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RESEARCH

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Identifying teamwork-related needs of the medical emergency team: Nurses' perspectives

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Abstract

Background: The role of medical emergency team (MET) in managing deteriorating patients and enhancing patient safety is greatly affected by teamwork.

Aims: To identify teamwork-related needs of the MET from MET nurses' perspectives. To assess the associations between MET nurses' perceptions of teamwork and their work experience and education.

Study design: A quantitative, descriptive correlational design.

Methods: Registered intensive care unit (ICU) nurses (n = 50) who were members of the MET in an acute tertiary care hospital answered a modified version of the team assessment questionnaire in 2017. Data were analysed using descriptive statistics, the Kruskal-Wallis test, and the univariate analysis of variance method. The reporting of this study adheres to the strengthening the reporting of observational studies (STROBE) guidelines.

Results: Participants showed least agreement with the items presenting leadership skills (mean = 2.6, SD = 0.68). Approximately 50% nurses disagreed that the MET had adequate resources, training, and skills. The majority of nurses (80%) felt that their responsibilities as a MET member interfered with taking care of their own ICU patients. Many nurses (64%) felt that they did not have a voice in MET's decision-making process. Approximately 50% nurses felt that they were not recognized for their individual contribution, and they were uncertain regarding MET's policies for dealing with conflicts. The amounts of MET nurses' work experience and education were associated with MET skills and function, respectively.

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Conclusion: Key teamwork elements of the MET that need improvements include decision-making and conflict resolution skills, valuing team members, and team leadership. Practicing shared mental models, implementing the TeamSTEPPS curricula at hospitals for training ICU nurses, and simulation-based team-training programmes may be beneficial in improving teamwork of MET members.

Relevance to clinical practice: This study revealed key teamwork elements of the MET that need improvements. Our findings may contribute to improve teamwork, thereby optimizing MET function, and enhancing patient outcomes.

KEYWORDS

communication, competence, medical emergency team, non-technical skills, teamwork

1 | INTRODUCTION

The medical emergency team (MET) is a specialized interprofessional team that delivers critical care to deteriorating non-critical care patients.[1] The MET is responsible for reducing the number of adverse outcomes in patients such as death and cardiac arrest.[2] The quality of MET performance is greatly influenced by team's non-technical skills,[3] defined as a combination of social (teamwork and communication) and cognitive (analytical and personal behaviour) skills, resulting in the safe delivery of high-quality, efficient, and effective interprofessional care.[4] The fundamental teamwork and communication elements, required for efficient interprofessional collaborations in health care services, are identified as adaptability, coordination, conflict resolution skills, and shared leadership.[5] Importantly, teamwork and communication are essential for successful and effective MET performance.[3,6]

Evidence indicates that verbal communication failures among health care professionals, including communication failures occurring during handling of patients in emergency situations, are common root causes of patient safety incidents.[7] Therefore, the practice of shared mental models is suggested to bring a common situation awareness and knowledge among MET members, thereby facilitating decision-making process, communication, and teamwork.[8,9] The concept of shared mental models in health care collaborations is defined as the knowledge structure of an individual that facilitates effective collaboration among team members.[10]

Efficient teamwork has a positive influence on MET performance, thereby enhancing patient safety.[11] However, evidence indicates that the quality of MET members' non-technical skills (such as teamwork and communication) is suboptimal and requires improvements.[12] Therefore, collecting team performance data is recommended for the advancement of teamwork in health care. Of note, it is possible to validly measure and systematically improve the performance and teamwork of the MET.[5]

What is known about this topic

- MET's role in managing deteriorating patients and enhancing patient safety is greatly affected by teamwork.

What this paper adds

- Based on the nurses' perspectives, this study revealed key teamwork elements of the MET that need improvements.
- Our findings may contribute to improve teamwork, thereby optimizing MET function and enhancing patient outcomes.

1.1 | Background

The conceptual framework of this study is based on the "nurses' competence" theory, defined as the integration of knowledge, skills, attitudes, thinking ability, and values.[13,14] More specifically, we focused on the teamwork defined by the "Team Strategies and Tools to Enhance Performance and Patient Safety" (TeamSTEPPS) programme.

In the 1999 Institute of Medicine report, "To err is human: Building a safer health system", the importance of patient safety was reemphasized.[15] Consequently, to enhance teamwork in health care, the TeamSTEPPS programme was developed by the "Agency for Healthcare Research and Quality" and "Department of Defense" in 2006 as a part of the patient safety movement. The TeamSTEPPS programme offers evidence-based as well as standard team training curricula to improve patient outcomes by enhancing teamwork-related performance of health care professionals.[3] The curricula have been used to train registered intensive care unit (ICU) nurses who work as members of the MET in health care settings and identified as beneficial to MET function.[16]

The MET is a multiprofessional team usually composed of registered ICU nurses and an ICU physician, an anaesthetist doctor, or a respiratory therapist. Hence, different clinicians with the shared goal of managing deteriorating patients come together to work as a MET. Although MET members' knowledge, skills, attitudes, and work experiences vary across disciplines,[17] the interrelationships between their knowledge, skills, and attitudes are critical for the purposeful improvement of teamwork, resulting in effective team performance and enhanced patient safety.[3] A

vital step in improving teamwork of MET members is continuous assessment and measurement of team performance, which is essential for developing members' knowledge of efficient teamwork, improving their teamwork and communication skills, and strengthening their attitudes towards teamwork.[3,5] However, there is little research exploring teamwork interactions among MET members. Therefore, in this study, we focused on determining teamwork-related needs of the MET by measuring teamwork and communication from MET nurses' perspectives.

1.2 | Aims

The aim of this study was to identify teamwork and communication-related needs of the MET from MET nurses' perspectives. Additionally, we assessed the correlation between MET nurses' perception of teamwork and communication and their work experience and education. This study answered the following research questions:

1. How do MET nurses perceive teamwork and intra-team communication?
2. Are there any associations between MET nurses' perception of teamwork and communication and their work experience and education?

2 | METHODS

2.1 | Study design

A quantitative, descriptive correlational design was adopted for conducting this study.

2.2 | Study setting

The study was conducted in an acute tertiary care hospital, which is one of the five university teaching hospitals in Finland and accommodates 569 beds. The MET has been actively implemented and promoted at the hospital since 2010. The MET is located in the ICU ward and ICU nurses who are members of MET are On-Call for MET events (in addition participating in ICU patient care). Criteria for MET membership by ICU nurses include a minimum of 2 years of ICU experience, completion of an annual organizational Resuscitation course, and completion of an "Advanced Life Support" course, including theory and simulation scenarios. The MET is composed of one or two registered ICU nurses (based on the demand) and one ICU physician (team leader). MET members are responsible for responding to the needs of the deteriorating patients within the hospital.

2.3 | Participants

Registered ICU nurses who were members of the MET were included in this study.

2.4 | Data collection

A modified version of the team assessment questionnaire (TAQ) was used to evaluate teamwork and communication within the MET from MET nurses' perspectives. Originally, the TAQ was developed as a part of the TeamSTEPPS programme to measure teamwork and communication in health care environments. Beebe et al modified and tailored the TAQ to measure teamwork within the MET, which is a specialized short-term care team.[18] Consequently, the items referring to long-term care teams were eliminated, and the term "boss/supervisor" was replaced with the term "team leader".[18]

Of note, the TeamSTEPPS programme has developed several questionnaires to measure team performance among emergency teams. The questionnaires were developed based on the core concepts of teamwork including team structure, leadership, communication, situation monitoring, and mutual support. According to the TeamSTEPP's theoretical framework, competency in the core teamwork concepts would be demonstrated in the attitude, performance, and knowledge of the team.[3] Hence, all of them can be used for measuring teamwork in emergency teams. However, the TAQ was used for this study because it has been used in a study by Beebe et al[18] to assess teamwork in MET.

The modified TAQ questionnaire had 43 items categorized into seven main domains, covering critical aspects of teamwork assessment in the MET, such as team foundation (10 items), team function (4 items), team performance (3 items), team skills (6 items), team leadership (5 items), team climate or atmosphere (8 items), and team identity (7 items). The items were presented on a five-point Likert scale, ranging from strongly agree (strongly agree = 1) to strongly disagree (strongly disagree = 5). Participants were asked to rate the items based on their perceptions of the MET.

Additionally, six demographic questions were added to the questionnaire regarding participants' age, sex, years of work experience as a registered nurse, years of work experience as an MET member in the ICU, MET education and training received by them, and the institute responsible for providing MET education and training.

2.5 | Ethical considerations

This study was approved by the ethical committees of the university and hospital (Statement 11/2016) and was conducted based on the Helsinki Declaration and General Data Protection Regulations (EU 2016/679). The TeamSTEPPS tools are free to use[3]; however, the permission to use the modified version of the TAQ for MET was obtained from Beebe et al.[18] The reporting of this study adheres to the strengthening the reporting of observational studies (STROBE) guidelines.[19]

2.6 | Participant recruitment

Following an initial meeting between the researchers and ICU nurse manager, the questionnaires, information sheets, envelopes, and a dedicated box for data collection were provided to the nurse manager.

Registered ICU nurses who met the inclusion criteria were approached by the nurse manager and were informed about the study. Physicians who were members of MET were also invited to the study, but only three responses were received. Consequently, physicians were disregarded from the study. Participation in the study was voluntary, and participants were supplied with an information sheet about the study. Data were collected in May 2017 and anonymized.

2.7 | Data analysis

Data were analysed using IBM SPSS Statistics 23.0. Numerical values were assigned to participants' responses to the TAQ items (strongly agree = 1, agree = 2, undecided = 3, disagree = 4, and strongly disagree = 5). Descriptive statistics, including frequencies, percentages, means, and SDs, were used to assess participants' demographic information and responses. The responses to items in each domain of the questionnaire were expressed as mean ± SD.

TABLE 1 Sample characteristics

Items		ICU nurses
Sample size (n)		89
Respondents (n)		50
Response rate %		56%
Sex		
Female	n (%)	37 (74%)
Male	n (%)	13 (26%)
Age (year)		
26-35	n (%)	15 (30%)
36-45	n (%)	19 (38%)
46-55	n (%)	9 (18%)
≥56	n (%)	7 (14%)
Work experience (year)		
1-2	n (%)	1 (2%)
3-5	n (%)	6 (12%)
6-10	n (%)	10 (20%)
11-20	n (%)	15 (30%)
≥20	n (%)	18 (36%)
Work experience as a MET member (year)		
<1	n (%)	2 (4%)
1-2	n (%)	6 (12%)
3-5	n (%)	23 (46%)
6-10	n (%)	19 (38%)
MET education and training received by them (year)		
<1	n (%)	32 (64%)
1-2	n (%)	8 (16%)
3-5	n (%)	4 (8%)
≥6	n (%)	6 (12%)

Abbreviations: ICU, intensive care unit; MET, medical emergency team.

Variables were computed based on the mean score in each domain, allowing us to assess the mean score in each domain separately. The Kruskal-Wallis test was used to assess the influence of MET nurses' demographic variables including work experience and education on their responses to the TAQ domains. Consequently, the univariate analysis of variance method was used to study associations between significant domains, such as team function and team skills, and possible predictors, such as work experience as MET member and MET education. Pairwise comparisons were also conducted. A *P*-value of ≤.05 was set to indicate significant results.

The internal consistency among items was calculated, and we observed a good overall Cronbach's alpha (0.948). Cronbach's alpha was calculated for each domain separately, and a Cronbach's alpha ≥0.7 was observed in six out of seven domains (team performance domain: Cronbach's alpha <0.7). The low value of Cronbach's alpha in team performance domain could be attributed to the fact that this domain consisted of only three items. Nevertheless, considering the high overall Cronbach's alpha among all the items, the authors decided to retain team performance domain.

2.8 | Validity, reliability, and rigour

The TAQ tool was developed based on an evidence-based standard team training programme (TeamSTEPPS) to promote patient safety in health care. To the best of our knowledge, there are no published data showing the validity or reliability of the tool. Nonetheless, the modified TAQ tool, which was used in a study conducted in the United States,[18] showed good internal consistency among the items, similar to our study.

3 | RESULTS

3.1 | Sample characteristics

Of 89 registered ICU nurses, 50 responded to the questionnaire (response rate = 56%). Participants were mostly female (74%). Most participants were within age range of 36 to 45 years (38%), and 30% participants were between 26 and 35 years. More than half of the participants (66%) had more than 11 years of work experience as a registered nurse. Most of the participants (84%) had more than 3 years of work experience as a registered ICU nurse working in the MET; the majority of them (46%) had 3 to 5 years of work experience as a MET member. According to the majority of participants (80%), the estimated duration of their overall MET education and training was ≤2 years. Nearly all participants (90%) received MET education and training through in-service education programme at the hospital (Table 1).

3.2 | Teamwork and communication within the MET

Overall, participants agreed with all the domains of teamwork stated in the questionnaire, with a mean score ranging from 2.0 to 2.6 and

TABLE 2 Domains and items of the team assessment questionnaire

Item	n (%)					Mean (SD)
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	
Team identity						2.03 (0.51)
The team is safety net for patients.	22 (44%)	22 (44%)	5 (10%)	1 (2%)	0	1.70 (0.73)
I know why I am on a team.	18 (36%)	26 (52%)	5 (10%)	1 (2%)	0	1.78 (0.70)
This team is fun to work with.	13 (26%)	31 (62%)	6 (12%)	0	0	1.86 (0.60)
I am pleased to be on a team.	16 (32%)	22 (44%)	8 (16%)	4 (8%)	0	2.00 (0.90)
The team subscribes to a clear set of values.	11 (22%)	27 (54%)	7 (14%)	5 (10%)	0	2.12 (0.87)
The team recognizes the patient as a critical team member.	10 (20%)	24 (48%)	12 (24%)	4 (8%)	0	2.20 (0.85)
I am a member of a team in which the leader promotes teamwork.	6 (12%)	14 (28%)	26 (52%)	3 (6%)	1 (2%)	2.58 (0.85)
Team functioning						2.20 (0.64)
The goals and objectives of this team will have positive impact on the hospital.	17 (34%)	27 (54%)	6 (12%)	0	0	1.78 (0.64)
This team works well together.	12 (24%)	27 (54%)	7 (14%)	4 (8%)	0	2.06 (0.84)
The team is on a continuous improvement curve.	11 (22.4%)	22 (44.9%)	10 (20.4%)	6 (12.2%)	0	2.22 (0.94)
Everyone on the team participates at an acceptable level.	4 (8%)	21 (42%)	10 (20%)	13 (26%)	2 (4%)	2.76 (1.06)
Team skills						2.22 (0.59)
The team can change or improve the way it goes about working on its tasks.	14 (28%)	26 (52%)	8 (16%)	2 (4%)	0	1.96 (0.78)
Team members are familiar with each other's job responsibilities.	14 (28%)	27 (54%)	5 (10%)	4 (8%)	0	1.98 (0.84)
The team members communicate well with one another.	8 (16%)	32 (64%)	6 (12%)	3 (6%)	1 (2%)	2.14 (0.83)
The team uses effective decision-making processes and problem solving skills.	9 (18%)	22 (44%)	14 (28%)	5 (10%)	0	2.30 (0.88)
Constructive feedback is given by team members.	3 (6%)	30 (60%)	10 (20%)	6 (12%)	1 (2%)	2.44 (0.86)
The team monitors and progresses the plan of care.	10 (20%)	14 (28%)	17 (34%)	9 (18%)	0	2.50 (1.01)
Team foundation						2.34 (0.61)
The team has a clear vision of what it is supposed to do.	24 (48%)	23 (46%)	1 (2%)	2 (4%)	0	1.62 (0.72)
The team's activities are guided by a clear mission statement/charter.	19 (38%)	24 (48%)	2 (4%)	5 (10%)	0	1.86 (0.90)
The department or unit has clear expectations of this team.	16 (32%)	25 (50%)	8 (16%)	1 (2%)	0	1.88 (0.74)
Everyone on the team has a clear and vital role.	12 (24.5%)	31 (63.3%)	2 (4.1%)	4 (8.2%)	0	1.96 (0.78)
The team understands its customer requirements (patient and hospital).	13 (26%)	25 (50%)	10 (20%)	2 (4%)	0	2.02 (0.79)
The team's goals are closely aligned with the goals of the hospital.	15 (30%)	21 (42%)	10 (20%)	4 (8%)	0	2.06 (0.91)
The team can measure its performance effectively.	8 (16%)	11 (22%)	16 (32%)	14 (28%)	1 (2%)	2.78 (1.09)

(Continues)

TABLE 2 (Continued)

Item	n (%)					Mean (SD)
	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	
The team has adequate skills and member resources to achieve its goal.	6 (12.2%)	16 (32.7%)	5 (10.2%)	19 (38.8%)	3 (6.1%)	2.94 (1.21)
The team has adequate resources to achieve all objectives.	5 (10.2%)	13 (26.5%)	4 (8.2%)	24 (49%)	3 (6.1%)	3.14 (1.19)
The team receives adequate training to function effectively.	2 (4%)	17 (34%)	6 (12%)	22 (44%)	3 (6%)	3.14 (1.08)
Team climate or atmosphere						2.54 (0.59)
Team members trust each other.	11 (22%)	30 (60%)	5 (10%)	4 (8%)	0	2.04 (0.80)
Team members support each other.	10 (20%)	29 (58%)	7 (14%)	4 (8%)	0	2.10 (0.81)
Morale on this team is high.	11 (22%)	23 (46%)	8 (16%)	8 (16%)	0	2.26 (0.98)
I feel free to express my opinions.	8 (16%)	25 (50%)	12 (24%)	5 (10%)	0	2.28 (0.85)
The team resolves conflicts soon after they occur.	4 (8%)	13 (26%)	26 (52%)	7 (14%)	0	2.72 (0.80)
Team members show consideration for the needs and feelings of other team members.	3 (6%)	17 (34%)	17 (34%)	13 (26%)	0	2.80 (0.90)
I have an influence on team decisions.	3 (6%)	15 (30%)	19 (38%)	11 (22%)	2 (4%)	2.88 (0.96)
Team members receive recognition for individual performance.	3 (6.1%)	11 (22%)	8 (16.3%)	25 (51%)	2 (4.1%)	3.24 (1.05)
Team performance						2.56 (0.59)
The team is productive	19 (38%)	21 (42%)	7 (14%)	3 (6%)	0	1.88 (0.87)
The team meets its customer requirements (patient and hospital).	13 (26%)	24 (48%)	10 (20%)	3 (6%)	0	2.06 (0.84)
Team function does not interfere with getting my own job done.	2 (4%)	5 (10%)	3 (6%)	33 (66%)	7 (14%)	3.76 (0.96)
Team leadership						2.68 (0.68)
The team leader is an effective leader.	6 (12%)	22 (44%)	20 (40%)	2 (4%)	0	2.36 (0.74)
The team leader leads by example.	6 (12%)	23 (46%)	17 (34%)	3 (6%)	1 (2%)	2.40 (0.85)
I share my ideas/suggestions whether or not the team leader agrees with my input.	5 (10%)	20 (40%)	13 (26%)	11 (22%)	1 (2%)	2.66 (1.00)
The team leader promotes individual problem solving and intelligent risk taking.	3 (6%)	13 (26%)	23 (46%)	9 (18%)	2 (4%)	2.88 (0.91)
The team leader coaches and supports individual team members.	3 (6%)	10 (20%)	19 (38%)	15 (30%)	3 (6%)	3.01 (0.99)

Note: 1, strongly agree; 2, agree; 3, undecided; 4, disagree; 5, strongly disagree.

an SD ranging from 0.51 to 0.68. The mean score indicates good quality of teamwork within the MET, and a low SD indicates that the data are reliable and sufficiently clustered around the mean. Participants showed the most agreement with the items in team identity domain, and the least agreement with the items in team leadership domain. Table 2 presents the mean score with SD for each category and its items in detail.

Importantly, 80% nurses felt that their responsibilities as a MET member interfered with taking care of their own ICU patients, which was presented as an item in team performance domain (disagree or strongly disagree = 80%). Approximately 50% nurses disagreed or strongly disagreed with three items in team foundation domain and one item in team climate or atmosphere domain. These items were as follows: (i) MET members receive recognition for individual performance (disagree or strongly disagree = 55.1%), (ii) the MET has adequate resources to achieve all objectives (disagree or strongly disagree = 55.1%), (iii) MET members receive adequate training to function effectively (disagree or strongly disagree = 50%), and (iv) the MET has adequate skills and member resources to achieve its goal (disagree or strongly disagree = 44.9%) (Figure 1).

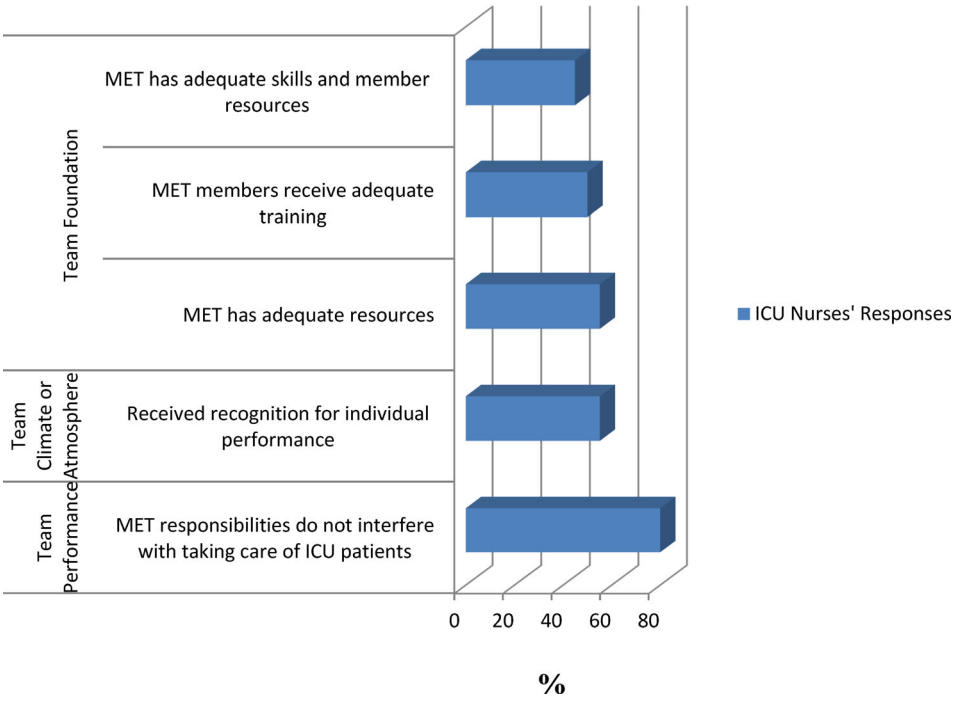

FIGURE 1 The most strongly disagreed/disagreed items of teamwork and communication domains

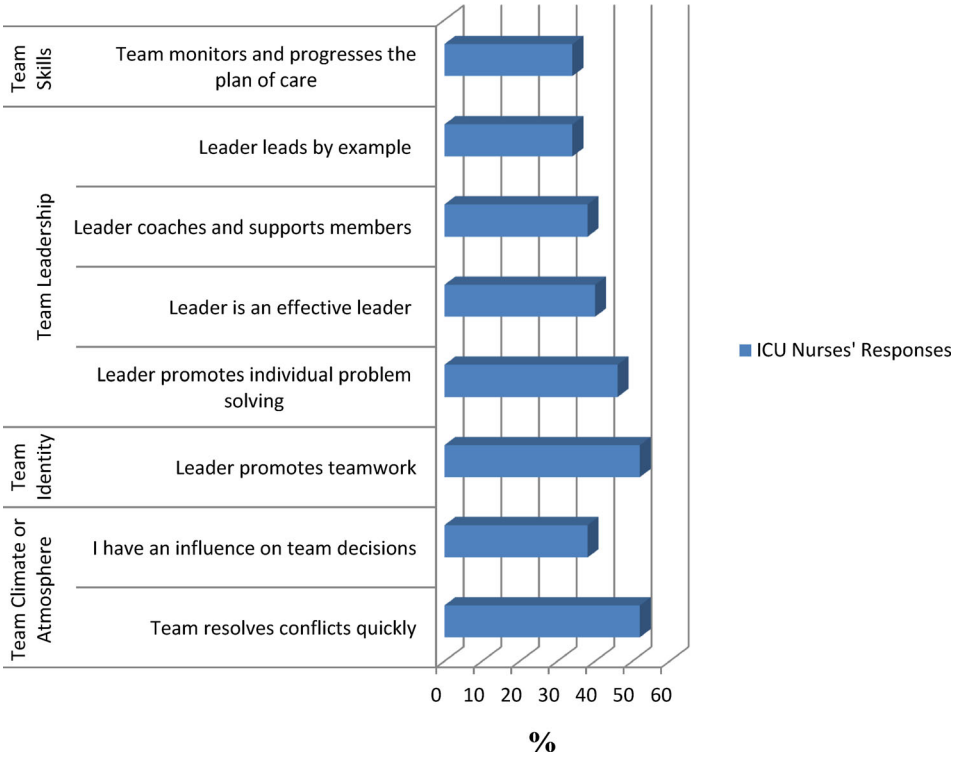

FIGURE 2 The most undecided items of teamwork and communication domains

More than half of the nurses expressed uncertainty about one item in team climate or atmosphere domain (ie, "the team resolves conflicts soon after they occur", undecided = 52%), and one item in team identity domain (ie, "I am a member of a MET in which the leader promotes teamwork", undecided = 52%). Other items about which most nurses were uncertain, such as the team leader promotes individual problem solving and intelligent risk taking (undecided = 46%), the team leader is an effective leader (undecided = 40%), the team leader coaches and supports individual team members (undecided = 38%), and the team leader leads by example (undecided = 34%), mostly belonged to team leadership domain. Additionally, 38% nurses were undecided about an item in team climate or atmosphere domain, that is, "I have an influence on team decisions". Participants also reported rather significant

TABLE 3 Characteristics between team skills and team function domains and possible predictors, such as MET nurses' work experience and education

		Team skills		Team functioning	
	Number	*M* (±SD)	*P*-value Univariate	*M* (±SD)	*P*-value Univariate
Work experience as a MET member (year)			.042[a]		
1-2	n = 8	1.83 (0.48)			
3-5	n = 22	2.42 (0.55)			
≥6	n = 20	2.15 (0.61)			
Total	n = 50	2.22 (0.59)			
MET education and training received by them (year)					.016[b,c]
<1	n = 32			2.39 (0.65)	
1-5	n = 12			1.91 (0.50)	
≥6	n = 6			1.76 (0.39)	
Total	n = 50			2.20 (0.64)	

Abbreviation: MET, medical emergency team.
[a]Difference between 1 to 2 versus 3 to 5 is significant.
[b]Difference between <1 versus 1 to 5 is significant.
[c]Difference between <1 versus ≥6 is significant.

uncertainty about an item belonged to team skills domain, that is, "the team monitors and progresses the plan of care" (undecided = 34%) (Figure 2).

3.3 | The influence of work experience and MET education on teamwork

The amount of work experience did not have a significant influence on MET nurses' teamwork and communication. However, the amount of work experience as a MET nurse demonstrated a significant impact on MET skills domain ($P = .042$). Nurses with 1 to 2 years of work experience as a MET member agreed more with items in MET skills domain compared with those with 3 to 5 years of work experience as a MET member (1.83 ± 0.48 vs 2.42 ± 0.55, $P = .042$) (Table 3). Moreover, the amount of MET education and training received by participants had a significant influence on MET function domain ($P = .016$). Nurses with less than 1 year of MET education agreed significantly less with items in MET function domain compared with those with 1 to 5 years and more than 6 years of MET education (2.39 ± 0.65 vs 1.91 ± 0.50 and 1.76 ± 0.39, $P = .016$) (Table 3).

4 | DISCUSSION

The goal of this study was to determine teamwork and communication-related needs within the MET from the MET nurses' perspectives. Based on our results, about half of the participants were quite uncertain about or disagreed with the leadership skills of the MET leader, such as employing an effective leadership style, ability to lead by example, openness to other team members' ideas, promoting team members' conflict management and problem-solving competencies, and empowering and nurturing MET members. Our results align with the results of a study conducted in the United States in which the participants expressed mixed responses about the above-mentioned MET leader's skills, where 40% of the participants either disagreed or were uncertain[18]; further, some participants were not sure about who the team leader was or if there was any team leader. For instance, in our study, a physician of the MET team was the team leader. Evidence indicates a positive association between leadership skills and the performance of emergency teams; weak leadership leads to shortcomings in the team's performance and poor clinical outcomes for patients.[20] Moreover, according to the TeamSTEPPS programme, leadership is one of the key elements in teamwork that positively influences the quality of MET performance and patient outcomes.[3] The fact that nurses working as MET members agree less with the leadership skills of MET leaders or lack clarity about team leader's identity indicates poor leadership and highlights the need for improvement in fundamental leadership tasks, including role assignment and team briefing and debriefing.[21] Conducting reflective debriefing sessions after MET events may be useful in developing leadership skills through the identification of leadership and teamwork concerns and facilitating open discussions among team members to address these concerns.[22,23] Studies also indicate that simulation-based team training programmes are beneficial in improving leadership and enhancing non-technical skills such as teamwork in medical teams.[11,12] Therefore, we recommend hospital educators as well as MET's governance and administrative structures to pay special attention to simulation-based team training programmes while planning training programmes for the professional development of the MET.

Furthermore, approximately half of the participants in our study disagreed that the MET had adequate resources, training, and skills to

achieve its goal, emphasizing a profound need to strengthen MET foundation. According to our findings, the perceptions of MET skills varied significantly among nurses with different amounts of work experience as a MET member. Nurses with more work experience as a MET member disagreed more with MET skills, including MET members' skills for improving work tasks, familiarizing themselves with teammates' job responsibilities, communication skills, decision-making and problem-solving skills, skills for providing constructive feedback, and skills for monitoring and progressing the plan of care. Hospital managers and MET's governance need to devote more human and non-human resources to the MET.[24] Due to the shortage of ICU nurses, inadequate human resources of the MET may influence the quality of care delivery.[24] This result complements our other finding regarding nurses' perception of MET responsibilities interfering with taking care of their own ICU patient. In order to address this issue, hospital managers and the department of human resources should consider assigning adequate nurses to the MET. Moreover, advancing MET, members' knowledge, technical and non-technical skills, and leadership skills have been emphasized in a current MET's recommendation for improving MET performance.[24] According to recent studies, the educational needs of ICU nurses working in the MET include learning clinical deterioration theory and skills, MET's governance, and non-technical skills such as task management, communication, professionalism, and teamwork.[25,26] We recommend hospital managers and educators to focus more on the training and education received by MET members, especially those to improve teamwork within the MET. Based on our findings, the training and education received by MET members are correlated with MET function, which was presented as having goals with a positive impact on the hospital outcomes, having a well-working team, being on a continuous improvement curve, and presenting acceptable levels of team participation among all team members. There was a significant difference in the positive perceptions of MET function among MET members with different amounts of MET education; nurses with more MET education agreed more with MET function compared to those with less than 1 year of MET education. Evidence indicates that MET members' non-technical skills substantially improve MET function and patient outcomes[27] and are quite important for MET training.[28] Therefore, we recommend implementation of the TeamSTEPPS curriculum in hospital settings for training ICU nurses working in the MET because it is a dedicated evidence-based team training programme for the MET and has extensive benefits.[16]

Based on MET nurses' responses to items in MET climate or atmosphere domain, MET nurses did not feel that they had a voice in MET's decision-making process and were not recognized for their individual contribution. Evidences suggest that shared mental models enhance the quality of MET decision-making by highlighting shared decision-making and goals as well as through both analytic and non-analytic decision-making processes, thereby enhancing MET team performance.[8] In addition, approximately half of the participants were uncertain regarding MET's policies for dealing with conflicts. Therefore, we recommend considering shared mental models in the MET. Further qualitative research is required to deepen the knowledge and understanding concerning the role of shared mental models in improving teamwork competencies of MET members.

5 | LIMITATIONS

The primary limitation of this study was using a self-report measure, which potentially might not reflect the effectiveness of team performance. Using the "Team Performance Observation Tool" (TPOT) developed by the TeamSTEPPS in addition to the questionnaire could have complemented the evaluation of team performance. However, the TPOT was not used as the study is based upon nurses' competence theory, where attitude is an essential component of nurses' competence. Another limitation was participant recruitment. As the MET is a multiprofessional team composed of both registered ICU nurses and ICU physicians, the inclusion of ICU physicians working in the MET would have enriched our findings. However, a rather large number of MET nurses (n = 50, response-rate = 56%) included in this study provided a good understanding of MET nurses' views on teamwork and communication-related needs of the MET.

5.1 | Implications and recommendations for practice

Based on the nurses' perspectives, this study revealed key teamwork elements of the MET that need improvements. Our findings may contribute to improve teamwork, thereby optimizing MET function and enhancing patient outcomes. Hospital managers as well as MET's governance and administrative structures need to be sensitive to the reasons behind deficiencies in teamwork in the MET, such as insufficient resources, training, and skills, and need to address the issues.

6 | CONCLUSION

The study revealed key teamwork and communication elements that need strengthening, including decision-making and conflict resolution skills, valuing team members, and leadership. Practicing shared mental models, implementing the TeamSTEPPS curricula in hospital settings for training ICU nurses, and simulation-based team training programmes may be beneficial in improving the teamwork of MET members.

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AUTHOR CONTRIBUTIONS

Mina Azimirad, Carin Magnusson, Allison Wiseman, Tuomas Selander, Ilkka Parviainen, Hannele Turunen: conception and design, or acquisition of data, or analysis and interpretation of data; involved in drafting the manuscript or revising it critically for important intellectual content; given final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content. All the authors agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

ETHICS STATEMENT

This study was approved by the ethical committees of the university and hospital (Statement 11/2016) and was conducted based on the Helsinki Declaration and General Data Protection Regulations (EU 2016/679). The TeamSTEPPS tools are free to use (AHRQ, 2021); however, the permission to use the modified version of the TAQ for MET was obtained from Beebe et al.[18] The reporting of this study adheres to the STROBE guidelines.[19]

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