM work-system factors and the MBI, the survey was shortened, and such redundancies were avoided.

The study did not try to measure the extent to which agreement within or between groups was influenced by division members discussing their concerns among themselves, which could have resulted in some convergence of opinions. In addition, it is not known how much the presence of the data collection team may have influenced behavior and attitudes. Potential effects were mitigated by clearly explaining to CI participants at the start of each session that they would be shadowed unobtrusively and that they should go about their tasks as they normally would so that we could best capture their day-to-day stressors.

CONCLUSIONS

We worked with a PRS division at a large US academic medical center using systems analysis and contextual design methods to establish an 85% burnout rate and to identify targets for improvement for surgeons, such as improving respect and recognition, making departmental grand rounds optional, and providing more protected time, and for nonsurgeons, such as improving clinic flow/templates, fixing problems with prior authorizations, and improving communication. Future work will implement and assess improvement efforts based on the priorities identified here. Other organizations can deploy this systems approach with contextual design methods to rapidly identify high-impact/low-effort targets for improvement initiatives.

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DISCLOSURES

Dr. Greenberg serves as President of the Academy for Surgical Coaching. Dr. Mazur is an equity stakeholder in Community, LLC and founder of Maiazura, LLC. The other authors have no financial interest to declare in relation to the content of this article. This study was funded by the UNC Health Well-Being Program.

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