

Team Working in Intensive Care: Current Evidence and Future Endeavors

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Abstract

Purpose of review: It has recently been argued that the future of intensive care medicine will rely on high quality management and teamwork. Therefore, this review takes an organizational psychology perspective to examine the most recent research on the relationship between teamwork, care processes and patient outcomes in intensive care.

Recent findings: Interdisciplinary communication within a team is crucial for the development of negotiated shared treatment goals and short-term patient outcomes. Interventions for maximizing team communication have received substantial interest in recent literature. Intensive care coordination is not a linear process, and intensive care teams often fail to discuss how to implement goals, trigger and align activities, or reflect on their performance. Despite a move towards interdisciplinary team working, clinical decision making is still problematic and continues to be perceived as a top-down and authoritative process. The topic of team leadership in intensive care is underexplored and requires further research.

Summary: Based on findings from the most recent research evidence in medicine and management, four principles are identified for improving the effectiveness of team working in intensive care; engender professional efficacy, create stable teams and leaders, develop trust and participative safety, and enable frequent team reflexivity

Keywords: Teamwork, communication, team performance, patient safety, intensive care unit.

Introduction

Research from both management and medicine has consistently advocated effective team-based working as the optimal work method in healthcare settings. The dynamic environment in which healthcare teams operate is characterized by high levels of complexity, workload, and pressure, with decision making and errors having profound consequences for care processes and patient outcomes. This is particularly true in the context of intensive care, where life-threatening and time-critical conditions require the synchronized and collaborative actions of different professionals working together as an effective interdisciplinary team. The importance of team working in healthcare is clearly reflected in recent healthcare policy. Teamwork and improving clinical communication are emphasized as imperatives in the recent UK and international documents [1,2]. Therefore, the fundamental challenges faced by healthcare organizations in the future are not only clinical, but organizational [3]. The future of intensive care practice will rely on management and teamwork, and, in particular, the non technical skills that effective teamwork facilitates such as active listening, communication and empathy [4]. Therefore, the objective of this paper is to take an organizational psychology perspective to examine the most recent and compelling evidence for the impact that teamwork and communication have on care processes and patient outcomes in intensive care and to provide a number of key principles for improving the effectiveness of such teams in the future.

Defining the key concepts

Before reviewing the research evidence, it is important to define key terms in the literature on teams, beginning with the definition of a team itself.

'A team can be defined as (a) two or more individuals who (b) socially interact (face-to-face or, increasingly, virtually); (c) possess one or more common goals; (d) are brought together to perform organizationally relevant tasks; (e) exhibit interdependencies with respect to work flow, goals and outcomes; (f) have different roles and responsibilities; and (g) are together embedded in an encompassing organizational system, with boundaries and linkages to the broader system context and task environment.' [5 p.79]

Teams share mutual accountability and engage in interdependent tasks towards the accomplishment of shared and meaningful goals via teamwork processes.

'Teamwork' refers to 'the dynamic, simultaneous and recursive enactment of process mechanisms which inhibit or contribute to team performance and performance outcomes.' [6 p.190]

The collective nature of team tasks require members to interact, collaborate and share knowledge and resources, meaning that they are dependent on one another for task accomplishment. Teamwork therefore defines the integrated contributions of team members which facilitate adaptive and coordinated outputs. Team performance is the product of both individual task work performance and teamwork processes.

Accordingly, team effectiveness is defined as *'an evaluation of the outcomes of team performance processes relative to some set of criteria'*. [7 p.41]

Evidence from recent research

To review the most recent research findings we will use the Intensive Care Unit (ICU) Team Performance Framework [8]; (see Figure 1) which has integrated research findings prior to 2009. In a review of 35 studies investigating teamwork in the ICU, Reader *et al.* identified four key teamwork processes which have been consistently shown to predict outcomes in intensive care; team communication, team leadership, team coordination and team decision-making.

Team communication

Communication is inherent in effective teamwork, given that teams working on highly interdependent and complex tasks must constantly share information, discuss divergent perspectives, reflect on their progress and agree upon shared goals. Previous research has identified a number of important features of team communication in intensive care, including speaking-up behaviors, clear and direct requests for team assistance, and closed-loop communication [8]. However, ICU patients remain particularly vulnerable to communication errors given that lack of communication has also been identified as a main source of conflict in ICU teams [9]. Further, research findings have demonstrated that poor communication in the paediatric ICU (PICU) has a detrimental impact on trust, which, in turn, is perceived to negatively affect care-giving practices [10,11].

A recent study has explored the patterns of communication between residents and fellows in a surgical ICU and how these relate to short-term patient outcomes [12]. A prospective observational trial of cardio-respiratory events in over 100 surgical ICU patients identified that 33% of events had communication errors between residents and fellows. However, effective resident-fellow communication significantly predicted improvements in short-term patient outcomes. The study also incorporated an intervention phase which provided residents with a formal communication seminar and a fellow 'call in' every night to assess for potential events. In the intervention phase, communication errors in the late shift were reduced by 10%, demonstrating that structural changes to communication processes can help mitigate against poor intra-team communication.

Another barrier to effective interdisciplinary communication relates to the potentially divergent perspectives of different professional groups. A recent study examined the effects that intradisciplinary and interdisciplinary teams had on verbal communication in two Australian ICUs [13]. Previous findings have shown that during handovers, physicians typically focus on expectations about patient disease trajectories, whereas nurses are more concerned with data and treatment information, both of which reflect their own clinical roles [14]. This study proposed that interdisciplinary communication during rounds and handovers provides a mechanism for the negotiation and agreement of perspectives. Results confirmed that integrated clinical goals which took account of both physician and nurse orientations emerged to a greater extent in interdisciplinary ward rounds, where there was the opportunity to ask questions, share information and provide comments between different professionals. Interdisciplinary communication therefore remains crucial for the development of

negotiated shared goals, which, in turn, have been shown in previous research to impact on reduced length and cost of stay in the ICU. The development of shared goals is also crucial for fostering team commitment and a shared sense of identity which makes effective teamwork possible. Conversely, failure to develop consistent treatment goals among ICU staff has been identified as a key source of intra-team conflict, which, in turn, is perceived to impact on outcomes such as decreased quality of patient care, staff burnout and wasted resources [9].

Another study looked at whether specific elements of communication impact upon patient outcomes [15]. Nurses' perceptions of timeliness, accuracy, openness, and understanding of communication with physicians were compared with patient outcomes. Timeliness of communication was negatively associated with the prevalence of pressure ulcers, suggesting that timely communication can increase physicians' awareness of patient issues. Further, in combination with capacity utilization, the variability of nurses' understanding of communication with physicians accounted for 27% of the variance in ventilator-associated pneumonia incidence, suggesting that urgent action should be taken to improve the clarity and interpretability of nurse-physician communication. Indeed, interventions for maximizing effective team working communication have continued to receive substantial interest in recent literature [16,17,18,19].

Team leadership

Team leadership is crucial for team effectiveness. Team leaders facilitate the development of shared objectives, oversee decision making processes and guide the

team to reach their synergistic potential, whereby the collective effort surpasses the sum of individual contributions [5]. Previous evidence has highlighted the importance of effective team leadership on patient outcomes in the ICU [8]. However, there are few rigorous examinations of the competencies needed by senior physicians who lead ICU teams. Future research should examine the link between leadership behavior and team effectiveness in order to develop leadership programmes that are appropriate for the intensive care arena [20].

A recent study in a French ICU which developed a governance program aimed at improving both intra- and inter-team communication identified leadership as a key feature for facilitating trust and respect in teams [18]. The program is based around the concept of collective leadership, emphasizing the need for shared responsibility between nurses and physicians, and thus mirroring more recent trends in team leadership research [5]. The program encourages high levels of participation and involvement, requiring teams to hold frequent team meetings, to involve all staff in difficult decision making, to provide clear information about the organization, values and rules of the unit, and also to interact frequently outside of the hospital, enabling intra-team relationships to form. The program has received positive feedback from both healthcare professionals and relatives. Reductions in standardized mortality ratios and nosocomial infections over the past ten years have also been recorded, although the authors acknowledge that these effects cannot be directly attributed to the program itself.

Team coordination

Team coordination refers to the processes which orchestrate the timing and sequencing of interdependent task work actions and teamwork behaviors. Effective coordination requires team members to clearly articulate their progress, status, needs and objectives to the rest of the team in an efficient and timely fashion so that teamwork behaviors adapt and synchronize accordingly. Coordination may occur through overt communication, or more subtly through team members' situation awareness and shared mental models relating to team roles, objectives and tasks. Complex and time-critical tasks in the ICU require interdisciplinary teams to integrate and combine different areas of expertise in a complementary, rapid and sequential manner during task execution. Interestingly, the sequence of nursing participation of individual team members has been shown to be positively related to family perceptions of nursing care quality, demonstrating the importance that team coordination has for continuity of care [21]. Teams must also be able to adapt their coordination during critical incidents to quickly correct discrepancies in team performance.

Klein proposes five phases of team coordination: preparation, planning, direction, execution and team assessment. However, results from a recent study which applied this model indicate that ICU care coordination does not unfold in such a linear sequential manner [22]. In this study the factors that contributed to care coordination breakdown included a displaced focus on patient planning, a lack of available tools and processes, and a lack of role responsibility for the execution of planned activities. Specifically ICU teams failed to discuss how to implement goals, or trigger and align their high priority activities. A lack of assessment of team progress and performance was also evident.

Team decision making

It is well documented that effective decision making in ICU teams impacts patient outcomes [8]. A recent study in a PICU adopted a participatory action research design to explore the care-giving practices of health-care practitioners [10]. Results highlighted three problematic areas for team functioning: decision making, relationships, and trust, with 81% of staff reporting that these factors compromise the quality of care they provide. Results confirmed that consultants were seen as the most proactive professional group with regards to decision making, reflecting the hierarchical structure of ICU teams. Staff shortages were also reported to compromise decision making. Further, lack of access to training, the pressures of shift work, and unavoidable absence from ward rounds were all considered to interfere with effective multidisciplinary decision-making. Nurses also discussed their reluctance to make or challenge decisions, and often chose to remain silent. However, when decision making was more inclusive, particularly when patient family-members were involved, confidence in intra-team relationships was enhanced. Overall, recent results suggest that despite a move towards interdisciplinary team working, clinical decision making is still perceived as a top-down and authoritative process [9].

Further principles for improving ICU teamwork and communication

In the development of the ICU Team Performance Framework, Reader *et al.* acknowledge that various concepts which have frequently featured in the

organizational psychology literature as important antecedents of team effectiveness are yet to be investigated in the ICU context. We suggest four specific areas which we believe will have a positive impact on both patient outcomes and team viability in intensive care:

1) *Engender professional efficacy*

New research has suggested that one way to facilitate collaborative practice in the ICU is to develop work environments that provide sufficient resources which enable staff to do their jobs well and thus increase the likelihood of ‘success experiences’ [23]. Results have demonstrated that professional efficacy beliefs positively impact on ICU nurses’ commitment to their work, which, in turn, improves the quality of collaborative practice between nurses and consultants. In accordance with IPO principles, the experience of positive collaborative practice in turn boosts nurses’ efficacy beliefs, thus creating a virtuous cycle between efficacy and collaboration. Enhanced professional efficacy, which enables nurses to rely on their own competence, is also likely to encourage them to contribute actively rather than remaining silent during multidisciplinary decision making.

2) *Create stable teams and leaders*

As shared mental models are assumed to converge over time, a degree of stability in ICU team membership is preferable for improving team coordination. Recent findings have indicated the team turnover has negative impacts on team learning behavior, social integration and task flexibility in self-managing teams [24]. Further, lack of

ICU member stability from one crisis to the next may leave physicians reluctant to invest time and effort into team development [25]. Conversely, a degree of membership stability enables team member familiarity which can facilitate positive intra-team behaviors, a shared team identity and smooth coordination. Recent research has also shown that nurses who develop a strong affective bond with their team are more likely to 'invest' in good quality future relationships with team colleagues [23]. In practice stability in these teams is hard to deliver for a large number of reasons.

Where possible, ICU teams should also have a stable team leader. The concept of leader-member exchange (LMX) captures the quality of the reciprocal relationship between leaders and subordinates, specifically with regards to the provision of emotional support and other crucial resources. Recent research has shown that high levels of LMX are crucial for establishing good working relationships in diverse groups [26], such as interdisciplinary intensive care teams. However, good quality leader-member relationships do not develop overnight. ICUs should therefore endeavor to create a stable leadership role which is occupied by a physician who not only has the appropriate clinical expertise, but also has well developed leadership skills and the ability to form positive, reciprocal relationships with all members of the team, regardless of their professional discipline or background.

3) Develop trust and participative safety

Team membership stability is also crucial for the development of trust and participative safety in teams. Trust has been identified as having an important impact on care-giving practices in intensive care [10]. In this study, trust was evident when

there was a high level of multidisciplinary cooperation on ward rounds and was perceived as signifying the mutual recognition of different professional practices and perspectives. Key facilitators of building trust included nursing management listening and responding to issues and consultant sensitivity towards other staff.

Participative safety is also a crucial team process which encourages engagement and commitment in teams and reduces resistance to change [27]. Participative safety refers to the extent to which members of a team feel safe and secure to speak-up and openly share information without fear of reprisal or embarrassment. This is particularly important in hierarchically structured ICU teams, in which team members lower in the hierarchy may be reluctant to communicate 'less major' events for fear of appearing incompetent [12]. However, the impact of participative safety on care processes and patient outcomes remains largely unexplored in the context of intensive care. We propose that a climate of participative safety will empower nurses to contribute more actively during multidisciplinary decision making and feel able to air their concerns or ask for support. Membership stability, interaction frequency, and clear communication processes will all help to facilitate such a climate.

4) Frequent team reflexivity

Team reflexivity is the extent to which team members collectively reflect on their shared objectives, processes and strategies and adapt them according to current or anticipated circumstances. Recent results have shown that ICU teams are poor at assessing their progress and performance in the assessment phase of coordination [22], suggesting that they engage in little or no team reflexivity. In another study,

nurses specifically requested post-crisis feedback sessions to discuss events related to a crisis with other healthcare professionals in order to reflect on their actions, cope with negative emotional responses and develop shared mental models within the team [25]. The current lack of team reflection in the ICU context is worrying, given that reflexivity is proposed as an overarching team process which best predicts team effectiveness [28]. Regular engagement in team reflexivity, via team meetings or 'away days', for example, would provide ICU teams with the opportunity to explicitly and critically reflect on past performance and make decisions about how to adapt their future behaviors and processes to improve the care they deliver.

Conclusion

An ad hoc grouping of intensive care staff is not in itself a 'team' and is not sufficient to enable effective teamwork and communication. Members of ICU teams require a whole host of non-technical skills if they are to operate as a cohesive and coordinated unit, and in turn, enhance patient safety. However, such skills are frequently neglected during professional training leading to suboptimal team work and poor patient outcomes. The hierarchical nature of the ICU team, also acts against the inclusive, collaborative and participative practices. Further research is urgently needed to more closely examine the facilitators and barriers to effective ICU team work, and the implications these have for team training and interventions. We suggest that an organizational psychology perspective will provide a valuable lens for achieving this.

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