

Resuscitation Team Members 'Experiences of Teamwork: A Qualitative Study

Abstract

Background: Despite the obvious importance of teamwork in emergency care, the dimensions of teamwork in resuscitation remain a subject of debate among specialists and researchers. The aim of this study was to identify the dimensions of teamwork based on the experiences of members of the resuscitation team. **Materials and Methods:** This study was conducted between March 2020 and April 2021. By purposive sampling, participants were selected. Sixteen semi-structured interviews were conducted with experienced emergency nurses and emergency medicine residents individually and analysed through deductive content analysis by using the Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS) model. Interviews were encoded for analysis using MAXQDA software (version 2020). **Results:** Three main categories were identified around teamwork in resuscitation. These categories were as follows (1) leadership, (2) teamwork, and (3) essential prerequisites for resuscitation. The main leadership category consisted of three sub-categories of time management, resource allocation, and task management. From sub-categories, situation monitoring, communication, and mutual support, the main category of teamwork emerged. Also, the emerging category of essential prerequisites for regeneration included two generic categories: professional requirements and workplace requirements and the teamwork category included situation monitoring, communication, and mutual support. **Conclusions:** Based on the experiences of the resuscitation team members, leadership, teamwork, and essential prerequisites for resuscitation are the most important dimensions of teamwork in resuscitation. Recognizing the dimensions of teamwork in resuscitation is an initial step and then should be reflected in educational programs and future guidelines.

Keywords: Crew resource management, healthcare, qualitative research, resuscitation, patient safety

Introduction

There is now a growing awareness in health care systems to strengthen nontechnical skills. Crew Resource Management (CRM) principles and the Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS) model have been used for years as valuable guides for researchers and medical professionals to make methods, procedures, and processes more effective and to improve the quality of patient care and safety.^[1,2] It is recommended that when applying these models in a new field, a suitable model should be created taking into account the specific requirements of that team.^[3] Teamwork models adapted from other areas can provide a useful framework for understanding team needs. However, when using interventions to improve teamwork,

the model should meet the specific requirements of that team, team tasks, and the environment.^[4]

Teamwork is a concept that is generally understood but difficult to define.^[5] Teamwork, by definition, consists of a set of behaviors, actions, cognitions, and attitudes related to a task that must be completed.^[6] Working in a team does not necessarily mean working as a team.^[7] Teamwork is a process that aims to facilitate team members' interactions through effective communication, collaboration, and coordination to successfully develop work and develop high-quality relationships between members.^[8]

Training and practicing teamwork skills improve the performance of nurses and physicians of the resuscitation team.^[9] To improve teamwork, it is necessary to have empirical knowledge about its

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Access this article online

Website: www.ijnmrjournal.net

DOI: 10.4103/ijnmr.ijnmr_294_21

Quick Response Code:



How to cite this article: Hosseini M, Heydari A, Reihani H, Kareshki H. Resuscitation team members 'experiences of teamwork: A qualitative study. Iran J Nurs Midwifery Res 2022;27:439-45.

Submitted: 23-Sep-2021. **Revised:** 21-Dec-2021.

Accepted: 06-Mar-2022. **Published:** 14-Sep-2022.

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underlying features, which is lacking. On the other hand, teamwork in various settings can be different, so studying teamwork in different settings and cultures is important.^[10] Poor teamwork is responsible for almost 40% of medical malpractice cases.^[11] With an increasing emphasis on the need for nontechnical skills alongside technical skills, medical professionals and researchers have developed tools related to non-technical skills in their area of expertise, modeled on efforts in the aviation industry.

Teamwork is one of the four main categories of Anaesthetists' Non-Technical Skills (ANTS) (task management, teamwork, situational awareness, and decision making).^[12] One of the tools for examining nontechnical skills in resuscitation is the Observational Skill-based Clinical Assessment tool for Resuscitation (OSCAR) questionnaire. Six teamwork-related behaviors are examined in this tool: communication, collaboration, monitoring/situational awareness, leadership, and decision making.^[13] The Team Emergency Assessment Measure (TEAM) tool is one of the few tools related to teamwork in cardiopulmonary resuscitation that has been designed and validated to measure the performance of emergency team members. The TEAM questionnaire includes leadership, teamwork, task management, and an overall score.^[14] According to the results of a review study by Valentine *et al.* (2015),^[15] the TEAM questionnaire, unlike most teamwork assessment tools, has good psychometric properties. However, both TEAM and OSCAR tools are based on the results of the scientific work in the simulated environments, and it will be difficult to translate these results into the real environment. Having a specific timing and order of events in a simulated situation is different from having uncertain events and situations in the real environment, and this may affect the reliability of these tools.^[13]

TeamSTEPPS model (a modelled program) is one of the well-known and popular programs to improve the team and clinical performance in the health care system.^[16] This model helps to inform team members of gaps in communication and teamwork.^[17] This model is based on team structure and four teachable learning skills that include communication, leadership, situation monitoring, and mutual support.^[18] In one study, nurses' experiences of nontechnical skills in the emergency department were examined. The two themes of this study were team composition and resuscitation leadership.^[19]

With the changing, complex, emergency, and sometimes uncertain circumstances that resuscitation team members often face in emergency departments and resuscitation cases, the importance of teamwork becomes even more apparent. Knowing the experience of resuscitation team members about the concept of teamwork provides a valuable source of information. To the best of our knowledge, there is no study examining the experiences of resuscitation team members about teamwork in resuscitation. This study,

therefore, aims to identify the dimensions of teamwork based on the experiences of members of the resuscitation team.

Materials and Methods

This qualitative study was extracted from a Ph.D. dissertation in Nursing and explored resuscitation team members' experiences with teamwork in resuscitation. This study was conducted between March 2020 and April 2021 in the Edalatian Emergency Department, Imam Reza Hospital, Mashhad, Iran. The deductive content analysis method was used. Sixteen members of the emergency resuscitation team, including nurses (n = 13), emergency medicine residents (n = 3), were selected by using purposive sampling. Participants included members of the resuscitation team in the resuscitation department who were willing to cooperate and participate in the interview. Interviews were not conducted with nurses working in other emergency departments who did not have sufficient experience in participating in resuscitation and were replaced by a resuscitation team nurse as necessary.

The data were collected via face-to-face, semi-structured interviews by the first author (MH) using a guide that included open-ended questions with a focus on teamwork in resuscitation, including targeted questions on the main categories of the TeamSTEPPS model [Table 1].

Interviews continued until data saturation (no new information was provided by interviewees) was reached. The interviews were recorded as audio and transcribed immediately after each interview session. The mean duration of the interviews was 40.31 (SD = 9.79) min.

The collected data during the interviews of the resuscitation team were analyzed using the qualitative content analysis method suggested by Elo and Kyngäs (2008) with a

Table 1: Open-ended questions with a focus on teamwork in resuscitation

Topic	questions
Experiences of participating in resuscitation	1. Please describe one of the successful or unsuccessful resuscitations in which you participated and which you remember well. 2. What characteristics should the members of the resuscitation team have to be able to do the resuscitation work well?
Leadership	With the experience you gained, how does the leader of the resuscitation team lead the team?
Communication	How do team members communicate with each other during resuscitation?
Situation monitoring	How do you know that a team member is in control of the situation and is aware of everything that is happening?
Mutual support	How do team members support each other during resuscitation?

deductive approach, which consisted of preparation, organization, and reporting phases, respectively. After transcribing the interviews, the interviews were read several times to allow immersion into the data. In the organization phase, the researchers developed a structured analysis matrix for the data analysis according to the context of the findings and the TeamSTEPPS categories. Transcripts were read and reviewed several times in search of content related to the predetermined main categories of the TeamSTEPPS (communication, leadership, situation monitoring, mutual support). Preliminary codes were then assigned to the relevant meaning units. Codes were assigned to meaning units that were not directly related to the TeamSTEPPS categories but influenced or were related to teamwork in the resuscitation. Then in an inductive approach, the grouping, categorization, and abstraction were fulfilled until generic categories emerged. Codes not related to the main categories of the TeamSTEPPS create a new category by forming an unstructured analysis matrix.

Criteria of credibility, confirmability, transferability, and dependability were used to enhance the study's rigor.^[20] Credibility was assured by researcher's long-term engagement period (13-months) in the research setting. By peer checking and member checking, data accuracy was verified and an external auditor verified the interpretation of findings. Confirmability was satisfied by using the supplementary opinions of experts in the field of qualitative research as well as a detailed and specific report of the research process. Also, transferability was achieved by accurately describing the study steps, the model (TeamSTEPPS) used to guide the qualitative content analysis, and the method used. Moreover, Dependability was ensured by continuous comparative analysis of the findings.

Ethical considerations

Ethical approval was obtained from the regional ethics committee affiliated with Mashhad University of Medical Sciences, Mashhad, Iran (decree number: IR.MUMS.REC.1398.285). While providing adequate explanations to the participants about the purpose and method of study, they were assured of confidentiality. A written and informed consent form was also signed by participants who willingly agreed to participate in this study.

Results

Of the 16 participants, 9 were female. The means of their age, total work experience, and work experience in the emergency department were 32.88 (standard deviation [SD] = 2.78) years, 5.95 (SD = 3.78) years, and 2.06 (SD = 2.80) years, respectively. The general characteristics of the participants are shown in Table 2.

After placing the generic categories corresponding to the main categories of the TeamSTEPPS, a new main

Table 2: General characteristics of the participants

No	Gender	Age	Level of education	Work experience in other departments (years)	Work experience in resuscitation department (year)
1	Male	35	Bachelor of Nursing	0	6
2	Female	35	Bachelor of Nursing	10	3
3	Female	31	Bachelor of Nursing	4	4
4	Male	33	Bachelor of Nursing	3	5
5	Male	36	Master of Nursing	3	1
6	Female	34	Bachelor of Nursing	6	2
7	Female	36	Bachelor of Nursing	2	10
8	Female	33	Bachelor of Nursing	3	3
9	Female	30	Bachelor of Nursing	1	4
10	Male	37	Emergency Medicine Resident	0	17
11	Male	28	Bachelor of Nursing	0	6
12	Male	34	Bachelor of Nursing	0	8
13	Female	33	Emergency Medicine Resident	0	6
14	Male	28	Master of Nursing	0	8
15	Female	33	Bachelor of Nursing	1	7
16	Male	30	Emergency Medicine Resident	0	5

category entitled “essential prerequisites for resuscitation” emerged from the remaining generic categories. Situation monitoring, communication, and mutual support categories from the TeamSTEPPS model were placed in the main category of teamwork as generic categories. Leadership and the essential prerequisites for resuscitation formed the other two main categories [Table 3].

Teamwork

Based on participants' experience, teamwork includes situation monitoring, communication, and mutual support. In other words, it refers to the activities of the resuscitation team members who work closely to monitor the situation and establish appropriate interpersonal communication and mutual support to maintain the patient's life. The outcome of these three key activities to preserve the patient's life promotes teamwork in resuscitation.

Table 3: Teamwork categories in resuscitation

Main categories	Generic categories
Teamwork	Situation monitoring communication Mutual support
leadership	Time management Resource allocation Task management
essential prerequisites for resuscitation	Professional requirements Workplace requirements

Situation monitoring

In situation monitoring, team members monitor other members, equipment, and progress toward the goal, and there is cross-monitoring between them. The experiences of the resuscitation team members show that progress towards a successful resuscitation is possible with cross-monitoring of the team members' performance and precise monitoring of the equipment. This will help prevent medical errors and keep the patient safe if members are paying attention to what others are doing or the devices are working properly at the same time: *"I am in charge of the patient's breathing and my colleague is giving medication, but he is not paying attention to the patient's IV leak. I will inform him immediately"* (Participant 8, Female, 33 yrs).

"It has happened many times that the patient is given an Ambu bag but no oxygen is connected to it or the oxygen interface is connected but the oxygen flow is not established and I remind them" (Participant 14, Male, 28 yrs).

"Many times I have checked that the laryngoscope light is suitable, there are one or two suction devices ready for work. This helps make it no longer necessary to send someone to bring the suction device or battery for the laryngoscope during resuscitation" (Participant 16, Male, 30 yrs).

Communication

Based on the participants' experiences, effective communication includes correct communication between members, observing the nature of the message, proper feedback to the commands, and coordination are the key elements. If there is good communication between the team leader and the members, i.e., conveying clear, concise, and short messages, receiving appropriate feedback, coordination in the team will be facilitated and as a result, teamwork will be improved. Proper communication during resuscitation is the key to building coordination between members: *"One is taking an IV and saying I am doing it, another is saying I am doing a patient catheterization, one is telling you to take a blood sample for testing, another is giving the patient an epinephrine injection, He says guys, I injected a third so that no one would inject again by mistake"* (Participant 4, Male, 33 yrs).

Mutual support

In mutual support, team members offer "suggestions for maintaining patient safety" while maintaining "mutual trust" and maintaining "mutual empowerment" in a "collaborative atmosphere." According to the experiences of the resuscitation team members, the cooperation between team members, along with mutual trust and providing suggestions for maintaining the patient's safety, preserves the strength and energy of the members and improves teamwork: *"My co-worker says my hand hurts, my foot hurts, my back hurts, it is not correct to say that I am responsible for drugs and I have nothing to do with anyone. We try to put less pressure on our co-workers by moving the roles so that he is not harmed or tired"* (Participant 14, Male, 28 yrs).

"When you trust your co-worker's work, you will be 100% less tired and you will not have to worry about checking or doing her work when resuscitation begins" (Participant 2, Female, 35 yrs).

"For example, you see your co-worker's giving a cardiac massage, but the depth or the rate is not correct, you tell her to improve the depth or rate" (Participant 14, Male, 28 yrs).

"As far as possible, you should not waste the energy of a resuscitation team member for any unnecessary work" (Participant 3, Female, 31 yrs).

Leadership

Based on the experiences of the resuscitation team members, the most important roles of the team leader are time management, resource allocation, and task management.

Time management

The team leader performs his role with respect to time management. In other words, the leader, while constantly attending to the patient's bedside, also pays attention to the golden time and prevents wasting time: *"The important thing is that the team leader should be available and have a constant presence in the department and we should not have to find him in resuscitation conditions"* (Participant 7, Female, 36 yrs).

Resource allocation

The team leader uses human resources and equipment to facilitate the work while clarifying the duties of the members: *"If the leader determines during resuscitation who should intubate, when to massage, when to go for monitoring, and when to take medication, it means that it is clear what his/her job is, they will get results much sooner"* (Participant 11, Male, 28 yrs).

"If there is a situation where one of the members is not able to do her job properly, the leader will take action by moving the members, getting help from free nurses outside

the team, or even he will even do practical work under certain circumstances (Participant 13, Female, 33 yrs).

Task management

In task management, leadership focuses on adhering to standards and guidelines and monitoring and modifying treatment plans: *"The team leader must pay attention to the patient's monitoring and know what the patient's new condition is, what needs to be done and be aware of each step of the resuscitation process"* (Participant 13, Female, 33 yrs).

"The condition of the patient who has been triaged as level 1 may have changed to level 2 depending on the treatment measures or level 2 may have reached level 3. The team leader must be aware of the condition of his patients and know what instructions have been given for each of them and what results have been achieved" (Participant 7, Female, 36 yrs).

Essential Prerequisites for Resuscitation

In this study, a new main category emerged entitled "Essential Prerequisites for Resuscitation." These prerequisites include "professional requirements" and "workplace requirements."

Professional requirements

The team leader and other members must have professional requirements, that is, in addition to having appropriate personal characteristics and ethics, they must also have a high level of scientific literacy and technical skills: *"The person who becomes a member of the resuscitation team should be familiar with all algorithms: AHA, ACLS, or BLS and all content and topics related to resuscitation, such as medications"* (Participant 10, Male, 37 yrs).

"We have a nurse who has 10 years of experience but does not know what to do in stressful situations, she cannot manage her stress. In other words, she must be able to work in this field" (Participant 9, Female, 30 yrs).

"We have members who at first try are successful to insert IV cannula for a patient with weak blood vessels. This is not a one-time event and is the result of a high level of clinical experience" (Participant 11, Male, 28 yrs).

Workplace requirements

Environmental conditions have also affected teamwork in resuscitation, factors such as guard support, appropriate work atmosphere, standard team composition, resuscitation room features, and the existence of a support system in the department, based on participants' experiences, are the most important factors influencing teamwork in resuscitation: *"In resuscitation situations, it is important for the guard to have an effective presence, to calm the atmosphere, to know when and what to do so that the energy of the resuscitation team member is not wasted"* (Participant 9, Female, 30 yrs).

"The number of team members should not be too much because teamwork will be disrupted. That means we have to consider the minimum number of people, the team leader, the person in charge of the airway, one person for the intravenous route, the person in charge of injecting drugs, and one person for monitoring the patient, that is, a maximum of 5 people for the non- COVID-19 patients is enough" (Participant 10, Male, 37 yrs).

"We see that when a new member is added to the team, he performs very well for the first month or two, despite many resuscitations. But when she sees that there are no incentives, she gradually loses motivation to work" (Participant 15, Female, 33 yrs).

Discussion

Despite identifying a large number of nontechnical skills that affect team performance, the type and number of key components affecting teamwork in resuscitation are still unclear. Analysis of the experiences of the resuscitation team members about teamwork showed that teamwork in resuscitation has various and wide dimensions, and this is a complex concept. Due to the social nature of communication concepts, mutual support and situation monitoring as generic categories were placed in the main category of teamwork, and leadership is considered a separate main category due to its high importance, relatively independent nature, and wider scope of tasks.

Similar to the results of our study, Cooper *et al.* (2010)^[14] in their TEAM questionnaire also listed leadership as an independent category; But in ANTS questionnaire does not refer to the leadership category. These similarities and differences show that the role and importance of nontechnical skills are entirely dependent on settings. In one setting, leadership is considered an important skill and is placed in the main category,^[14] and in another setting, it is not as important.^[12] In the same way, examples can be given for other nontechnical skills. Therefore, it seems advisable that when measuring behavioral skills, we should pay special attention to the effect of setting on the required behavioral skills.

Despite the belief in the impact of cultural and environmental factors on behaviors and teamwork,^[21] It seems the size of this impact is also completely dependent on settings. That is, in a single setting (resuscitation), a very important category such as leadership is placed as the main category between the TEAM and OSCAR tools,^[14,22] as well as in the present study (regardless of different environment and culture). Also, considering the two tools mentioned and the present study, we find that the importance of nontechnical skills in a single setting is not the same and can be changeable in different cultures, so some generic skills and others are considered as the main categories. Accordingly, the newly emerged category, essential prerequisites for resuscitation, which reflects

the experiences of resuscitation team members as factors influencing teamwork in resuscitation, seems to be more correspond to similar tasks and cultural conditions.

To the best of our knowledge, no study has been examined the experiences of resuscitation team members about teamwork, and discussing other nontechnical skills does not help much. Given that the main concepts of the TeamSTEPPS model were used as a guide to qualitative content analysis in this study and covered many of the experiences of the resuscitation team members, it is suggested that in future studies and similar settings, researchers use the concepts of this model as a guide to qualitative content analysis.

All nontechnical skills in the OSCAR questionnaire including decision making, leadership, coordination, collaboration, and communication, and three non-technical skills of the TEAM questionnaire including leadership and teamwork, and task management were emphasized in the experiences of resuscitation team members in the present study. Considering the different environmental and cultural aspects between the present study and the above two studies, the different methodology in the present study, as well as the different composition and number of resuscitation team members between the studies, the discrepancies between the results of those studies and the present study in different categories or different emphases on a particular category are understandable. It is suggested that researchers conduct more studies to clarify the dimensions of teamwork in resuscitation in other similar settings such as prehospital resuscitation, resuscitation of infants, children, or traumatized patients.

One of the strengths of this study is the use of the experience of experienced nurses and resuscitation team residents about teamwork that we believe was done for the first time. Other strengths of this study are the use of guided qualitative content analysis and the selection of the TEAM model steps as a working guide. For the convenience of the participants, after the necessary coordination, a quiet room adjacent to the resuscitation room was considered for the interview, which in a few cases the interviews were interrupted due to the need for the interviewee to respond to his coworkers, which is the limitation of this study.

Conclusion

Based on the experiences of the resuscitation team members, the leader of the resuscitation team must have sufficient skills in time management, resource allocation, and task management, also the team members must communicate appropriately, have mutual support, and pay close attention to situation monitoring. Moreover, professional requirements and workplace requirements, as sub-categories of the "necessary prerequisites for resuscitation," also play an important role in teamwork in resuscitation.

Acknowledgments

This study was written as a part of the Ph.D. dissertation in nursing, which was registered at Mashhad University of Medical Sciences with code No. of 981118. The authors would like to thank all of the participants for taking part in this study and sharing their experiences.

Financial support and sponsorship

Deputy of Research and Technology of Mashhad University of Medical Sciences

Conflicts of interest

Nothing to declare.

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