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# Strategies For Safety: A Mixed Method Study of Communication, Teamwork and Health Professional Attitudes When Implementing Multidisciplinary Simulation in The Emergency Department

**Katie Janz, Kylie Russell**

***Abstract*** *The Emergency Department (ED) team delivers care to critically unwell patients. Within this, there are a range of complexities and responsibilities identified. Technical skills can be taught in lectures and books; however, the newly evolving phenomenon of focusing on non-technical medical skills has advanced over time. Using non-technical skills, such as communication and human factors, can influence the team's functioning, which could potentially influence a positive outcome of a critical care event. This study explores whether multidisciplinary simulation training, focusing on non-technical skills, can improve participants' communication and teamwork and if regular simulation practice can influence healthcare staff attitudes towards embedding a regular simulation program at a local site. A convergent mixed method approach was used to determine staff attitude towards a newly implemented simulation program in the hospital ED. Data was collected over six weeks. The quantitative component measured teamwork and communication with Guise's validated and reliable tool, the Clinical Teamwork Scale (CTS). Further data using a developed evaluation survey provided participant feedback pre and post-simulation. Thirty-two participants, sixteen nurses and sixteen doctors, were surveyed. The results could suggest a trend of a positive outlook towards implementing a regular simulation practice. However, further analysis would be required. A common theme was participant confidence post-simulation practice and willingness to participate in future simulations. Baseline opinions from all participants were positive. The study has generated valuable insight towards staff attitudes toward MDT simulation in the ED setting. The evidence can further support the implementation of a regular simulation program.*

***Keywords,*** *Communication and Teamwork, health professional attitudes, Multidisciplinary, Simulation Practice, Emergency Department*.

## I. INTRODUCTION

Teaching non-technical skills is now recognised as having a significant impact on healthcare. The Australian Resuscitation Council highlight the importance of teaching such skills to improve care delivery within a resuscitation environment [1]. Communication and teamwork failures have been identified as some of the preventable adverse events that can occur in the healthcare setting [2]. Simulation practice has significantly impacted human activities within a clinical environment, improving patient outcomes and reducing adverse events [3]. The importance of non-technical skills, such as the human factors of communication and teamwork within a resuscitation event, can significantly impact patient care delivery [4]. Non-technical skills such as teamwork, communication, behaviours, and leadership can benefit from a formal review to improve the performance of individuals and, thereby, teams [5]. The literature supports the use of simulation practice within the critical care setting to assist the professional development of healthcare workers in how to respond within a critical moment [6]. Simulation practice can assist with standardising training amongst disciplines focussing on improved team behaviours and providing a meaningful review of the clinical practices that may enhance non-technical skills within a safe environment [7]. Cox et al., suggest that in-situ simulation, as a training approach, can significantly benefit the participants as the learning opportunity occurs within the clinical setting environment [8].

## II. METHODS

This study entailed a convergent mixed-method approach using a convenience sample for data collection. The sample included a mix of nursing and medical staff working in the emergency department (ED) or critical care setting. Quantitative data was collected using a validated tool by Guise, et al. 2008; the Clinical Teamwork Scale (CTS). Using open and closed-ended questions, participant data was collected through pre- and post-participation feedback evaluation surveys during the group simulation.

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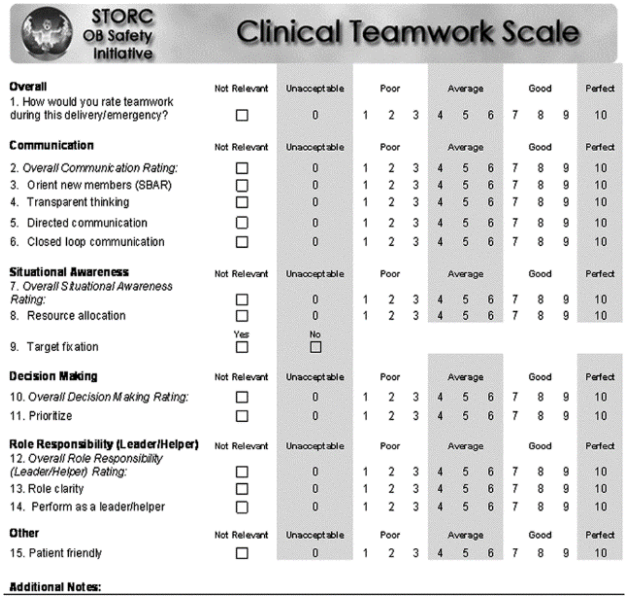
The significance of a mixed method approach assisted the study in gaining a deeper enquiry about the topic [9]. The focus of the study was directed towards the non-technical components within a resuscitation or critical event, seeking to explore whether the enhancement of human factors such as teamwork and communication can improve professional attitudes towards multidisciplinary simulation practice. The aim was to improve non-technical skills during resuscitation or a critical event. This research aimed to determine if enhancing non-technical skills through simulation practice can influence staff attitudes towards multidisciplinary simulation and whether these attitudes support implementing a regular simulation program. The study sought to review the measurement of communication and teamwork in multidisciplinary simulation practice in the ED. More specifically, focussing on attitudes towards implementing a regular simulation program. The study site is a peripheral privately and publicly funded hospital with two hundred and six licenced beds. The ED has thirty-three beds however exceeds this capacity daily through the activation of Capacity Escalation Plans. The average ED presentations are approximately 45,000 annually [10]. Participants were recruited through posters in the ED plus a mention in the daily morning meetings. The aim was to capture thirty staff over six to eight weeks, offering at least one simulation practice to each participant, containing six participants per week. The study recruited a total of thirty-two participants, sixteen from each discipline. Each participant completed a pre-simulation survey at the commencement of the simulation practice, and a post-simulation survey post the simulation practice. The chosen data collection strategy consisted of a convenience sample, whereby the participants were available to provide information to support the research [11]. Due to workplace staff availability, and time constraints, the number of simulations provided at this time were offered once per week. The project intended to provide introductory insight into the impact of simulation to warrant future practice and evaluation. The inclusion criteria consisted of nursing and medical staff employed at the site, including staff that regularly work in the ED or a critical care environment. The exclusion criteria consisted of all students, agency and locum staff. All requirements were met during the study. Ethics approval was obtained from the University (Reference Number: 2020-163F) and site (Reference Number: 2052). All participants were provided with a Participant Information Sheet (PIS), and Consent was obtained verbally through the participants' attendance and completion of a written consent form.

## III. RESULTS

All data were collected concurrently throughout the entire study. The complete data set was reviewed and analysed once all participants were captured. Two specific tools were used to collect data: the validated CTS [12] and the participant evaluation survey. The first tool, the CTS [12] was utilised to measure the participant's non-technical domains within the simulation practice. Bahr, et al. suggest that communication and teamwork are multilayered and therefore require technical and non-technical consideration. Technical skills, such as task performance, can be measured and assessed through structured competence assessment. Non-technical skills in this research were measured using the CTS [5]. The CTS tool measures the participants' efficiency in teamwork and communication within the simulation environment [13]. The CTS is divided into five components. The five components are communication, situational awareness, decision-making, role responsibility and other/patient friendly. The CTS tool also measures participant performance ratings (Figure 1).



STORC OB Safety Initiative

**Clinical Teamwork Scale**

| | Not Relevant | Unacceptable | Poor | | | Average | | | Good | | | Perfect |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Overall** | | | | | | | | | | | | |
| 1. How would you rate teamwork during this delivery/emergency? | ☐ | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| **Communication** | | | | | | | | | | | | |
| 2. *Overall Communication Rating:* | ☐ | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 3. Orient new members (SBAR) | ☐ | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 4. Transparent thinking | ☐ | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 5. Directed communication | ☐ | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 6. Closed loop communication | ☐ | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| **Situational Awareness** | | | | | | | | | | | | |
| 7. *Overall Situational Awareness Rating:* | ☐ | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 8. Resource allocation | ☐ | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 9. Target fixation | Yes ☐ | No ☐ | | | | | | | | | | |
| **Decision Making** | | | | | | | | | | | | |
| 10. *Overall Decision Making Rating:* | ☐ | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11. Prioritize | ☐ | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| **Role Responsibility (Leader/Helper)** | | | | | | | | | | | | |
| 12. *Overall Role Responsibility (Leader/Helper) Rating:* | ☐ | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 13. Role clarity | ☐ | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 14. Perform as a leader/helper | ☐ | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| **Other** | | | | | | | | | | | | |
| 15. Patient friendly | ☐ | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

**Additional Notes:**

**Figure 1. Clinical Teamwork Scale [12].**

A moderation session was held between the educational team of the ED Leadership team consisting of the Staff Development Nurses and Senior Registered Nurses to ensure a standardised approach to data collection. Each of these staff members participated in the facilitation of the simulations, and they all completed the validated tool to measure the quantitative component of the study. The evaluation survey data collected staff opinions before and after their engagement with the simulation. The questions were developed by the researcher, and face validity was assured through both clinical and academic experts reviewing and providing feedback [14]. Quantitative data from the CTS was analysed using the numerical coding provided within the CTS tool, which offered descriptive statistics for comparison of results [12]. The evaluation survey was analysed at the completion of the quantitative data analysis, providing insight into the participants' experience. Quotes were used to provide meaning to descriptive statistics. Across a six-week period, six simulations were facilitated, with six participants in each group, resulting in thirty-two participants. Of these, sixteen were nurses, and sixteen were medical officers. As some medical officers repeated the simulation practice, they were only included in data collection for their first encounter.

### A. Participant Evaluation Survey

The participant evaluation survey consisted of five questions for the participants to complete in the pre and post-simulation practice, plus two additional open-ended questions in the post-evaluation feedback. Pre-simulation findings are presented in Table 1, and post-simulation findings Table 2.

**Table 1. Pre-simulation feedback**

| | nurse | doctor | total # | total % | nurse | doctor | total # | total % | nurse | Doctor | total # | total % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Minimal | | | | Neutral | | | | Extremely | | | |
| 1. how comfortable are you with sim practice? | 1 | 1 | 2 | 6.25% | 12 | 12 | 24 | 75.00% | 3 | 3 | 6 | 18.75% |
| 2. do you think you have excellent teamwork and communication during a resus event? | 1 | 1 | 2 | 6.25% | 13 | 10 | 23 | 71.88% | 2 | 5 | 7 | 21.88% |
| | not likely | | | | Neutral | | | | most likely | | | |
| 3. how likely are you to participate in sim practice if it was available on a weekly basis? | 0 | 0 | 0 | 0.00% | 3 | 3 | 6 | 18.75% | 13 | 13 | 26 | 81.25% |
| | Mild | | | | Neutral | | | | Major | | | |
| 4. do you think sim practice will impact on your non-technical skills such as teamwork and communication? | 0 | 0 | 0 | 0.00% | 2 | 3 | 5 | 15.63% | 14 | 13 | 27 | 84.38% |
| | Minimal | | | | Neutral | | | | Extremely | | | |
| 5. how important do you think sim practice is? | 0 | 0 | 0 | 0.00% | 0 | 2 | 2 | 6.25% | 16 | 14 | 30 | 93.75% |

**Table 2. Post-simulation feedback**

| | 1-disagree | | | | 2-midly agree | | | | 3-neutral | | | | 4-agree | | | | 5-strongly agree | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nurse | Doctor | total # | total % | nurse | doctor | total # | total % | nurse | doctor | total # | total % | nurse | doctor | total # | total % | nurse | Doctor | total # | total % |
| 1. the sim practice improved my teamwork and communication | | | 0 | 0.00% | 1 | | 1 | 3.13% | 1 | 3 | 4 | 12.50% | 8 | 7 | 15 | 46.88% | 6 | 6 | 12 | 37.50% |
| 2. I feel more confident in a critical care event post sim practice | | | 0 | 0.00% | 1 | | 1 | 3.13% | 1 | 2 | 3 | 9.38% | 10 | 6 | 16 | 50.00% | 4 | 8 | 12 | 37.50% |
| 3. the sim practice helped with clarifying ways to reduce risk through closed loop communication | | | 0 | 0.00% | | | 0 | 0.00% | | 1 | 1 | 6.25% | 8 | 6 | 14 | 43.75% | 8 | 9 | 17 | 53.13% |
| 4. the sim practice highlighted the importance of non-technical skills such as teamwork and communication | | | 0 | 0.00% | | | 0 | 0.00% | | | 0 | 0.00% | 3 | 8 | 11 | 34.38% | 13 | 8 | 21 | 65.63% |
| 5. the debrief was important and I feel like I have gained a deeper understanding of the aim of the sim practice | | | 0 | 0.00% | | | 0 | 0.00% | | | 0 | 0.00% | 4 | 5 | 9 | 28.13% | 12 | 11 | 23 | 71.88% |

The findings from the participant pre-simulation evaluation survey indicated that staff were neither comfortable nor uncomfortable engaging in simulation practice, with most participants showing a 'neutral' stance. This reinforced the impression that the group had no bias for or against simulation. Participants also felt neutral about their communication skills, with only a small amount indicating a positive view set. The group held a positive attitude towards simulation, with a large amount indicating they would participate in a weekly simulation and that they felt it would impact their non-technical skills. "Reflected on physical surroundings and technical skills" (PN3). Overall, a very sizable number of participants felt that it was extremely important to participate in simulation practice. The reflective component during the debrief assisted with improving communication, "I was able to reflect on my role and ensure that closed loop communication was used, and how I can improve closed loop communication in the future" (PN4).

For the post-simulation evaluation survey feedback, there were a total of five closed questions and two open-ended questions. The first question sought to understand if the simulation practice improved the individual's teamwork and communication. Overall, no participant disagreed with the question, a tiny percentage mildly agreed and was neutral, nearly half of the participants agreed and over a quarter strongly agreed. This was a significant improvement from the pre-simulation survey, in which less than a quarter of participants expressed a positive view of their communication skills. The second question asked if the participants felt more confident in a critical care event post-simulation practice. Again, no participants disagreed, with only a very small amount either mildly agreeing or neutral. Half of the participants agreed and over a quarter strongly agreed. The third question examined whether simulation practice helped clarify ways to reduce the risk through closed-loop communication. No participant disagreed, with one participant providing a neutral response, the remaining choosing agreed and strongly agreed. Question four asked if simulation practice highlighted the importance of non-technical skills such as teamwork and communication. No participants disagreed or were neutral. A total of nearly half agreed and a high number of participants strongly agreed.

The final question asked participants about the importance of the debrief. This was overall the most positive outcome, with no participants disagreeing. A quarter agreed and a very high amount strongly agreed. Open-ended questions in the participant evaluation survey provided further detail about the participants experience. Questions are provided in Table 3.

**Table 3 Participant evaluation survey opened ended questions**

| |
|---|
| During the debrief, do you think we allowed you to delve into a deep reflective practice? If so, can you please explain how you reflected on your simulation experience? If not, can you please advise why you did not? |
| Do you think strong communication and teamwork can improve through simulation practice? If yes, please explain why? If no, please explain why? |

Overall, the response from both the nursing and medical participants, indicated there was a positive reply towards the first open-ended question. There was a high percentage of compliance with the first open-ended question from a review of all of the feedback forms. Multiple participants explained that the debrief session was helpful in reflective practice, and "allowed for team reflection and open communication" (PD1). PN6 advised that they were able to "reflect further on their role and closed loop communication", identifying how they can improve their communication in the future. The participants identified how they had individually performed and how they could improve on their performance, "the debrief allowed everyone to explain what they thought and why they did what they did" (PD13). A couple of participants raised that they were able to reflect on their performance, identifying what they did well and what they could improve on. They were able to voice their concerns at a collaborative level through the discussion in the debrief. "The debrief allowed me to verbalise what we did well and where we went wrong" (PD6). There were multiple points mentioned that "they could break down the events and reflect on improving as a team approach" (PN10). Identifying that "sometimes it is hard to self-recognise your own practice" The debrief provided the opportunity for the participants to identify their own gaps in communication and also to be heard by their peers. Everyone was given the opportunity to discuss their performance "Individual and team discussions were great, ironing out issues now is so much more valuable" (PN16). PD5 self-reflected further, wondering "if they should have spoken up earlier". Some suggestions for improvement were raised, with one participant noting that there was "not enough time for the debrief" (PD14). Whilst another participant noted that the simulation experience "was not a true reflection of the scribe/Team Leader role" (PN5). The second open-ended question raised the discussion point of whether strong teamwork and communication can improve during simulation practice. The overall response to this question indicated a positive outcome. All participants agreed that simulation practice can improve teamwork and communication, "allows for the opportunity for people to identify their strengths and weaknesses, which allows for improvement and education, which results in better patient outcomes" (PN2). A common theme from the nursing participants was their increased confidence level post-simulation practice, "communication is so important. Simulation practice gives us the confidence to work together as a team" (PN13). Another common theme was the participants identifying that simulation practice allowed them to participate within a safe and controlled environment that was real-like. They also had the opportunity they could highlight areas for improvement without enduring a stressful environment, "practice always improves processes, an opportunity to rehearse in a controlled environment" (PD7). PN1 advised that the simulation practice allowed them to "highlight good practice and explore options for improvement". PD4 also raised, "the experience can enhance the safety of the patient with providing effective and prompt management". Some participants also identified "the opportunity to prioritise their tasks" (PD11).

**B. Multiple participants identified the "opportunity to clarify roles" (PD8) within the resuscitation environment. PN15 felt they "were more prepared for when they are confronted with the real situation". A final comment raised by PD14 that resonated was "practice makes perfect".**

### C. Clinical Teamwork Scale Survey

The CTS tool [12] was used to measure the quantitative component of the simulation practice, in particular teamwork and communication, using five domains plus an overall rating. Each facilitator completed the form concerning each individual in the group. Findings refer to Table 4.

**Table 4 Clinical Teamwork Scale findings**

| Question | Not Relevant | | | Unacceptable | | | Poor | | | Average | | | Good | | | Perfect | | | Not Answered | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | M | Total | N | M | Total | N | M | Total | N | M | Total | N | M | Total | N | M | Total | N | M | Total |
| **1. overall** | | | | | | | | | | | | | | | | | | | | | |
| teamwork | | | **0** 0.00% | | | **0** 0.00% | 2 | 2 | **4** 12.50% | 5 | 5 | **10** 31.25% | 9 | 9 | **18** 56.25% | | | **0** 0.00% | | | **0** 0.00% |
| **2. communication** | | | | | | | | | | | | | | | | | | | | | |
| 2a. communication | | | **0** 0.00% | | | **0** 0.00% | 3 | 2 | **5** 15.63% | 7 | 5 | **12** 37.50% | 5 | 8 | **13** 40.63% | | | **0** 0.00% | 1 | 2 | **3** 9.38% |
| 2b. Orient members | 1 | 2 | **3** 9.38% | | | **0** 0.00% | 3 | 1 | **4** 12.50% | 7 | 4 | **11** 34.38% | 5 | 9 | **14** 43.75% | | | **0** 0.00% | | | **0** 0.00% |
| 2c. Transparent thinking | | 1 | **1** 3.13% | 1 | | **1** 3.13% | 3 | 2 | **5** 15.63% | 9 | 4 | **13** 40.63% | 3 | 6 | **9** 28.13% | | 2 | **2** 6.25% | | 1 | **1** 3.13% |
| 2d. directed communication | | | **0** 0.00% | 1 | | **1** 3.13% | 2 | 2 | **4** 12.50% | 6 | 3 | **9** 28.13% | 7 | 10 | **17** 53.13% | | 1 | **1** 3.13% | | | **0** 0.00% |
| 2e. Closed loop communication | | | **0** 0.00% | 1 | | **1** 3.13% | 2 | 3 | **5** 15.63% | 5 | 1 | **6** 18.75% | 7 | 10 | **17** 53.13% | | 1 | **1** 3.13% | 1 | 1 | **2** 6.25% |
| **3. situational awareness** | | | | | | | | | | | | | | | | | | | | | |
| 3a. Overall situational awareness | | | **0** 0.00% | | | **0** 0.00% | 2 | 2 | **4** 12.50% | 6 | 6 | **12** 37.50% | 8 | 8 | **16** 50.00% | | | **0** 0.00% | | | **0** 0.00% |
| 3b. Resource allocation | | | **0** 0.00% | | | **0** 0.00% | 1 | 2 | **3** 9.38% | 9 | 7 | **16** 50.00% | 6 | 7 | **13** 40.63% | | | **0** 0.00% | | | **0** 0.00% |

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3c. Target fixation | 15 | 14 | **29** | 90.63% | | | **0** | 0.00% | | | **0** | 0.00% | | | **0** | 0.00% | | | **0** | 0.00% | | | **0** | 0.00% | 1 | 2 | **3** | 9.38% |
| **4. decision making** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4a. decision making | | | **0** | 0.00% | | | **0** | 0.00% | 2 | 2 | **4** | 12.50% | 6 | 5 | **11** | 34.38% | 8 | 7 | **15** | 46.88% | | 2 | **2** | 6.25% | | | **0** | 0.00% |
| 4b. prioritise | | | **0** | 0.00% | | | **0** | 0.00% | 2 | 2 | **4** | 12.50% | 5 | 4 | **9** | 28.13% | 9 | 8 | **17** | 53.13% | | 2 | **2** | 6.25% | | | **0** | 0.00% |
| **5. role responsibility (leader/helper)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5a. Overall responsibility | | | **0** | 0.00% | | | **0** | 0.00% | 1 | 2 | **3** | 9.38% | 6 | 3 | **9** | 28.13% | 8 | 9 | **17** | 53.13% | | 2 | **2** | 6.25% | 1 | | **1** | 3.13% |
| 5b. Role clarity | | | **0** | 0.00% | | | **0** | 0.00% | 1 | 2 | **3** | 9.38% | 4 | 2 | **6** | 18.75% | 11 | 11 | **22** | 68.75% | | 1 | **1** | 3.13% | | | **0** | 0.00% |
| 5c. Perform leader/helper | | | **0** | 0.00% | | | **0** | 0.00% | 2 | 2 | **4** | 12.50% | 8 | 3 | **11** | 34.38% | 5 | 10 | **15** | 46.88% | | 1 | **1** | 3.13% | 1 | | **1** | 3.13% |
| **6. other** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6a. Patient friendly | 7 | 3 | **10** | 31.25% | | | **0** | 0.00% | 1 | 2 | **3** | 9.38% | 2 | 2 | **4** | 12.50% | 6 | 9 | **15** | 46.88% | | | **0** | 0.00% | | | **0** | 0.00% |

Note.
Nurse – N
Medical Doctor – M
Survey questions summarised for ease of printing

The CTS score measures the non-technical skills during the participant's simulation performance. The overall rating of the simulation was from unacceptable to perfect, with 56% of the participants rated by the observers as 'good', with no one being listed as Unacceptable, 12% performing at a poor level, 31% were average and no participant was perfect. Each domain is further described.

1. Communication- overall communication was measured by reviewing the components of orienting new members, transparent thinking, direct communication and closed-loop communication. No participants performed at an unacceptable measure, 15% were poor, 37% were average, 40% were good, and no participant was perfect. It was noted that 9% were not addressed in the measurement.
2. Situational awareness- overall situational awareness was measured by reviewing resource allocation and target fixation. No participants were unacceptable, 12% were poor, 37% were average, 50% were measured as good, and zero were perfect.
3. Decision making-overall decision-making also incorporated prioritisation. No participants performed unacceptable, 12% were poor, 34% were average, 46% were good, and 6% were perfect.
4. Role responsibility-overall role responsibility reviewed both aspects of leader and helper plus role clarity. No participants were unacceptable, 9% were poor, 28% were average, 53% were good, and 6% were perfect. It was also noted that a total of 3% was not measured.
5. Other- outlined the patient-friendly component. No participants were rated as unacceptable, 9% were poor, 12% were average, 46% were good, and no one was perfect.

## IV. DISCUSSION

Key findings for the study indicated a positive and successful outcome from a staff attitude perspective. Although only a small group of the participants felt Extremely Comfortable with simulation practice, many of them agreed that they would likely participate in regular simulation practice. A significant participant group also felt simulation practice highlighted the importance of non-technical skills and that simulation practice is essential. This identified the importance of simulation practice at a local level to provide a safe and effective learning environment. The findings support the research that the participants perceive improving teamwork and communication within a critical care event as a significant aspect of delivering quality care [4]. Wong, et al, raised the concern of minimal interprofessional training opportunities available in the healthcare setting and regular simulations can improve non-technical skills such as teamwork and communication. This study aimed to support this theory, and the findings around the optimistic attitudes captured throughout the study can further support the suggestion towards positive outcomes being linked with multidisciplinary simulation practice in the critical care setting [2]. The limitations identified during the study were that the site was small. A convenience sample was used due to time restraints and the scheduling of the weekly simulation practice. The choice of sample collection may come with a risk of impacting the rigour of the study however it was identified early as a financial impact on the institution in offering a randomised collection of data due to the cost of capturing participants over the weekend and after hours. The cost of attending a simulation over the weekend was increase due to shift benefits and a decrease in the availability of support staff as they worked during business hours. Overall, the financial impact took precedence in the data collection as the study did not want to burden the institutional costs. The study was limited to one site with an interest in increasing simulation training. The findings relate to this context and may not be generalisable. The CTS tool captured each participant at one point in time during the study. A longitudinal data collection period may provide greater insight into the long-term impact of simulation practice.

## V. CONCLUSION

The simulation study reviewed staff attitudes towards multidisciplinary simulation practice and the importance of non-technical skills such as teamwork and communication within a clinical setting. The findings were reported to be overall positive from the participant's perspective, which is a promising outcome for implementing a regular simulation program. The CTS tool provided an overall good measure of the domains assessed. The open-ended questions further offered a deeper insight into the staff attitudes towards the simulation practice, and this was a valuable resource for the study. Limitations regarding comparison towards another site and restrictions amongst only assessing one participant are identified. It is evident that the study has produced positive reinforcement of multidisciplinary simulation practice focussing on teamwork and communication, at a local level. Overall, the findings are suggestive of a positive trend towards implementing regular simulation practice locally. However, further analysis would be required.

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## DECLARATION

| | |
|---|---|
| Funding/ Grants/ Financial Support | No, I did not receive any financial support for this article. |
| Conflicts of Interest/ Competing Interests | No conflicts of interest to the best of our knowledge. |
| Ethical Approval and Consent to Participate | Ethics approval was obtained from the University of Notre Dame, Australia (Reference Number: 2020-163F) and site, Peel Health Campus, Ramsay Healthcare Australia (Reference Number: 2052). All participants were provided with a Participant Information Sheet (PIS), and Consent was obtained verbally through the participants' attendance and completion of a written consent form. |
| Availability of Data and Material/ Data Access Statement | Not relevant. |
| Authors Contributions | All authors having equal contribution for this article. |

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## AUTHORS PROFILE

**Katie Janz**, has around 16 years of experience working nationwide in multiple emergency departments, where she has contributed to and facilitated many different simulation programs. She completed her Master's study in simulation practice and is now pursuing a PhD in the same subject, as she holds a keen interest in human factors and the non-technical skills we can develop from simulation practice. Katie is now an Academic in the University setting where she can apply further knowledge and skills of simulation practice to the new and existing generation of health professionals.

**Kylie Russell**, is an experienced health professional working in higher education. Skilled in Program Design and Evaluation, Learning and Teaching, Research and Research Supervision. She holds a Graduate Certificate in Human Resource Management, a Master's in Health Science (Education), PhD and Bachelor of Nursing, and a graduate of the Australian Institute of Company Director's program and Women's Leadership Australia Executive Ready Program. Kylie is a non-executive board member at RAAFA, residential care | Independent living and ex-service organisation providing veteran advocacy and the Andrew Russell Veteran Living (ARVL) program for veterans experiencing homelessness