A Model of Disruptive Surgeon Behavior in the Perioperative Environment

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BACKGROUND: Surgeons are the physicians with the highest rates of documented disruptive behavior. We hypothesized that a unified conceptual model of disruptive surgeon behavior could be developed based on specific individual and system factors in the perioperative environment.

STUDY DESIGN: Semi-structured interviews were conducted with 19 operating room staff of diverse occupations at a single institution. Interviews were analyzed using grounded theory methods.

RESULTS: Participants described episodes of disruptive surgeon behavior, personality traits of perpetrators, environmental conditions of power, and situations when disruptive behavior was demonstrated. Verbal hostility and throwing or hitting objects were the most commonly described disruptive behaviors. Participants indicated that surgical training attracts and creates individuals with particular personality traits, including a sense of shame. Interviewees stated this behavior is tolerated because surgeons have unchecked power, have strong money-making capabilities for the institution, and tend to direct disruptive behavior toward the least powerful employees. The most frequent situational stressors were when something went wrong during an operation and working with unfamiliar team members. Each factor group (ie, situational stressors, cultural conditions, and personality factors) was viewed as being necessary, but none of them alone were sufficient to catalyze disruptive behavior events.

CONCLUSIONS: Disruptive physician behavior has strong implications for the work environment and patient safety. This model can be used by hospitals to better conceptualize conditions that facilitate disruptive surgeon behavior and to establish programs to mitigate conduct that threatens patient safety and employee satisfaction. (J Am Coll Surg 2014;219:390−398. © 2014 by the American College of Surgeons)

Disruptive conduct by physicians is increasingly cited as a problem in health care systems. The American Medical Association has defined disruptive physician behavior as "Conduct, whether verbal or physical, that negatively affects or that potentially may negatively affect patient care disruptive behavior. (This includes but is not limited to conduct that interferes with one's ability to work with other members of the health care team)."[1]

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Disruptive behavior can be overtly intimidating, such as inappropriate anger or threats, or passive conduct, such as avoiding assignments or demonstrating an uncooperative attitude toward work tasks. This behavior can be intentional or might occur with lack of awareness of its effects. Health care professionals in positions of power often exhibit these behaviors, and surgeons in particular have been documented as frequent offenders by both coworkers and patients.[2,3] The downstream effects of disruptive and intimidating physician behaviors are protean, and include decreased patient satisfaction, increased risk of patient harm, increased rates of staff attrition, and increased rates of litigation.

Although surgeons are most commonly identified as the perpetrators of disruptive behavior in the health care environment, no study has described the different modalities of disruptive behaviors that are commonly exhibited. In addition, no unifying model provides a framework for the occurrence of disruptive behaviors by surgeons. We hypothesized that semi-structured interviews and grounded theory analysis would generate a

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robust description of disruptive surgeon behavior, including catalysts for this behavior.

METHODS

The research design selected for this qualitative project followed a grounded theory methodological approach.[4-6] As defined by Strauss, this theory stresses extensive use of interviews in conducting research, highlighting the need for data immersion by the researcher to understand processes.[5] The aim of grounded theory methods was to produce innovative theory that is "grounded" in data collected from participants on the basis of the complexities of their lived experiences in a social context. The goal of this research project was to generate theory about the types and causes of disruptive surgeon behavior in the perioperative environment from the collected data. Use of the grounded theory process allowed us to explain how those that work in the operating room perceive disruptive surgeon behavior.

Participants

After receiving IRB approval, the study's participants were recruited at a single academic hospital setting through email requests for participants for a study on disruptive behavior by surgeons in the operating room. The final number of participants was determined by data saturation, and maximum variation of interviewees was sought to gather a wide range of experiences. Maximum variation was accomplished in the study by selecting participants from among those who responded to email to gather data from participants from a wide range of experiences. Participants were sought until information gathered from interviews no longer deepened or contradicted previous data.[4] Participants were purposively sampled with an eye to achieving maximum variation with respect to age, sex, and occupation to increase the likelihood that the findings would incorporate different perspectives.[7]

Data acquisition

A single interviewer with no personal or professional ties to the interviewees conducted all of the semi-structured interviews confidentially (WBE). Two broad questions addressing interviewees' experiences with disruptive surgeons and the meaning they made of those experiences guided the individual interviews. The first question was, "Can you tell me about a time when you saw a surgeon demonstrate disruptive behavior?" The participants spent 10 to 20 minutes responding to this question. The second question, which took 30 to 40 minutes to discuss, was, "Please explain why you believe the surgeon behaved in this way." More specific auxiliary questions focused participants' answers on particular concerns raised in the context of interviewee responses. The interviews were audiorecorded and transcribed. After the interview, each participant had the opportunity to review and approve his or her transcript for accuracy as a way to perform "member checking;" that is, to achieve trustworthiness and ensure that the data honored the meaning as conceived by the participants.[8,9] Both investigators had access to and reviewed all interview transcripts.

Study participants chose their own pseudonyms. The investigators removed education, religious affiliation, vocation, marital status, and names of any institution from transcripts to protect the confidentiality of participants. After the interview, each participant had the opportunity to review and approve his or her transcript for accuracy of content. This allowed them to confirm that any identifying information was removed, as well as to allow them to add, remove, or modify any portion of the transcript.

Throughout data collection, the investigators recorded impressions and ideas in journals. These notes were analyzed as well. Therefore, multiple sources provided confirmation of data, enhancing the study's rigor.[10]

Data analysis

Grounded theory methodology is based on the process of analyzing the narratives of interviewees, then developing codes, categories, and themes that are grounded in their descriptions, and, finally, generating hypotheses about how these themes interplay.[4,10] Throughout the study, the authors maintained self-reflective journals, as well as analytic and theoretical memos according to the principles of grounded theory design.[6,11-13] This procedure created documentation of observations during data collection, including how data were organized into categories, connections made between pieces of data, processes that developed, and identification of various themes expressed by the participants. The two authors met regularly to analyze data, including providing feedback, challenging one another's data analysis, adding to emerging thoughts, consulting for ongoing feedback on codes and emerging themes, and bringing to light one another's own subjectivities as researchers. The credibility of this qualitative study was achieved through a triangulation of data sources, including participant checking, peer debriefing, and audit trails.[14]

In accordance with grounded theory analysis, data were analyzed using open, axial, and selective coding.[6] First, in open coding, the data were organized into pieces of meaning formed by phrases, sentences, or paragraphs in which the participants expressed their experiences. These verbal elements were then organized into theme-based categories. Second, in axial coding, these categories were compared to determine inter-relationships.[15] The categories were continually revised as new data were obtained

and analysis became more complex (eg, categories were redefined to include various subcategories). The categories evolved, eventually forming a theory of participants' experiences.[15] Finally, in selective coding, an overarching theory was determined, based on a core category that subsumed all others, and on the relationships between different participants' experiences.[6,15] The result was a 4-component model of these experiences.

RESULTS

All 19 participants worked in the perioperative environment of the same academic medical center at the time of their interview in 2012. In terms of occupation, 5 participants were medical students, 4 were anesthesiology faculty members, 4 were general surgery residents, 4 were perioperative nurses, and 2 were scrub technicians. Demographics of participants are documented in Table 1.

The following 4 themes about the disruptive behavior of surgeons were indicated through data analysis, participant checking, peer debriefing, and examination of the audit trail: categories of disruptive behavior, situational stressors, cultural conditions, and personality traits.

Categories of disruptive behavior

Participants observed a range of behaviors that were disruptive to the surgical environment, the most common of which was verbal hostility (see Table 2). Fifteen interviewees reported instances in which they witnessed a surgeon demonstrate verbal hostility by "yelling," "swearing," making "offensive comments," "blaming" others for difficulties, "threatening," or making "disparaging remarks" about others' capacities. Interviewees described the aim of this hostility was to berate, intimidate, cause a feeling of deficiency, or evoke a sense of shame. For example, 3 interviewees described being told, "You're killing the patient!" and 3 mentioned instances when surgeons had said to them, "You're an idiot!" Interviewees reported that these verbal outbursts and comments created anxiety and discomfort in the operating environment, as well as fear of escalated behavior.

Physical tantrums, manifested by throwing of objects or hitting or kicking walls or equipment (eg, buckets, tray stands, etc), were another common form of disruptive behavior and reported by 12 participants. Throwing was typically preceded by yelling, with subsequent throwing of a nearby object or an object already in the surgeon's hands. For example, interviewees recounted instances when frustrated surgeons threw cell phones, pagers, scalpels, or medical supplies into the air, toward the wall, or on the floor. Participants also described instances when these objects veered or bounced and inadvertently hit others in the room. Respondents perceived tantrum throwing as resulting in more errors in a surgical procedure and escalating demonstrations of anger. In the most grievous reports, 7 participants described cases of physical assault, including being pushed, grabbed, jabbed, hit, or having objects thrown directly at them. These descriptions involved being yelled at when being grabbed by the arm, or yelled at and then hit on the back or side.

Nine interviewees described situations in which their concern for patient safety directly conflicted with the desire of the surgeon to efficiently complete the case. This included times when staff was concerned the patient was at a high risk for morbidity and/or harm, when there was doubt as to whether the case should proceed as planned, or when taking precautions that the surgeons believed were unjustified. Interviewees reported being in a difficult position when they wanted to stand up for the patient in the face of opposition from the surgeon who was preoccupied with time pressures. For example, all anesthesiologists reported being pressured to administer more anesthetic than was safe or necessary during moments when surgeons attributed difficulties to a need for additional sedation. Participants also described occasions when surgeons insisted that multiple cases could be done simultaneously and that they, therefore, should have access to more than one operating room and team.

Another form of disruptive behavior was refusal to work with unfamiliar staff or with staff in training. Seven interviewees reported that surgeons demanded to work with the same staff each day, and when new staff was assigned to the operating room, surgeons would berate them, resist their help, or stop the surgery. Interviewees indicated that they believed that working with established staff allowed for greater familiarity, expediency of communication, and avoided the additional effort of training by the surgeons.

Table 1. Interviewee Demographics

Demographics	
Age, y, median (IQR)	33 (28–44)
Sex, n	
Male	9
Female	9
Race, n	
White	13
Asian American	4
Hispanic	1
African American	1
Highest level of education, n	
Some college/associate's degree	2
Bachelor's degree	9
MD	8

IQR, interquartile range.

Table 2. Disruptive Behavior Descriptions

Variants	Representative comments
Verbal hostility	"There is a scrub, and he is Latino. This surgeon will tell him derogatory things. Like, "What? Did you just cross the river? Is your green card still fresh?" "I can't understand what they heck you're saying. Are you like, one of those brown people?" And he'll use cuss words. "
Physical tantrum	"He was very angry, yelling at her [the nurse] across the desk, and then he came around the desk and actually pinned her up against the wall and had his hand on her throat while saying, "You can't take my room away." People pulled him off."
Threat to patient safety	"So we run out, we meet the patient, we get the IV started, we come into the room, I am pushing the propofol, putting the patient to sleep, and there's a whack between my shoulder blades, which, by the way, when I'm giving a drug is probably not a good thing to do."
Refusal to work with new/different team members	"If … I'm not in his room, he goes to my coordinator and yells at her about why I'm not in his room. And so there's nothing I can really do. It makes me mad …. Just being in his room is hard."

Situational stressors fostering disruptive behavior

Interviewees provided several factors that are consistent with situational stressors (Table 3). Inappropriate conduct by surgeons most often occurred when an unexpected complication arose during surgery. Ten interviewees explained that during these unpredictable moments, surgeons might believe they are not in control, and the risk of patient morbidity and mortality escalates. They might also perceive additional stress because they believe they are acting alone to find a solution and will ultimately be blamed should the situation escalate or not resolve. Disruptive behavior can result from a surgeon believing that, despite best efforts, there is nothing he or she can do to prevent patient deterioration.

Working with unfamiliar staff was also mentioned frequently as a source of frustration for surgeons. Eight participants mentioned that disruptive surgeons were known to escalate their behavior when working with staff that were not his or her normal operating room team. Interviewees explained that the technical difficulty of surgery is ameliorated by the routine of having expectations for the rhythm of a procedure. Familiarity of staff with a surgeon's patterns allows them to anticipate steps in a procedure and the instruments that are required at a given moment. When this rhythm is disrupted, the frustration can build during the course of a case until a disruptive incident occurs.

The third most-often mentioned situational stressor for disruptive behavior was the dual responsibility of training learners and providing the best care for a patient. This challenge applied to the training of surgical residents and medical students, as well as to trainees in the other perioperative disciplines. Five interviewees said that teaching when performing surgery is demanding because of the risk that the trainee might make a mistake that results in major complications. Interviewees explained that watching someone struggle with a complicated maneuver that you can perform yourself with proficiency can be frustrating and can lead to outbursts. In addition, the inclusion of a circulating nurse trainee or scrub student can disrupt a surgeon's normal expectations and result in a struggle about appropriate levels of autonomy for these individuals as they learn how to perform their job.

Cultural conditions fostering a tolerant environment

The power dynamics of the hospital environment that privileged surgeons and allowed them to behave

Table 3. Situational Stressors

Factors	Representative comments
Complications during surgery	"It's high stress anyway, and then the slightest thing [complication] takes it to super high stress. But if we make mistakes, people really die. You basically have nobody to blame but yourself at the end if somebody's hurt by what you're doing. And that's a huge burden to bear."
Working with unfamiliar staff	"I work with this one surgeon. He's very difficult. I'm definitely his security blanket. As long as I'm in the room … there are some times when I can mess up or not have an instrument fast enough or whatever and he never really gets mad at me, but he will get mad at everyone else in the room. So when I have students in there, he gets very defensive. He will tell them that they're no good, that they'll never be as good as me. "
Responsibilities associated with training	"The way you teach someone … is you allow them to operate … but you still are putting a resident in a position where they can hurt your patient … so there's a fairly low threshold to tolerate … errors."

disruptively generated an additional theme (Table 4). The most often mentioned reason given for the tolerance of difficult behavior was the considerable amount of money surgeons earned for the institution. Eleven participants explained that surgeons were viewed as consumers of the hospital resources and that staff was responsible to provide the services necessary to keep surgeons satisfied, even if it meant tolerating disruptive behavior. One interviewee explained that behavior of disruptive surgeons deteriorates during the course of their careers from less severe (eg, yelling, threatening, blaming) to major disturbances (eg, throwing objects, physical contact, leaving the room), for which they incur no negative repercussions from the institution because of their money-making capacity. Participants also explained that the more money a surgical specialty made, the more disruptive behavior was tolerated; neurosurgeons and cardiac surgeons were most frequently described in these discussions.

Ten participants reported that surgeons demonstrated disruptive behavior most frequently and most intensely toward those with the least amounts of power in the hierarchical structure of the perioperative environment, particularly nurses and surgical scrub technicians. These participants agreed that surgical technicians were especially vulnerable because their position obligates them to attend to the surgeon's needs, because they were on the bottom of the power hierarchy, and because they tended to work with the same staff in the same setting.

Those in positions of less power were frequently women and staff of color. Eight participants reported that men were favored in the operating room by both male and female surgeons. Attractive women were less frequently seen as the victims of disruptive behavior, regardless of their level of skill or vocation, and several interviewees reported male doctors preferred to work with attractive female staff. Female participants described being called derogatory names, being hit, and witnessing physical violence perpetrated by male surgeons toward female staff. Five interviewees reported they had witnessed racial discrimination perpetrated by white male surgeons toward staff of color. Most commonly reported were incidents when surgeons had made comments to staff, including telling people to return to their country of origin, asking them about their residency status, or telling them that their surgical skills were deficient because of their ethnic background. For example, one participant of color reported being told, "Maybe it's because you're black that you can't [do this] right."

Nine participants explained that the surgeon is traditionally in a position of near-absolute power in the operating room; the surgeon orchestrates all activities and no one checks his or her power or reprimands them when they misbehave. Participants reported they had witnessed more frequent disruptive behavior in academic hospitals than in private institutions and within American hospitals more frequently than in hospitals in other countries where they had worked. This was attributed to the fact that in the study institution's academic setting, surgeons are employed by the medical school rather than the hospital and have fewer potential consequences from the hospital for disruptive behavior. Participants also reported their belief that disruptive behavior is more common in states where nurses are not unionized because with union support a nurse might be more likely to pursue an issue of disruptive behavior by a surgeon.

Personality factors of those who most commonly behave disruptively

Those who behave in a disruptive manner manifested common personality factors (Table 5). Sixteen interviewees reported that some surgeons were consistently disruptive and acknowledged that others were consistently kind and professional in their interactions. Surgeons who frequently perpetrated disruptive behavior had an interpersonal pattern of intimidating and demeaning behavior that became particularly prominent in stressful situations. It was these surgeons of a particularly abrasive personality style, described as "compulsive," "arrogant," "detached," "emotionless," and "self-interested," who were seen as being the most apt to be triggered by situational stressors and to take advantage of the power they hold in hospitals.

Surgery training was viewed as attracting this type of disruptive personality. Twelve interviewees explained that because the training process is intensive and marked

Table 4. Cultural Conditions

Factors	Representative comments
Surgeons make money for the hospital	"The institution gives them the signal, 'You know what, you bring a lot of money to the institution, and you can do whatever you like.' And so they do …. The institution turns its head because to fire a surgeon … you're probably talking tens of millions of dollars."
Exhibition of power vs least powerful	"The further you go down in the power structure, the less inhibited the disruptive behavior by surgeons. They think of those people as expendable and invisible."
Unchecked surgeon power	"The more disruptive the surgeon was … the more they got. If they whined and complained and made a fuss, they had the power and they would get rewarded."

Table 5. Personality Factors

Factors	Representative comments
Maladaptive personalities attracted to surgical training and careers	"This behavior is more common in surgery than in some other specialties. If you have a difficult personality, if you're a contentious person, you're not going to go into something where one of the markers of success is high emotional intelligence. Those dysfunctional personalities … are more likely to go into something where they don't have to have one-on-one contact."
Maladaptive behaviors fostered by surgical training	"The training … is high stress … no one gives you good coping skills. You're very rarely praised for doing a good job, but you're always criticized for doing a poor job. You're trying to hold it in and not react to your attending."
Internalized sense of shame/failure to "measure up"	"When things start going wrong you feel that inadequacy and you think, "My God …. Maybe I'm not good enough to do this." And I think that's very scary … that maybe you're not competent enough to do it."

by constant stress and criticism, those more likely to succeed in surgical training were seen as perfectionistic, self-assured people who were unperturbed by the lack of positive reinforcement and thrived in the face of constant challenge. Surgery training was thought to attract individuals who aspired to high-powered careers and unquestioned authority in a situation that required little empathy or emotional connection with patients. Interviewees made the distinction that it was not necessary to have this type of personality to be proficient at technical surgical skills; however, it was beneficial to have this personality type to succeed in surgical training and to "fit in" with surgical culture. Although some medical student interviewees stated that they were initially drawn to surgery, they ultimately decided not to enter into the field because they did not want to become like the personalities they perceived were a result of surgical training.

These same participants explained that this difficult style of interacting was reinforced during surgery training, which was seen as a process that made trainees feel worthless to make them malleable, responsive to the favor of the instructor, and dependent on the instructor's ideas rather than their own intuition. In the course of an ongoing sense of inadequacy and failure, social isolation, and lack of social support, a trainee became accustomed to a style of learning characterized by intense criticism and hostility. Because this was the interpersonal style by which they were trained, surgeons were seen as recreating the same intimidation, verbal abuse, and shaming to teach others.

Nine interviewees believed that surgeons who were especially disruptive are those with an internalized sense of shame or self-doubt as a result of interpersonal trauma during their lives or because the training and socialization into the surgery profession was traumatic. These surgeons were especially volatile because they were struggling with their own insecurities and fear that mistakes or complications indicated that they were poor clinicians. They reacted to mistakes or complications with blame for others and anger because of their desire to externalize self-doubt. Other participants pointed out that surgeons often acted angrily because they worried about being thought of as possessing deficient skills and did not handle complications well in part because of a fear that poor outcomes would confirm their fears of inadequacy.

Grounded theory model

Figure 1 shows the model of disruptive behavior of surgeons that emerged from thematic analysis. The figure illustrates the interactions among the themes described by the interviewees. One interviewee suggested this model when asked to describe why disruptive behavior occurs: "I think it's a combination of someone's underlying personality traits, a culture that tolerates that type of behavior, and specific situational stressors."

DISCUSSION

Disruptive behaviors occur across the spectrum of health care disciplines.[16,17] However, when asked which specialties were more inclined to display disruptive and intimidating behavior, the most frequent response to one survey was general surgery.[2] The culture of Departments of Surgery might be most accustomed to an overall acceptance in health care of intimidating and disruptive behaviors.[18] Previous studies have highlighted a number

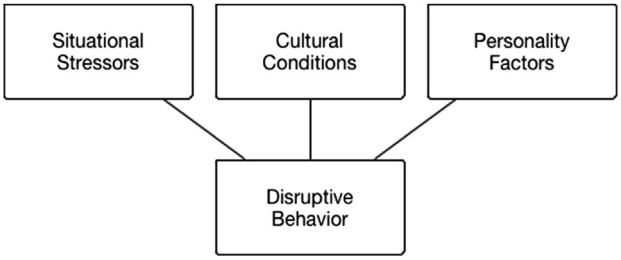

Figure 1. Model of disruptive surgeon behavior.

of stressors surgeons face, namely, pressure from productivity demands, costs, and the threat of litigation, a hierarchical system that privileges physicians because of their clinical role, and the strain of very emotional situations.[2,19] Although disruptive behaviors have been tolerated historically for all of these reasons, this acquiescence is no longer acceptable in light of recent evidence of the complex impact on the greater health care system of disruptive physician behavior. Disruptive behaviors have been found to result in harm to patients, poor patient satisfaction, increased cost of care, and loss of staff.[16,20,21] For colleagues of intimidating physicians, disruptive events increase stress, frustration, loss of concentration, and are damaging to teamwork and communication.[2]

This study provides the first qualitative description of disruptive surgeon behavior in the perioperative environment. Grounded theory analysis was used to generate descriptions of the spectrum of disruptive surgeon behaviors using the meaning ascribed by those most affected by the behaviors. Expounding specifically on incidents described by interviewees allowed us to delineate perceived characteristics and conditions that enable disruptive behaviors by surgeons in the operating room. The profound impact that experiences, cultural factors, and determination of why surgeons behave as they do emphasizes the need for descriptions that use the words of those who work in these environments and who have experienced these effects. With this approach, the conceptualization of disruptive behavior emerged entirely from interviewees' input. This methodology allows the meaning participants have made of their experiences to be elicited without the use of preconceived constructs to interpret the data.[4,6,11]

Participants explained that aggressive personalities were historically drawn to surgery, where a disruptive interpersonal pattern might be reinforced in training through a culture of shame. Medical students described a reticence to pursue a career in surgery precisely because of concerns about this sort of culture being prevalent and expressed a desire to not become a disruptive physician. Many interviewees believed that hospitals tolerated surgeons' intimidation of staff because their services were lucrative for the institution. In short, despite increasing attention to disruptive physician behavior and external mandates that it be addressed, those who are subject to this behavior projected an air of pessimism that change will occur.

Previous studies of safety culture have described disparities of opinion about the cause of tension in the operating room and have therefore provided diverse solutions. Communication failures in the operating room are a key source of interpersonal tension, and these communication failures relate directly to the concept of the "inciting event" described by our interviewees.[22] Evaluation of teamwork in the operating room using both quantitative and qualitative methods has demonstrated that the quality of collaboration and communication is perceived very differently by surgeons and other team members.[23,24] Those incongruent perspectives provide a critical nidus for communication failures.

Negative emotions generated as responses to and consequences of conflict are destructive in development of a cohesive group identity.[25,26] The myriad perspectives on sources of tension in the operating room and the importance of shared group purpose in high-reliability teams highlights the importance of interprofessional education activities, particularly for novices who are learning to navigate this complex culture.[24,27] These same interprofessional training exercises might also serve as reflective opportunities for more established staff, resulting in improved group dynamics and cohesiveness.

Participants described verbal hostility as a common form of disruptive behavior. Control of emotions is central to preventing escalation of potential inciting events in the perioperative environment; misattribution and harsh language, both behaviors described by interviewees in this study, commonly result in transformation of task conflict to relational conflict.[25,26] Although verbal hostility is likely a result of both learned and intrinsic personality traits, conflict management training can mitigate this factor.[25,28] Recent work by Sanfey and colleagues, identified the need for early identification of problem residents and remediation of their undesirable behaviors using a program based on the highly successful model of Vanderbilt's Center for Patient and Professional Advocacy.[29] Our findings would support similar proposals for a reporting and remediation system for faculty as well, recognizing that altering deeply ingrained, long-held behaviors can present a more extensive challenge.

Our study is not without limitations. First and foremost, all participants worked in the perioperative setting at a single institution. Although some of them had experiences at other institutions and in other clinical settings, this did not apply to all. Therefore, some findings might be unique to the institutional environment, highlighting the importance of attempting to replicate these findings. An additional shortcoming was our ability to recruit surgical scrub technicians to participate in the interview process. Although multiple attempts were made to invite individuals in this role to participate, we simply were not successful in completing an interview with more than two. One of the clear themes from the completed interviews with scrub technicians was the impact of the power differential between the scrub technician and the surgeon, as well as potential apprehension surrounding

being identified as a study participant, despite our efforts to maintain confidentiality. The authors attribute the inability to recruit scrub technicians to the study to a sense of disempowerment expressed by the two who were successfully interviewed. This also highlights the limitation of selection bias because participants sought the opportunity for their interviews after receiving a recruitment email; those who chose to participate might be individuals who had a particular interest in or specific experiences with disruptive surgeon behavior.

As with any research design, limitations are also inherent in qualitative methods. These limitations include the ability to generalize findings, variations in interpretation of the data, and the interpretative power of the data.[14] It will be important over time to replicate the findings of this research, including the use of quantitative approaches that would do justice to the complexity of disruptive behavior. Mixed methods could be used to facilitate an improved understanding and generate new theory about disruptive physician behaviors and causes.

Credibility in a qualitative study is established through triangulation of data sources.[14] In this study, techniques for triangulation included:

1. Participant checking: This was done through sending the transcripts to participants to verify their words and allowing them to modify any of their interview materials.
2. Peer debriefing: In the case of this research, the investigators met regularly as a peer research team, challenging one another's data analysis, adding to emerging thoughts, raising insight into factors not previously considered, and bringing to light subjectivities as researchers. The emerging analysis was iteratively revisited for ongoing feedback on codes and emerging themes, as well as the final conceptual model.
3. Audit trails: This included notes generated during data analysis, writing down which participants mentioned each theme, documenting which themes were ultimately not included, and categorization of quotes into concept families. This complex process provides verification of the integrity of the analytical process.

The model generated from this study has a variety of potential applications in an environment seeking to address disruptive surgeon behaviors. Although situational stressors are subject to considerable individual variability, they can be addressed at both the system and the individual level. Team member training has been identified by surgeons as a key method for improving patient safety, and would likely contribute to increased stability of operating room teams, creation of shared mental models, and increased individual investment in overall team function.[23,30] Redress of inciting events at an individual level dovetails with need for addressing personality factors and speaks again to the relevance of conflict-management training for surgeons and those who work in the operative environment. As previously described by Rogers and colleagues, conflict-management training for surgeons would ideally foster acquisition of effective behaviors and enhance understanding of ineffective behaviors.[25,28] Finally, buy-in for correction of cultural conditions that permit disruptive surgeon behavior must come from the top; although cultural transformation can initiate at any level, ultimately hospital and medical center leadership will have to accept responsibility for creation of a safe learning environment that includes a reporting system predicated on a clear code of conduct.[31] At the authors' institution, a new program was implemented in the 2013 to 2014 academic year that meets the criteria described by Leape and colleagues[31] as a response to The Joint Commission; the impact of this program will be evaluated as maturation occurs but represents a resource for culture change that has been received enthusiastically by staff and students.[32]

Although disruptive behavior in health care organizations is not rare and most health care providers have experienced or witnessed disruptive behavior, 40% of clinicians do not report the intimidator or the behavior.[18,33-35] However, a culture of safety is "dependent on teamwork, positive interactions, and collaboration."[25] Health care organizations are now required to have programs in place to protect workplace culture and to promote safety for the health care team and patients. Tolerating disruptive behavior might appear to be endorsed by not taking complaints seriously, which can compromise staff morale and patient care.[26] However, the single most malleable factor in the model generated by our interviews was the presence of a culture that tolerates disruptive behaviors; by simply altering this one area, a major change in traditional surgical culture could happen quickly. If, however, we continue to turn a blind eye to tantrums, threats, and intimidation, and the factors that underlie those behaviors, little can or will change.

Author Contributions

Study conception and design: Cochran, Elder
Acquisition of data: Elder
Analysis and interpretation of data: Cochran, Elder
Drafting of manuscript: Cochran, Elder
Critical revision: Elder

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