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BIAS IN THE TRAUMA BAY: A MULTICENTER QUALITATIVE STUDY ON TEAM COMMUNICATION

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Abstract

Background: Team communication and bias in and out of the operating room has been shown to impact patient outcomes. Limited data exist regarding the impact of communication bias during trauma resuscitation and multidisciplinary team performance on patient outcomes. We sought to characterize bias in communication among healthcare clinicians during trauma resuscitations.

Methods: Participation from multidisciplinary trauma team members (emergency medicine and surgery faculty, residents, nurses, medical students, EMS personnel) was solicited from verified level 1 trauma centers. Comprehensive, semi-structured interviews were conducted and recorded for analysis; sample size was determined by saturation. Interviews were led by a team of doctorate communications experts. Central themes regarding bias were identified using Leximancer analytic software.

Results: Interviews with 40 team members (54% female, 82% white) from 5 geographically diverse Level 1 trauma centers were conducted. Over 14,000 words were analyzed. Statements regarding bias were analyzed and revealed consensus that multiple forms of communication bias are present in the trauma bay. The presence of bias is primarily related to gender, but was also influenced by race, experience, and occasionally the leader's age, weight, and height. The most commonly described targets of bias were females and non-white providers unfamiliar to the rest of the trauma team. Most common sources of bias were white male surgeons, female nurses, and non-hospital staff. Participants perceived bias being unconscious but affecting patient care.

Conclusions: Bias in the trauma bay is a barrier to effective team communication. Identification of common targets and sources of biases may lead to more effective communication and workflow in the trauma bay.

Level of Evidence: 4; Prognostic/Epidemiological

Key Words: bias, communication, trauma, team

BACKGROUND

Implicit bias and team communication are increasingly important topics in healthcare research. Prior investigations have revealed mixed results with respect to the impact that provider bias may have on patient outcomes(1). However, negative implications of provider bias on patient interactions, including in the trauma bay, have been established(2), and bias has been shown to influence clinician recommendations(3). Similarly, recent work has shown that patients may also have their own biases towards providers(4). More recent research of implicit bias in healthcare has expanded to include bias experienced among healthcare professionals(5-9). The effects that bias may have on healthcare team performance require further investigation, but at a minimum bias threatens the psychological safety of team members who perceive it(10) and may result in behaviors counterproductive to high quality team performance, and impact patient outcomes(11).

Healthcare research has also turned its attention to the role that nontechnical skills play in the trauma bay and their impact on patient outcomes(12-14). Poor team communication is responsible for as much as 70%-80% of healthcare errors(15) and miscommunication resulting in fatal errors is two to four times more likely to occur among trauma teams compared to other medical teams(16). In one study of communication failures in a controlled operating room setting, 90% of communication failures were found to have negatively impacted cases by way of information delays or information loss(17).

Less is known about how team communication and bias affects perceptions and care in the high acuity of the trauma bay. In this study, we aimed to characterize recollections of bias in communication among trauma team members during trauma resuscitations. The characterization

of communication bias requires exploration of what communicative forms bias may take (i.e., nonverbal, verbal), what types of bias are most experienced (e.g., gender, age, sex, etc.), and what implications this may have on the team and the patient before hypotheses can be generates. Although our purpose was to provide a qualitative exploratory investigation into such biases, we anticipated that trauma team members participating in trauma resuscitations would experience and perceive bias. This qualitative approach was guided by the following research questions(18):

1: Do trauma team members perceive the existence of bias in trauma settings?

2: If so, what is the nature of the perceived bias and who is the target of such bias?

3: Who is typically perceived to be the source of bias?

METHODS

To answer our research questions, qualitative in-depth interviews were conducted with multidisciplinary trauma team members in the following positions: emergency medicine faculty, surgery faculty, emergency medicine residents, surgery residents, nurses, medical students, and emergency medical services (EMS) personnel. Participants from American College of Surgeons-verified Level 1 trauma centers in the Northeast, Southeast, Southwest, Midwest and Western regions of the United States were recruited. Research development, methodology, and analysis adhered to the EQUATOR guidelines offered for research transparency in qualitative research (ENTREQ and COREQ) (Supplemental Digital Content, http://links.lww.com/TA/C907) (19, 20). Institutional ethics approval was obtained from the appropriate reviewing body.

Participants

Participants were recruited for the study via a purposive sampling strategy to gain insights from healthcare professionals working in trauma resuscitation. Qualifying practitioners were solicited to engage in one-on-one interviews about their perceptions of biased communication patterns among members of the healthcare team. Inclusion criteria for the sample included any medical professionals from American College of Surgeons-verified Level 1 trauma centers with direct experience in trauma resuscitation available to engage in interviews. Exclusion criteria for the sample included professionals not directly involved in trauma resuscitation, anyone outside the U.S., and those unavailable to participate during the predetermined timeframe for interviews.

A diverse pool of potential respondents was solicited using professional contacts and recommendations. In regard to gender, 21 participants were female and 19 were male. In regard to race/ethnicity, 26 participants were white while 14 were non-white, including five blacks, two Hispanics, five Asians, one Middle-Eastern, and one participant who identified as mixed Asian and Middle-Eastern. 15 of the participants identified themselves as team leads. A wide variety of different team positions, institutions, and geographic locations were represented.

After completing a brief demographic questionnaire, follow-up contact was initiated by the research team (see "Data Collection") to schedule in-depth interviews. Pseudonyms were created for each participant to protect confidentiality. Participants were mailed a $50 gift card upon completion as compensation for their time.

Data Collection

Comprehensive, semi-structured in-depth interviews were conducted by a team of communication professionals from an R1 classified research university to obtain detailed viewpoints from experienced healthcare professionals(21, 22). The communications team was comprised of three communications experts with prior in-depth interviewing experience. The team included one Caucasian male and two Caucasian females, none of which had prior relationships with interviewees. Participants provided consent to be interviewed, and virtual conferencing software was used to capture interview video and generate transcripts. Interviews were conducted from December 2021 to June 2022. After initial examination of the demographic distribution of the participants, the team decided to conduct additional interviews to ensure the perspectives of underrepresented minorities were adequately represented, yielding a final sample of 40 participants. Interviews continued as an iterative process until thematic saturation occurred, meaning no new concepts or patterns emerged. Interviews were guided by topics relating to bias; specifically, the interviewers probed bias related to gender, age, ethnicity, position, and seniority while allowing for additional factors to surface during discussion. The specific question posed was, "Do you feel that biases- whether based on gender, age, ethnicity, position, seniority, or some other factor- influence the way that members of the trauma team communicate and interact with one another?" The prompts were offered as a tool to combat recall bias and help elicit relevant memories(23).

Data Analysis

Data analysis was led by the communications team. An inductive approach, which allowed observed evidence to guide evaluations, was used to conduct the qualitative analysis. This allowed themes to emerge organically during the process. Each interviewer independently assessed the transcripts for the entire sample and engaged in numerous discussions to determine the persistent themes and direction for analyses.

In addition to the thematic analysis, text from interview transcripts were then coded using Leximancer semantic network analysis software (Release 4.5 Leximancer Pty Ltd.; 2021) which has previously been used in healthcare contexts to identify themes in patient discussion(24, 25). The software algorithm extracts key lexical patterns and concepts from textual data to visually represent themes based on contextual similarity**.** The visual data map is then manually adjusted for desired granularity in order to achieve balance in specificity and coherence(26). Recent studies have employed computer-assisted qualitative data analysis software to minimize researcher bias and allow for more objective data exploration(27). The resulting conceptual map was used to identify broad themes for deeper examination. Thematic analysis combined with computer-assisted conceptual mapping revealed significant patterns related to perceptions of bias during communication in the trauma bay.

RESULTS

Interviews took from 18 to 138 minutes to complete (mean = 48 minutes). Interview participants were from five trauma centers in different regions of the United States, (NE, SE, S, MW, and W). Of the 40 participants, 22 self-reported as female (55% of the overall population) and 18 as male. Seven of the participants self-identified as Asian, five as Black or African American, two as Hispanic or Latino, 25 as White, (62.5% of the overall population), and one as "Other." Over 30 hours of recorded video were captured along with audio transcriptions, from which 23,552 words were selected for analysis of communication bias and entered into Leximancer software. Key themes were revealed in the Leximancer concept map and quotes were identified to further explicate each item (Figure 1). The map clusters are color heat mapped from hottest to coolest, with red as the 'hottest' or most prominent and purple as the 'coolest' or least prominent(27). Concept words appear on the map in clusters (close proximity) based on identified contextual similarities. Circle sizes only indicate conceptual boundaries, not frequency of occurrence. All data units (quotes) were then analyzed by the researcher to further interpret the themes presented. The resulting concept map denotes final themes and concepts that emerge from the text. An n value is offered representing the total amount of data units present within each theme. To address the first two research questions, five persistent themes emerged in the text related to biased communication among the healthcare team in trauma resuscitation: female, biased communication, patient care, seniority, and ethnicity.

Female (n = 317)

Bias due to a team member's gender was the dominant theme appearing in the analysis (Table 1). Gender bias exhibited toward females was reported as the most frequent example of

communication bias in the trauma bay. Participants recalled a common implicit bias wherein females—regardless of their position on the trauma team—were assumed to be nurses and males were assumed to be physicians. Many participants described instances of female colleagues who were ignored or overlooked during trauma resuscitations. A few mentioned appearance characteristics such as weight or height in conjunction with gender, such that a shorter female was less likely to be viewed as a leader. The perception that men are automatically accepted as leaders while women are not was pervasive in the context of trauma resuscitation.

Participants also felt that females must engage in more proactive measures to assert their leadership roles. Participants felt this may have an impact on new personnel and influence perceptions about who is in charge. Some participants noted that females may be perceived as "bossy" when they try to overcompensate by speaking louder or more assertively.

Biased Communication (n = 217)

When prompted about general communication biases in the trauma bay, most respondents recalled some form of bias that they noticed on a regular basis, especially in high stress situations (Table 1). All but one participant perceived some form of bias, with gender and racial bias the most frequently cited. Both males and females frequently noted the presence of gender bias. In regards to racial bias, almost every non-white participant noted this form of bias. Among Caucasian participants, racial bias was infrequently mentioned, with Caucasian females mentioning racial bias somewhat more often than Caucasian males, who hardly mentioned racial bias at all.

Some respondents attributed implicit bias to a lack of clear roles in the healthcare setting, while others attributed it to behavior acquired in childhood. Interviewees did mention that they believed most of these biased communication patterns were unintentional (implicit) and could likely be overcome with a clear introduction and articulation of roles during trauma resuscitation. Some respondents expressed concern for enabling behavior or questioned whether their institution was taking responsibility for corrective action. As the interviews shifted into discussions of biased communication examples, many participants focused predominantly on misperceptions of leadership, most often related to females.

Patient Care (n = 203)

Participants frequently speculated about the inefficiency and delay in patient care that may result from biased communication. Participants believed that such delays and inefficiencies could drastically alter patient outcomes. Moreover, poor communication due to bias or conflict was believed to affect team flow and effectiveness as well as team morale and job satisfaction. Several practitioners did express their commitment to diminish or overlook distractions to expedite care and prioritize the patient—even if the distractions were due to biased behavior or communication among team members.

Seniority (n = 32)

The theme of practitioner seniority was commonly recalled by interview participants. This most often related to perceptions of experience, age, and institutional knowledge. Seniority was also important in determining the outcome of provider-to-provider cooperation as well as

discussions and decision-making regarding patient care. Some interviewees reported that individuals who appeared younger seemed to garner less professional trust and respect.

Ethnicity (n = 19)

Ethnicity also emerged as a theme when respondents discussed challenges with respect to biased communication in the trauma bay (Table 1). Similar to the biases recalled towards females, most often these biases towards ethnicity pertained to perceptions of leadership. Overall, participants felt that non-white team members were less likely to be perceived as team leader. Appearance and stature were also noted in conjunction with ethnicity such that petite non-whites were even more likely to be overlooked as leader. Many participants mentioned specific groups—including Black, Latino, and Asian ethnicities—that appear to struggle for recognition as team leads.

Sources of Bias

Further analysis of the data themes, Leximancer concept map, and interviewee demographics provided insights with respect to the final research question investigating perceived sources of bias in the trauma bay. Most frequently, biased behavior was attributed to "them," "they," "people," "colleagues," "staff," "team," and other general terms. That being said, in some cases, biased behavior was attributed to specific groups. Participants identified white male surgeons, non-trauma units (e.g., EMS), and female nurses. These groups were believed to be more likely to exhibit bias when the target of the bias was a practitioner who was new to the institution, new to the trauma team, or who was at an early stage in their career. The most frequently cited source of bias was female nurses exhibiting biased behavior toward female residents, attendings,

and team leads with whom the nurses had little prior experience. There were also some mentions of male attendings and residents behaving in a biased fashion toward female practitioners, as well as some mentions of patients behaving in a biased manner toward practitioners based on their race.

DISCUSSION

Despite existing evidence that both bias and communication may obstruct patient care, little research addresses how these phenomena together influence team performance in the trauma setting. In this study, we identified that recollections of bias are pervasive throughout the initial care of trauma patients. Respondents identified the targets of bias as "females" and "non-white providers," while the sources of bias were described as "white male surgeons," "female nurses," and "non-hospital staff." Trauma team members described bias as being unconscious (i.e., "implicit," or unintentional), albeit having an impact on patient care.

Most literature exploring the role of bias in healthcare has focused on patients as the target of bias. Haider et al. in recent years has evaluated varying members of the healthcare team and the implicit bias towards different patient populations(28). A vignette-based implicit bias test for nurses showed implicit preference for white race and upper social class patients on Implicit Association Test (IAT) assessment, but no correlation with their clinical decision making for either group. Studies on medical students and physicians have shown comparable findings. Similarly, a systematic review for physicians found these biases to be present, but with "no impact on clinical decision making" when utilizing IAT testing(29, 30).

A small but growing body of evidence demonstrates that implicit bias exists towards and among healthcare workers themselves. Gerull et al. assessed gender bias in the training evaluations of surgical residents. Comments about male trainees were more positive than those about women and included more "standout" verbiage compared to their female counterparts, suggesting an unconscious bias in these qualitative evaluations(29). Similar findings were also demonstrated in a 2016 study by Dayal et al. and most recently in a 2020 study by Brewer et al(5, 6). In contrast to these trends, Shellito et al. found that female gender was associated with significantly higher, rather than lower, faculty evaluation scores from residents in general surgery programs. The lack of overall consensus warrants further investigation on gender bias among healthcare workers(31). Patients have also been found to have implicit bias against their own surgeons, despite no evidence of reported explicit bias(4). The study at hand similarly demonstrates that bias against healthcare workers is perceived and is described by those who see it as well as experience it as a barrier to communication.

Ample amounts of research on implicit bias in healthcare (including the emergency department and trauma teams) exists and have primarily focused on provider-to-patient interactions. That research has shown that implicit bias occurs, but results are disparate as to whether bias directly impacts patient outcomes. There is, however, a direct link of poor communication and team performance on patient outcomes. In a new trend on bias and healthcare research, scholars have most recently started to examine implicit bias among healthcare teams(5-7).

Our multicenter analysis shows that practitioners perceive bias, both directly and observed, in the trauma setting and believe that it affects communication and team performance in healthcare, including inside the trauma bay. The results suggest that there is implicit bias experienced among trauma teams, that biased communication or behaviors can negatively affect communication and team performance, and that this, in turn, has the potential to negatively impact patient outcomes. Given the potential impact on patients, the findings of this study warrant further research into the effect of implicit bias on communication and team performance in the trauma bay. Future study should look to quantitative methodologies to confirm some of these perceptions on a larger scale, thus allowing for the establishment of hypotheses for testing. A nationwide survey or real-time field study would be a logical next step to parse out instances of bias with broader application.

The perceived impact on patient care highlights the need for trauma teams and their institutions to not only recognize bias, but to take actionable steps to mitigate it. In 2021, the #EAST4ALL roundtable found that the best ways to take action include "recognizing our own implicit bias, acting positively as an ally…, raising awareness of cultural competency, and ensuring institutional policies are inclusive(32)." Institutional requirements for employees to take their own implicit bias association test (http://implicit.harvard.edu) could help team members identify these unconscious thoughts that may influence communication in the trauma bay. After a foundation of identifying these biases exist, institutional education and support utilizing an Implicit Bias Toolkit, like the one provided by the National Association of Student Financial Aid Administrators (https://www.nasfaa.org/uploads/documents/Implicit_Bias_Toolkit.pdf) or the Eastern Association of the Surgery of Trauma (https://www.east.org/content/documents/2020_east4all_toolkit.pdf), would be of value.

The limitations of this study include the small number of centers involved in the interview process. While our team utilized centers from varying geographic domains to ascertain cultural and social differences that invariably exist, these are still only five trauma centers among hundreds of verified centers. Translation of results to other trauma centers may be less meaningful. The small number of individual participants could also be perceived as a limitation. Past research in qualitative methodologies assert that sample size for in-depth interviews should prioritize information quality and rigor for in-depth analysis(33, 34). Interview samples are often below 50 in order to have manageable analyses, provided there is appropriate representation and saturation from the populations of interest. Our analysis did achieve saturation and took concerted efforts to incorporate more non-white participants following saturation to better reflect the more commonly underrepresented populations in trauma care. The high percentage of individuals interviewed who identified as "White" may be a limitation that should be addressed in future studies. Recall bias is also a limitation considering the time delay for participant memories as well as the socially undesirable nature of the topic(23). Future research would benefit from real-time data collection in the field to avoid this bias. Finally, we could have more directly probed participants to identify who was the source of different types of bias; this is a question that future studies should address.

CONCLUSION

Bias in the trauma bay is perceived as a barrier to effective team communication. While prior literature shows that implicit bias between provider and patient might not have a causal relationship on patient health outcomes, this study reveals that trauma team members perceive implicit bias between providers and believe that it may affect patient care. Further work to characterize and quantify team communication patterns and biases in the trauma bay is critical.

Identification of common sources and targets of bias may lead to more effective communication, improved clinical workflow, and interventions designed to alleviate such bias. Ultimately, the measurement of these disruptions in workflow due to bias, and the ability to mitigate them, will be of value in trauma teams.

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Figure 1: Leximancer Concept Map of Themes Related to Bias in Trauma Team Communication

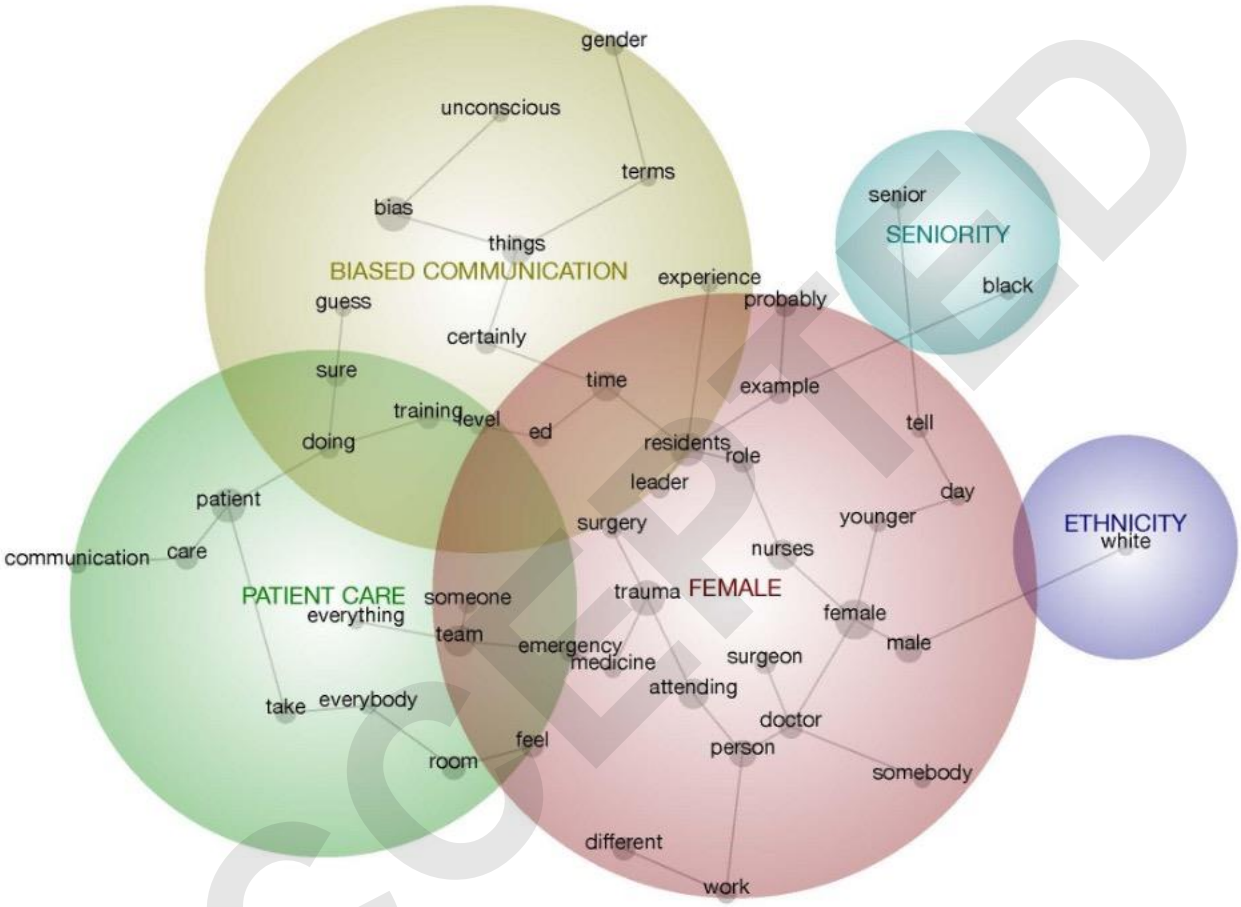


Table 1. Communication themes and relevant quotes from trauma team member interviews

Theme	Description	Supporting Quotes
Female	The most commonly reported form of bias was team member gender	*"Gender bias for sure 100% is there. Even in in 2022 we still see gender bias popping its ugly head."* *"I've seen emergency medicine residents and attendings who are female and their opinions, thoughts, and ideas are just not heard or acknowledged or thought to be wrong and then the responses from the person they're speaking to is diminishing or condescending."* *"I think it's hard practicing medicine as a female. I could say the exact same thing with the exact same tone, you know, and it would be received very differently."* *"Female surgeons…they have to be more deliberate about identifying themselves as a physician, whereas male surgeons, or even male nurses, don't have to do anything."* *"I'd say height is definitely one of the factors that should be taken into account, I mean I've had that one who was like 6 foot tall, and the nurses were going to him when they should have been going to me…it was just like automatic that the really tall guy was the more senior level person."* *"When a man steps to the foot of the bed, everybody says that's our team leader, but when the female resident steps to the foot of the bed, even if it's not explicit, I think they struggle to assume the role of leader."*
Bias	Respondents noted generalized communication bias in the trauma bay	*"Implicit bias happens because people aren't clear who's running things and not understanding roles."* *"It's mainly that unconscious bias people don't even realize they're doing it, it's kind of how it's been ingrained in us since we were children."* *"I think that in a place that changes and adjusts as quickly as our institution, people's implicit bias impacts how quickly they trust a team leader. I've seen this come down on particularly women."*
Patient Care	Respondents often commented on how biased communication	*"The added time because of this bias that enters communication and time can impact outcomes, whether it's life or death, or whether it's saving a limb, or prevention of other factors and diseases that the patient may endure."*

	may impact patient care	*"I try not to let anything affect patient care, so I will do whatever I need to do and take whatever punches I need to take to be able to make sure the patient is taken care of."*
Seniority	Bias was noted with respect to experience, age, and professional experience	*"I think you know you have two people standing next to each other, and you know who the more senior one is, your gut is going to tell you to talk to the more senior person."* *"Maybe somebody younger does the exact same thing that I do, but maybe is treated differently and maybe they think it translates to skill level, which I don't know that it necessarily does."*
Ethnicity	Biased communication was also observed in relation to a team member's ethnicity	*"If you are not white, you are less likely to be seen as team leader."* *"If English isn't your first language, or you have an accent, you're less likely to be seen as the team leader."* *"I see it amongst those who are, you know, petite, especially petite Asian, their voices won't be heard… especially if they're a surgeon."* *"I've been on teams that have been composed of all white male clinicians and that's been an issue because it seems that their input or their feedback was much more easily given or sought…I felt little on that team."* *"Black attendings are not treated with as much of an automatic respect as others and I would say are assumed to be in a lower-level position."* *"Leaders of the team who are Black, Latino, or Asian have a much more difficult time stepping into the role of leader, because the team doesn't as quickly recognize them, whereas when we have our six-foot five White man step to the foot of the bed- everybody says that's our team leader."*

Supplemental Digital Content:

ISSM CoReq Checklist: A consolidated checklist of items that should be included in qualitative research studies.

COREQ (COnsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

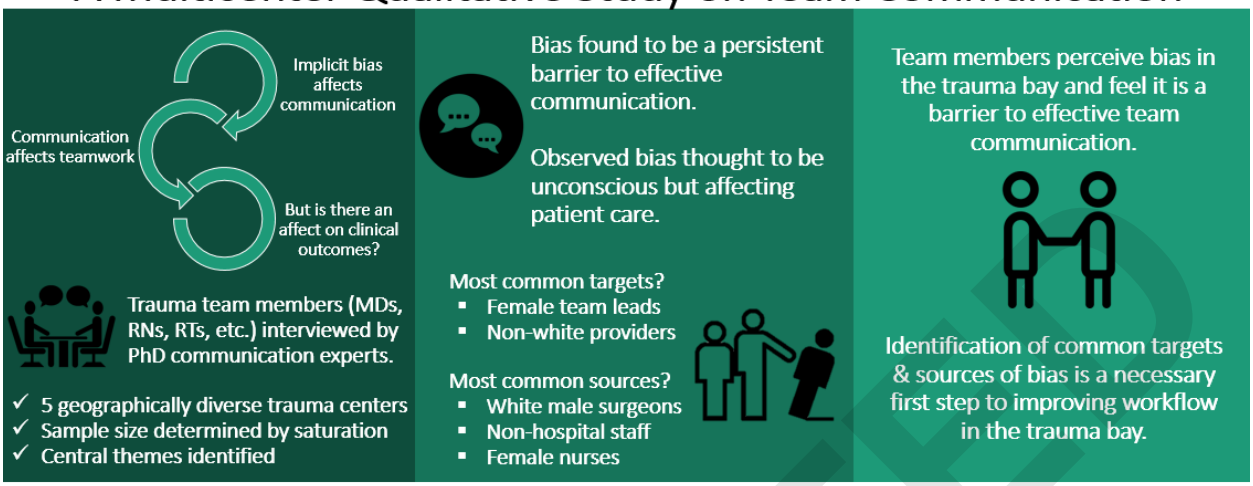
Topic	Item No.	Guide Questions/Description	Reported on Page No.
Domain 1: Research team and reflexivity			
Personal characteristics			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	
Occupation	3	What was their occupation at the time of the study?	
Gender	4	Was the researcher male or female?	
Experience and training	5	What experience or training did the researcher have?	
Relationship with participants			
Relationship established	6	Was a relationship established prior to study commencement?	
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	
Interviewer characteristics	8	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	
Domain 2: Study design			
Theoretical framework			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	
Participant selection			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	
Sample size	12	How many participants were in the study?	
Non-participation	13	How many people refused to participate or dropped out? Reasons?	
Setting			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	
Presence of non-participants	15	Was anyone else present besides the participants and researchers?	
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	
Data collection			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	
Repeat interviews	18	Were repeat inter views carried out? If yes, how many?	
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	
Field notes	20	Were field notes made during and/or after the inter view or focus group?	
Duration	21	What was the duration of the inter views or focus group?	
Data saturation	22	Was data saturation discussed?	
Transcripts returned	23	Were transcripts returned to participants for comment and/or	

Topic	Item No.	Guide Questions/Description	Reported on Page No.
		correction?	
Domain 3: analysis and findings			
Data analysis			
Number of data coders	24	How many data coders coded the data?	
Description of the coding tree	25	Did authors provide a description of the coding tree?	
Derivation of themes	26	Were themes identified in advance or derived from the data?	
Software	27	What software, if applicable, was used to manage the data?	
Participant checking	28	Did participants provide feedback on the findings?	
Reporting			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	
Data and findings consistent	30	Was there consistency between the data presented and the findings?	
Clarity of major themes	31	Were major themes clearly presented in the findings?	
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

Once you have completed this checklist, please save a copy and upload it as part of your submission. DO NOT include this checklist as part of the main manuscript document. It must be uploaded as a separate file.

Bias in the Trauma Bay:
A Multicenter Qualitative Study on Team Communication



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