

The impact of organisational and individual factors on team communication in surgery: A qualitative study.

ABSTRACT

Background: Effective teamwork and communication is a crucial determinant of patient safety in the operating room. Communication failures are often underpinned by the inherent differences in professional practices across disciplines, and the ways in which they collaborate. Despite the overwhelming international support to improve team communication, progress has been slow.

Objective: The aim of this paper is to extend understanding of the organisational and individual factors that influence teamwork in surgery.

Design: A grounded theory approach was used.

Setting and Participants: A purposive sample of 16 participants including surgeons, anaesthetists, and nurses who worked in an operating room of a large metropolitan hospital in south east Queensland, Australia, were selected.

Methods: Participants were interviewed during 2008 using semi-structured individual and group interviews. All interviews were recorded and transcribed. Using a combination of inductive and deductive approaches, thematic analyses uncovered individual experiences in association with teamwork in surgery.

Results: Analysis generated three themes which identified and described causal patterns of multidisciplinary teamwork practices; *multidisciplinary diversity in teams contributes to complex interpersonal relations, the pervasive influence of the organisation on team cohesion, and, education is the panacea to improving team communications.*

Conclusions: The development of shared mental models has the potential to improve teamwork in surgery, and thus enhance patient safety. This insight presents a critical

first step towards the development teambuilding interventions in the operating room that would specifically address communication practices in surgery.

Key Words: communication; multidisciplinary; operating room; patient safety; surgery; teamwork.

What is already known about this topic?

- Communication failures contribute to nearly 70% of sentinel events
- Effective teamwork is essential in high risk environments such as the operating room
- There are differing communication styles used by various members of the surgical team which on occasion, lead to communication failures

What this paper adds:

- This paper extends understanding of the root causes of the organisational and individual influences that impede teamwork and communication in surgery
- This paper suggests that the use of a 'shared mental model' in surgery has the potential to improve multidisciplinary communication in surgery, and thus enhance patient safety in the operating room context

The impact of organisational and individual factors on team communication in surgery: A qualitative study.

Background

Internationally, the vital role of multidisciplinary communication is acknowledged as a critical determinant of team performance, and hence, minimizing errors and harm in healthcare (Dayton and Henriksen, 2007). It is especially important in high-risk environments such the operating room (OR) where there are complex multidisciplinary interactions among highly specialized professionals – that is, surgeons, nurses, anaesthetists, and technicians. OR teams are, on a daily basis, confronted with potential uncertainty inherent in surgery, sophisticated equipment, rapid transfer of information, and the patient's condition. Thus, teamwork ideally involves the flawless synchronization of many small tasks that constitute the procedure. Yet, while there has been strong support advocating the imperative for improved teamwork and communication among multidisciplinary teams in surgery, progress has been slow, constrained by various contextual and historical factors. The aim of this qualitative study was to broaden our understanding of the organisational and individual factors that influence multidisciplinary communication in surgery.

Literature Review

Effective multidisciplinary communication is an essential prerequisite for cohesive teamwork in surgery – and its absence has been associated with devastating adverse events that can impact on service delivery, patient safety, and outcomes (Schaefer et al., 1995). Data collected by the Joint Commission in the US on Accreditation of Healthcare Organisations indicated that poor communication

contributed to nearly 70% of sentinel events during 2005 (JCAHO, 2007). In Australia, about 50% of adverse events in Australian hospitals occur as a result of communication failures between healthcare professionals, in particular, nurses and doctors (AIHW, 2007). Communication failures represent the disconnect between the particular communication practices used across professional disciplines and the specific collaborative expectations and work process improvements (Bleakley et al., 2006). In surgery, such disparate collaborative expectations are often reflected in suboptimal teamwork practices.

Some studies have described the substantial discrepancies in perceptions of teamwork were held by surgeons and nurses (Makary et al., 2006, Sexton et al., 2000). Surgeons rated the teamwork of others as good, while nurses perceived teamwork as poor. Such differences underscored the disparity in perceptions held by these disciplines with regard to effective teamwork. It appears that there are fundamental disparities in the way that nurses and doctors are trained to communicate (Leonard et al., 2004). Nurses are taught to communicate in very broad narratives in their descriptions of clinical scenarios. Conversely, doctors are trained to be very succinct, and quickly get to the crux of the situation. These elementary differences in styles of communication used by various groups of healthcare professionals have been associated with communication failures (Lingard et al., 2002), and hence impede team cohesion at this level.

Within the OR context, there is the persistent effect of time pressures, workload, and competing workflow priorities, limiting opportunities for multidisciplinary communication, especially during preoperative preparations (Gillespie et al., accepted 1st March 2009). Lingard and colleagues' (Lingard et al., 2005, Lingard et al., 2006, Lingard et al., 2008, Lingard et al., 2002) series of studies

conducted in Canada indicated that critical information was passed on in an ad hoc, often reactive manner – culminating in communication failures that have the potential to result in adverse events. Consequently, it is essential to target teamwork vis-à-vis communication practices as a means of improving patient safety.

METHODS

Objective

The aim of this study was to better understand the organisational and individual influences that shape multidisciplinary team communications in surgery. Such an understanding is important as it will inform the identification of interventions that would improve communication practices used by surgical teams. A grounded theory analysis of a subset of data is reported elsewhere (Gillespie et al., accepted 1st March 2009). This paper reports the findings in their entirety.

Design

Qualitative interviews were conducted and a grounded theory approach underpinned by Strauss and Corbin's (1990) methods was used to generate a theory that identifies factors that influence teamwork among surgical teams.

Setting and Participants

The setting was an OR department in a large public hospital in southern Queensland, Australia. Potential participants included in the sampling frame were doctors, nurse managers, and clinical nurses who practiced across various surgical specialties which included orthopaedic, neuro surgery, ophthalmology, general and

vascular surgery, gynaecology and urology, were interviewed. Participants were approached if they displayed an interest in the study or were recommended by other potential participants. This study sought to identify personal and organisational factors that shaped teamwork in surgery, and therefore participants were selected based on their ability to render useful insights into these phenomena.

Data Collection

Demographic data were collected in relation to participants' age, years of clinical experience, and professional and/or clinical role. Eight semi-structured interviews were conducted with 16 OR team members from nursing, surgery and anaesthetics. Of these, four group interviews were conducted with nurse managers and clinical nurses who worked across various surgical sub-specialties while the other four were conducted individually with medical staff (two surgeons and two anaesthetists). While nurses represented the majority of interviewees, they also had the highest professional representation in this OR, and therefore the numbers of doctors and nurses interviewed reflected these proportions across disciplines.

Group interviews were conducted with nurse participants who belonged to the same staff category to diffuse potential status differentials, and ensuring group homogeneity (Klueger, 1994). Medical participant interviews were conducted individually as there were limitations in relation to their availability. All interviews were conducted by the first author in a quiet location, lasted 45 to 60 minutes, and were digitally recorded for later transcription. Interviews were guided by a set of questions, identified through the literature. For example, some of the interview questions were: "*What individual and/or team characteristics promote effective communication?*"; "*What are some of the barriers to communication and teamwork*

in surgery?”, “*How do you think communication could be improved among team members?*” and, Interviews explored issues surrounding strategies currently used by multidisciplinary teams to enhance teamwork, as well as identifying impediments to teamwork. Data saturation was evident when no new information was forthcoming.

Ethics

Ethical approval was given by the hospital and the university ethics committees. Confidentiality and data protection were adhered to as minimum standards. Participants were given an invitational letter detailing the study’s aims, procedures, potential risks and benefits. Participants signed a consent form and completed a brief demographic profile.

Data Analysis

Familiarization with the data involved listening to recorded interviews and repeatedly reading the transcribed data (Lacey & Luff, 2001). All interview data were coded and categorized using constant comparative methods as described by Strauss and Corbin (1990). Different colours were used for coding sections of the transcript that contained content of a similar nature. The coded blocks were further explored and labeled under common headings, or categories, that best described the content of the data. Further review of the list of categories involved sorting and identifying those that cohered together meaningfully such that they represented an overarching theme (Braun & Clarke, 2006).

The decision regarding theme identification was based on repeated occurrences of dialogue with similar content, both within and across interviews. Metaphorical descriptions which served as symbolic constructions of individual

meanings and experience (Ryan & Bernard, 2003), were also used in theme identification when they answered a crucial aspect of the overall research question. Data saturation was evident in the way that no new information was forthcoming during group and individual interviews.

The extracted themes and their corresponding explanatory data were cross-checked between the researchers to ensure consensus. Finally, a concept map, representing themes and their related categories, was constructed to organise the data, and thus illustrate the findings using a cause-and-effect schema (Levinson, 2006).

Rigour

In this study, rigour was considered in relation to trustworthiness, auditability, transferability (Guba and Lincoln, 1994). All members of the research team were involved in data analysis to establish trustworthiness. Preliminary findings were taken back to participants to clarify and confirm (i.e., 'member-checking'), thus contributing to trustworthiness. Memos connecting codes to pieces of verbatim supported the emergent categories, and demonstrated an audit trail in the decision-making process. Participants were selected based on their expertise in the OR context, and on this level, there may be conceptual transference of findings to other similar OR settings as surgical team members may identify similarities in relation to experiences, attitudes and situations.

Findings

A total of 16 participants agreed to be interviewed and included 12 nurses, two surgeons and two anaesthetists. Participant's age ranged from 25 to 63 years; the average age was 44 years (SD = 12.6), and years of experience averaged 15.8 years

(SD = 13.2). Three themes emerged from the analysis of interview data; ‘multidisciplinary diversity in teams contributes to complex interpersonal relations’, ‘the pervasive influence of the organisation on team cohesion’, and ‘education is the panacea to improving team communications’. Themes are described below, with categories italicized. Diagram 1 shows the relation between themes and categories. The ‘fishbone’ diagram uses a cause-and-effect schema and thus was considered appropriate for illustrating the root causes of multidisciplinary teamwork problems in a cogent visual format (Levinson, 2006).

<Insert Figure 1 here>

Multidisciplinary diversity in teams contributes to complex interpersonal relations

The theme, ‘multidisciplinary diversity in teams contributes to complex interpersonal relations’ was described in terms of interpersonal and social aspects that shaped team behaviour in surgery. ‘Multidisciplinary diversity’ shaped communications among team members, the occasion, and the content of those information exchanges. Subsumed in this theme, were four interlinking categories, *professional culture and mores*, *professional leadership*, *interchanging team membership* and *the primacy of sub-specialization*.

The dominant influence of *professional culture and mores* on team dynamics was evident in participants’ sense of professional identification, and was manifest in a high degree of independence, which, on occasion, limited the impetus for multiprofessional collaboration. One surgeon commented on the historical emphasis on individualism in surgery,

Surgery has always been a bit of an autocratic environment where the surgeon waltzes in... but working together is difficult and trying to teach surgeons not to be silo is a difficult thing... surgeons have been lone wolves. For a theatre to work that has to be one team, it cannot be three individual silos... (Surgeon, Interview 6)

Nonetheless, a “silo” mentality was not a characteristic exclusive to surgeons – this notion was also confirmed by nurse participants who acknowledged a three team tripartite,

There are three teams, the anesthetic team, the surgical team and the nursing team...nurses think of themselves as the nursing team not part of the neuro team necessarily... (Registered Nurse, Interview 5)

Participants described the demarcation of individual roles and acknowledged that this often limited team dialogue; yet, it concomitantly contributed to team efficiency and performance. For instance, decisions about surgical and anaesthetic equipment requirements were made independently by nurses and medical staff, respectively, based on surgeons’ preferences, preoperative assessments, and “routine” expectations for a given procedure. Participants described instances where preoperative preparations occurred in the absence of conversation among team members. Within these multidisciplinary teams, well-defined roles also determined the nature of information exchanged and the timing of that exchange. Therefore, the three disciplines had significantly different access to information about surgical patients and procedures.

In illustrating the category, *professional leadership*, there was variation in among surgical team members’ perspectives vis-à-vis the quintessential qualities

required for good leadership,

A strong leader should lead from the front, and should not expect any of the team to do things that he [sic] is not able to do himself [sic] ... there can only be one pilot in a cockpit, one chief surgeon in a case. Most of the time you [surgeon] need to be willing to take the responsibility for that patient, that decision, that clinical case...

(Surgeon, Interview 3)

It appeared that leadership was considered inexorably linked to the level of responsibility and decision-making required to perform the task in question – surgery, and thus, was overtly underpinned by professional identity. In contrast, nurse participants described leadership in terms of the ability to communicate effectively with others in delineating role expectations:

If someone is taking on a senior role then everyone should know what their role is as soon as possible, and establish others' roles and what is expected of them, then you are more able to contribute more effectively... you have to be upfront about your strengths.

(Registered Nurse, Interview 1)

The categories *interchanging team membership* and the *primacy of sub-specialization* were illustrated in the ways participants described the fluidity of teams, that is, where members, especially nursing staff, moved in and out of different surgical teams. Nurses described the divergence in the specialties they worked, the times they worked, and their daily work schedules were characterized by interruptions. This limited opportunities to meet and form regimens of shared practice and knowledge. Medical participants perceived discontinuity of nursing staff as problematic because there were occasions when nursing staff involved in the surgical

list lacked the necessary knowledge of the procedure and its associated instrumentation, and the individual preferences of the surgeon and/or anaesthetist. The primacy of “sub-specialization” was considered by medical participants as crucial for the smooth running of the list:

You have to have nurses that sub-specialize into those areas because in order for everything to work well in theatre the nurse has to know her [sic] specialty and there is nothing more disruptive than someone saying” I have never done this case before, I don’t know the name of the instruments”, and you can just see it all falling down. (Surgeon, Interview 6)

Situations where nurses were unfamiliar with both the procedure and the surgeon intensified the potential for multidisciplinary conflict, and thus hampered effective communication and teamwork. Clearly, working in surgical lists with regular, competent staff, contributed to good communication and teamwork. For the majority of participants, working in established teams implied a familiarity with the nuances of procedure and the surgeon, as well as knowledge of the strengths and limitations of other team members. Hence, teams worked in anticipatory, co-operative ways which enabled the surgical list to run efficiently, even when the operations were complex and prolonged.

The pervasive influence of the organisation on multidisciplinary team cohesion

The second theme, ‘the pervasive influence of the organisation on multidisciplinary team cohesion’ described the omnipresent ways in which organisational culture impacted on team dynamics in surgery. Decisions made in regard to organisational policies, albeit at the strategic level, profoundly influenced

clinical practice among multidisciplinary teams. Three entwined categories, *culture of blame*, *haphazard implementation of a prebriefing protocol* and *finite resources* were encompassed in this theme.

The category, *culture of blame* was perceived as being perpetuated by the organisation through its emphasis on policies which, on occasion, gave rise to multidisciplinary conflict. One medical participant stated,

A blame culture persists and the fact that the first jump is to write an incident report... Why don't we talk this through that would be a much better way than the blame game? Many issues are escalated rather than diffused and that is being promoted not only between nurses and doctors, but doctors and doctors, and is detrimental to teamwork. (Anaesthetist, Interview 8)

Such policies were seemingly perceived as tools for apportioning “blame” rather than as an opportunity for learning – albeit that they were introduced for the “greater good”. Consequently, their use was viewed as having a discordant influence on team communication, culminating in dissonant attitudes among the various disciplines.

The categories, *haphazard implementation of a prebriefing protocol* and *finite resources* illustrated the bureaucratic approach used to introduce patient safety initiatives, such as a prebriefing protocol, and the human and material resources allocated to ensure its uptake in the clinical environs. Participants perceived a lack of support from the organisation in relation to the allocation of sufficient resources needed to properly implement and sustain such initiatives, which became enshrined in hospital policy. Nurse participants described the organization’s emphasis on “increased productivity” and a lack of adequate nursing staff meant that often, lists were running with only “skeleton staff”. Thus, the addition of performing a

prebriefing check at one of the busiest times during pre-surgery preparations only intensified the stress experienced by nursing staff in particular.

Medical participants, while acknowledging the importance of patient safety initiatives, expressed concern in relation to the apparent disregard for their input during the organisational introduction of a structured prebriefing protocol prior to the commencement of surgery. One surgeon commented,

We need to insist that a system is in place, not rigid, not trying to dictate from above with this motherhood attitude to surgery... I need to be sure that I am doing the right thing; each person has to have a system that works...if your check system is the same, and then it is useful. If you are going to make a ritual of it then it is not useful.

(Surgeon, Interview 3)

Evidently, medical participants used their own checking systems, which they enacted prior to the organisational introduction of prebriefings. However, checking systems varied among surgeons, and the subtleties therein were not always explicitly communicated to nursing staff. As a corollary of a perceived lack of clarity, nurse participants stated they would, on occasion instigate this check, even in the absence of the surgeon. This occasional uncertainty fuelled multidisciplinary conflict between members of the medical and nursing staff in relation to “who” is ultimately responsible for the prebriefing, and “when” this check is performed. One nurse declared,

If this is a surgeon driven thing, why should we take the responsibility, because if the wrong leg is cut off, then we did the final check, the surgeon wasn't there, are we then responsible?

(Registered Nurse, Interview 7)

Education is the panacea to improving team communications

The theme, ‘education is the panacea to improving team communications’ centered on the provision of education as a means to increase collaboration and acceptance among team members. Education was described by participants as the universal remedy that provided the impetus for a move away from historically entrenched team attitudes and behaviours. Included under this theme were three interconnected categories; *education changes culture, education improves communication, and education increases professional understanding.*

The categories, *education changes culture* and *education improves communication* emphasised the need for early enculturation in the use effective communication strategies and teambuilding techniques during the formative period of professional learning – that is, during student training.

Again culture will be slow to change so we have to hold tight and I think education is a key at a young level. With team building you have to get to the medical students and it has to start from there and be continual updates. Start with the young. (Surgeon, Interview 6)

Some participants believed that there was little to be gained by trying to re-educate some of the “older nurses and doctors” – a case of too little, too late. Rather, education to change the culture of surgical teams would be best addressed by targeting the younger doctors and nurses – to this end, multidisciplinary education is more likely to have an enduring effect on team communication and cohesion. Notwithstanding this, participants affirmed that initiating changes in team culture is often slow and onerous; although “the way forward” was through ongoing education programs,

You need to start with education programs and they should include communication courses... education on effective communication and teaching young ones to not be scared... (Registered Nurse, Interview 4)

There was a palpable recognition among participants vis-à-vis the crucial role communication played in creating cohesive teams. Nurse participants in particular, discussed the differences in communication styles used by the various disciplines, and the importance of understanding such differences.

The category, *education increases professional understanding* was reflected in participants' comments about individuals' personalities and roles within the team, and the ways in which these interfaced with others during surgery. Participants explained the need for education in managing the myriad of different personalities that make up surgical teams,

People need to know about different personalities and how to deal with those personalities. Why they say the things they do, because most of the problems that you run into are if someone has a particular personality... A workshop would be good with different personalities. (Registered Nurse, Interview 4)

Crucially, participants identified instances where there was distinct a lack understanding for such differences, which increased the opportunities for miscommunications – and accordingly had a detrimental effect on teamwork.

Discussion

In this study, three themes emerged as being key to effective communication and team cohesion; 'multidisciplinary diversity in teams contributes to complex

interpersonal relations’, ‘the pervasive influence of the organisation on team cohesion’, and ‘education is the panacea to improving team communications’.

The first theme revealed that disparities in professional orientation were explicitly underpinned by historical differences between nurses and doctors in relation to gender, authority, and patient care responsibilities – and contributes to ‘uniprofessional identification’ (Bleakley et al., 2006). In our study, this notion was exemplified by the disconnected nature of team communications. Participants dichotomized their roles within the team, reinforcing the notion that teamwork behaviours in surgery are largely informed by professional culture and identity, and level of responsibility. Ideally, OR teams should be unitary and cohesive to maximize their performance (Edmondson, 2003). Our findings extend the notion of professional independence in surgery – which has been described in previous work in relation to clinical expertise (Leonard et al., 2004). Paradoxically, professional independence is both an advantage and a limitation vis-à-vis communication practices. One of the advantages of professional independence is the tacit knowledge team members possess in relation to standard regimens of care – thus allowing team members to perform their defined tasks in a coordinated, seamless manner. Nonetheless, the focus on demarcated individual roles does not tend to encourage team talk about procedural requirements. Conceivably, this uniprofessional approach to communication is an obstacle to team cohesion and performance.

Minimal information exchange as an accepted practice in OR culture – is considered a defensible strategy because safety is perceived in relation to personal competence. Yet, with the use of minimal communication among team members, inconsistencies and missing information have a tendency to remain undetected (Lingard et al., 2006). Given that inconsistencies occur infrequently, it is reasonable

to assume that team members would perceive their communication processes as largely reliable. Nevertheless, inconsistencies become discernable during emergent problems, such as when there is more blood loss than expected during surgery and it is obvious that insufficient blood products have been ordered. Clearly omissions in team communication vis-à-vis checking and confirming information using standardized processes compromise patient safety (Gillespie et al., accepted 1st March 2009, Lingard et al., 2006). Without standardized communication processes to cross-check information sources, there is no safeguard against capturing latent errors – that is, failures created as a result of decisions taken at the higher echelons of the organisation (Reason, 2005).

The second theme illustrated the impact that organisational context had on teams' communication practices. Our findings described participants' general lack of confidence in the organisational context in regard to resource allocation and the introduction of patient safety initiatives mandated to improve team communications. Conceivably, bureaucratic decision-making vis-à-vis policy design and resource allocation was ostensibly far removed from the front-line activities of surgical teams in the OR. In our study, a culture of "blame" was not conducive to effective teamwork; and it appeared that the organisation did not promote a culture of collaboration. That is, considered communication, debate and feedback, and hence challenges a culture where scapegoating and control are valued over learning from error (Bleakley et al., 2006). A collaborative culture is informed by reflection on recent history, and there is an acceptance of an inevitable degree of uncertainty as safety initiatives are implemented to change practice – acknowledging that over time, protocols themselves must change. Essentially, this must be done collectively, and underpinned by a respect for difference among clinicians. Tolerance of differences

provides the impetus for lively discussion about the quality of safety practices (Bleakley et al., 2006).

The third theme described education as central to changing culture and increasing understanding among multidisciplinary team members. While the goal of any education strategy should ultimately engage deliberate and ongoing changes that address multidisciplinary communication practices, there is an important initial step. Changing entrenched clinical practices depends upon prior attitude change (Bleakley et al., 2006). Still, only when attitudinal change is accumulative is it possible for the emergence of a new culture (Genn, 2001). Good teamwork starts with a set of attitudes and values. Our participants' teamwork behaviours were characteristically modeled on notions of uniprofessionalism. Without first valuing multiprofessionalism over uniprofessionalism, it is impossible to progress a collaborative culture, one that is founded on work-based learning (Bleakley et al., 2006). In our study, it was acknowledged that culture change would proffer sustained change only if education occurred during the formative training period. Necessarily, while multidisciplinary education needs to be incorporated into professional development programs, it must also be embedded into medical and nursing undergraduate curricular. Education programs that emphasize skills in leadership, communication, and conflict management are critical for collaborative practice (Clark, 2006).

Overall, our findings suggest that *shared mental models* may have clinical utility in surgery. Shared mental models enhance the ability of team members to predict the needs of others in the team, and strategize during situations that change unexpectedly (Mathieu et al., 2000). Essentially, using a shared mental model enables the team to discuss the next contingency, and is not heavily reliant on pre-existing knowledge – thereby reducing the possibility of omissions and inconsistencies in

communication. This is especially important in surgery, where changes in patient condition occur on a moment-by-moment basis, consequently optimal teamwork is essential. Previous work has demonstrated the association between poor teamwork and a higher rate of surgical complications (Aggarwal et al., 2004). Undoubtedly, team instability limits the opportunity for surgical teams to develop a shared mental model, and thus impacts negatively on team communication and performance.

Organisational issues such as heavy clinical workloads, the need to increase productivity, and time constraints create conditions that potentially impede communication practices. In this instance, shared mental models become crucial to team functioning because they allow team members to predict information and resources needs of other team members.

The use of structured communication methods such as pre-and post surgical briefings enables surgical teams to develop shared mental models in the clinical milieu. The use of pre-briefings in surgery enables team members, who often come together on an ad hoc basis, to become familiar with the patient's history and specific procedural requirements (Makary et al., 2006). Team pre-briefings provide opportunities for interactive communication, where members can give feedback, identify areas of concern in relation to important safety and operational issues, and establish guidelines for workload distribution. Post briefings provide team members with opportunities to identify any deviations from the surgical plan and to uncover any defects that may not be apparent at the time of the surgery. Post briefings encourage a culture of learning that involves action, reflection and revision (Makary et al., 2006).

Limitations

We acknowledge this study has several limitations. First, the single locale in which the study was conducted limits the extent to which findings may be generalised because the doctors and nurses working in this hospital may in some way, be unusual. Notwithstanding this, there was representation of the various disciplines that comprise multidisciplinary surgical teams, and subsequently permitted diverse professional perspectives. Moreover, our findings are consistent with various other studies of communication in surgery (Lingard et al., 2006). Second, the dissimilar methods of interview used for nursing and medical participants may have given rise to different dynamics during interviews. However, similar issues were explored during these interviews and data saturation was achieved. Third, the considerably lower proportion of doctors interviewed as compared with nurses and there may not adequate representation of medical participants' perceptions. Finally, we have identified and described individual and organisational factors that overtly impinged on multidisciplinary teamwork; however, there may be other influences not explored in this study.

Conclusion

In surgery, effective communication is vital, and its absence is evident in poor transfer of critical information, impaired decision-making, and may ultimately lead to patient harm. Undoubtedly surgical teams are part of a wider system of processes and relations that produce the kinds of errors traditionally headlined in the patient safety literature, such as wrong site surgery. Further, such events may be tacitly connected to less visible communication failures in surgical teams as a result of embedded organisational practices and uniprofessional identity issues. Clearly, there are

challenges associated with enacting communication practice changes both at the organisational and individual levels. Research on transforming the practices of health care providers in respect to teambuilding interventions that promote the use of shared mental models in surgery would be timely and useful. Good communication is an integral component of the culture of teamwork and as such, an important surrogate of patient safety.

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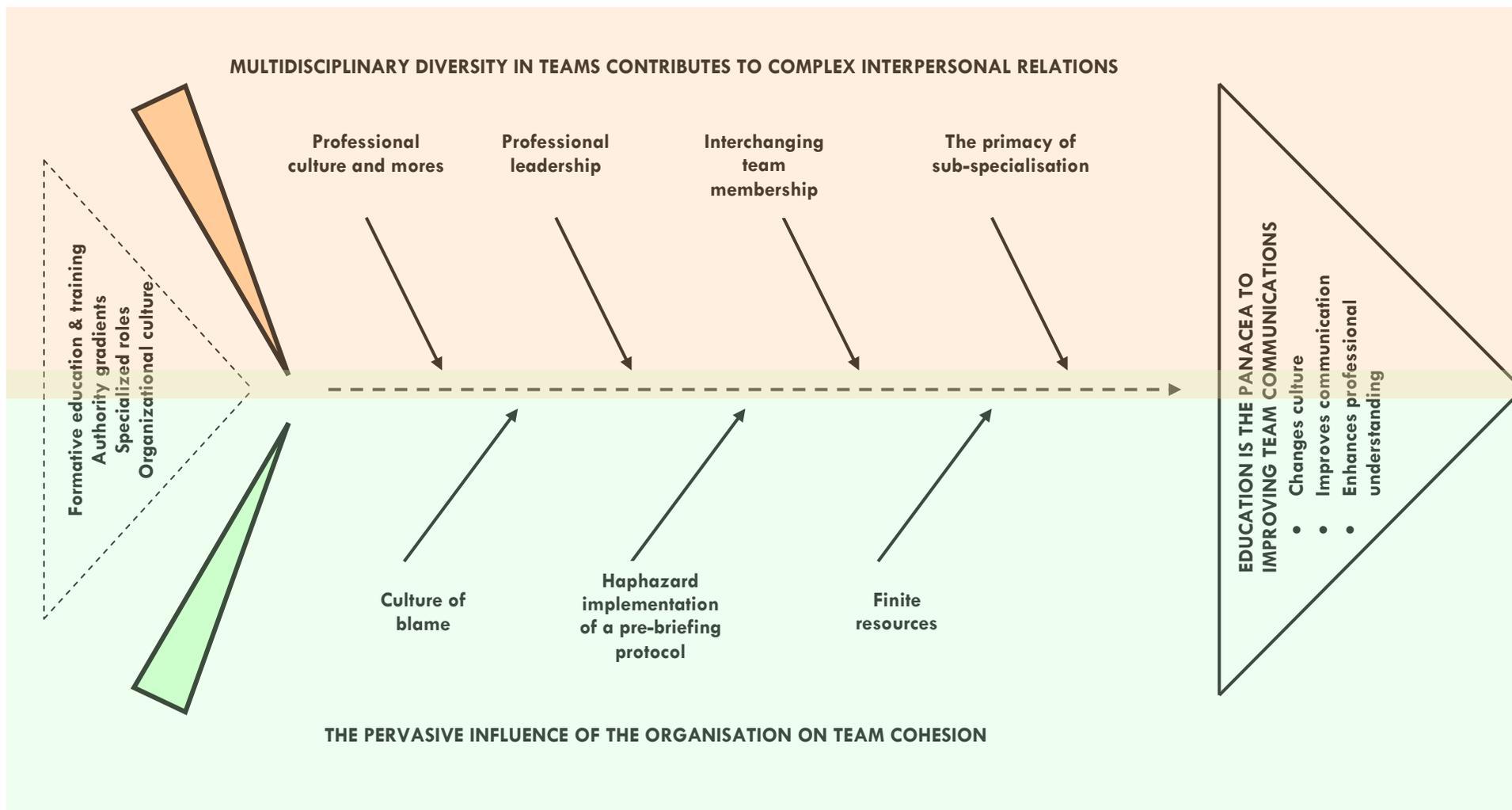


Diagram 1: Fish bone schema illustrating cause-and-effect influences of organisational and individual factors on teamwork in surgery