Learning teamworking and non-technical skills: a pilot study of a postgraduate course at the University of Florence

Citation: Verde V., Bardacci Y., Ballerini L., Baldassini Rodriguez S., Balestri C., Iovino P., Belli S., Bambi S. "Learning teamworking and non-technical skills: a pilot study of a postgraduate course at the University of Florence" (2023) *infermieristica journal* 2(2): 95-106. DOI: 10.36253/if-2080

Received: March 8, 2023

Revised: April 28, 2023

Just accepted online: June 30, 2023

Published: July 31, 2023

Data Availability Statement: All relevant data are within the paper and its Supporting Information files.

Competing Interests: The Author(s) declare(s) no conflict of interest.

Veronica Verde[1], Yari Bardacci[2], Lorenzo Ballerini[3], Samuele Baldassini Rodriguez[2], Chiara Balestri[4], Paolo Iovino[5], Simone Belli[6], Stefano Bambi[7]

[1] RN, CCN, Emergency Department, Nursing Home "Villa Fiorita", Prato - Italy
[2] RN, CCN, Emergency and Trauma Intensive Care Unit, Careggi University Hospital, Florence - Italy
[3] RN, CCN, Emergency Department, Careggi University Hospital, Florence – Italy
[4] Pedagogist, PhD, Research Fellow, Department of Health Science, University of Florence - Italy
[5] RN, MSN, PhD, Assistant Professor, Department of Health Science, University of Florence - Italy
[6] RN, MSN, PhD, Emergency and Trauma Intensive Care Unit, Careggi University Hospital, Florence - Italy
[7] RN, CCN, MSN, PhD, Associate Professor, Department of Health Science, University of Florence - Italy

Abstract

Background: Non-technical skills (NTS) are the cognitive and social skills that integrate the technical skills of a worker. In healthcare systems, NTS exert positive effects on patients' safety and healthcare professionals' efficiency.

Aim: This study aims to assess the degree of NTS knowledge, before and after a workshop administered to a group of 17 nursing students attending a critical care nursing postgraduate course at the University of Florence.

Methods: A cross-over design study was conducted. The workshop was composed of short lectures on "fundamentals of teamworking" and "team building and communication", followed by team activities and gaming. At the end of the day a medical "escape room" about a shock scenario, was developed and run by the students. A questionnaire investigating participants' entertainment and self-evaluation of NTS use, was administered at the end of the simulation sessions.

Results: A sample of 17 nurses was enrolled. Pre-posttests were completed by 16 participants. Seventy-five % (n=12) of the respondents found the team working activities exciting. Most of the participants (62.5%, n=10) considered the "escape shock room game" enjoyable and stimulating and would recommend

the learning activities to other healthcare professionals (75%, n=12). Compared to pre-test scores, statistically, significant improvements in NTS understanding were found on the topics of "team building" ($p<0.001$; $r= -0.60$), "teamworking" ($p= 0.001$; $r= -0.56$), "membership" ($p= 0.001$; $r= -0.56$), "hard skills" ($p= 0.001$; $r= -0.57$), "soft skills" ($p=0.001$; $r= -0.56$) and "situational awareness" ($p< 0.001$; $r= -0.61$) items.

Conclusions: The process of NTS training is well accepted by critical care nursing students and can improve their competencies. Therefore, simulation based NTS training programs and gaming activities should be periodically implemented as part of Critical Care Nursing Postgraduate Courses.

Keywords: Non-technical Skills, Training, Healthcare, Gaming, Virtual Simulation

Introduction

Non-technical skills (NTS) are the cognitive and social skills that complement a worker's technical skills. Fletcher et al. (2003) described seven NTS: situational awareness, decision-making, communication, teamwork, leadership, managing stress, and coping with fatigue[1]. These skills are transversal for all healthcare professions and are equally important to guarantee quality and safety outcomes[2].

In healthcare systems, the positive effects of NTS on patient safety and healthcare professionals' efficiency are well recognize[2]. In studies conducted in acute medical fields (operating theater, intensive care unit, and emergency room), researchers found significant similarities between anesthetist's workload profiles and pilots in aviation; such analogies were referred to as high criticality and complexity at the tasks required, in monitoring, and rapid responses to critical events[3]. Aviation implemented specialist training programs called Crew Resource Management (CRM). These learning activities were designed to increase the use of NTS to improve safety critical behaviours. Studies showed the possibility of adapting the CRM program to healthcare professionals, especially for the teams working in operating theatres, intensive care units, and emergency rooms[3].

A behavioral marker system was developed by a group of researchers that designed "The Anaesthetists' Non-Technical Skills (ANTS)". The purpose was to provide observable improved behaviors related to NTS. It comprises four categories: "situation awareness", "decision making", "task management" and "team working". These categories include 15 skills elements with examples of good and poor behaviors provided for each element. The associated rating is provided by a four-point scale: good, acceptable, marginal, and poor; the items can also be answered with the option "not observed"[4] .

To train the anesthetists' NTS, a CRM approach was usually adopted using both classroom and simulator sessions. The development of high-fidelity human patient simulators, which feature a life-size, lifelike, computer-driven mannequin set within a realistic clinical environment, enabled the creation of clinical scenarios to examine the behavioral aspects of professional performance. Such simulators have been used successfully to integrate theory with practice in CRM skills. Simulated scenarios involving operating theatre-based cases were developed, allowing participants to put NTS into practice. Debriefing was conducted using the ANTS framework to discuss and provide feedback on behavioral aspects of performance. Debriefing was also used to investigate the underlying cognitive processes. Anaesthetists attending the original CARMA (Crisis Avoidance and Resource Management for Anaesthetists) felt strongly that the program (and indeed clinical practise) would have benefited more from the presence of the other disciplines with whom they would work in these challenging situations[3]. Therefore, a "second generation" CARMa (Crisis Avoidance and Resource Management) was developed by focusing on emergency room scenarios with the involvement of the disciplines most likely to be applied in such areas, as anaesthesia, emergency medicine, and surgery[3].

Different teaching approaches, including simulations and gaming activities were introduced to facilitate the process of NTS learning and related practical applications; for example, Dieckmann et al. (2016) developed a simulation-based game called "Hand-it-on". This activity is an out-of-context exercise where subjects use simple non-medical tasks that provide new learning opportunities and are combined in a way so that a complex pattern of interactions between the participants can emerge[5]. An important part of the experience is the debriefing phase, where the dynamics of the game are analyzed and then related to actual healthcare practice. The description of the events that occurred during the simulation could be compared to clinical practice. Many studies have demonstrated that simulations and game-like approaches can be effective in learning ability processes. Rosenkrantz et al. (2019) designed the "MERGE" (Medical Escape Room Game Experience), a game-like method designed to apply NTS in a complex team-based situation[6]. Participants in a university summer school and international healthcare congress had to solve a medical aspect riddle, namely simple ECG interpretation or basic knowledge about the ABCDE resuscitation approach. Riddles were deliberately kept simple in medical terms to keep the focus on NTS. The study showed how the experience had sensitized participants to the importance of NTS and how they were linked to clinical practice[6].

The escape room game was introduced as a teaching method in another study involving nursing students from a Spanish university (Gómez-Urquiza et al., 2019)[7]. In this research, the students, in the second year of the nursing bachelor's degree, joined an escape room game after participating in a 16-week theoretical lesson program. Teachers chose many theoretical elements in the game which the students had to recall for solving the puzzles and finding the key to the exit. The students were divided into groups, and they had 30 minutes to complete the game. The day after the game, nursing students were invited to complete an online questionnaire evaluating their opinion on the escape room game. The students found the game enjoyable, and useful, and it helped them to recall and apply knowledge discussed during the theoretical lessons[7].

NTS training is also associated with an improvement in technical skills: according to the study by Seo and Cho (2021) who conducted a pretest-posttest experimental investigation on 46 nursing students in the fourth year of a University bachelor program, CPR (Cardiopulmonary resuscitation) outcomes were better after a specialized education program of the KALS (Korean Advanced Life Support)[8]. The students participated at two 6-hour lectures in groups, training the KALS guidelines of the Korean Cardiopulmonary Resuscitation Association and the NTS such as teamwork and leadership. In addition, they also investigated communication confidence, critical thinking tendencies, and self-efficacy in performing CPR. The results showed an improvement in both the performance of NTS and technical skills after the specialized KALS education programs, suggesting that the success of the CPR procedure is affected by NTS[8].

A wide body of research was conducted across critical care settings in order to evaluate the effectiveness of simulation and team training programs. An Italian study (Dante et al., 2022) evaluated the impact of a characteristic teaching model based on multiple exposures to high-fidelity simulations (double simulation program repeated after fifteen days managing virtual critically ill patients' care needs) in a group of 21 registered nurses enrolled in an intensive care postgraduate course[9]. Furthermore, the researchers investigated both the learning outcomes and the perceptions of the attendees of the learning program. The students achieved better outcomes from the multiple exposures to high-fidelity simulations, improved self-efficacy and self-confidence and expressed appreciation and positive emotions about the overall learning experience[9].

According to Boling and Hardin-Pierce (2016), simulation-based team training programs in ICU (Intensive Care Unit) met the satisfaction and agreement of registered nurses from different ICUs and attendees of an intensive care postgraduate course, recruited for the research[10]. They agreed about the improvement of their skills and showed positive attitudes about the importance of team performance related to patient safety, and team behaviors[10].

The importance of NTS in healthcare is recognized and specific training has been implemented, starting with the development of a behavioral marker system in Anesthesia[4,11]. In fact, research studies were conducted on NTS training and educational programs both for healthcare professionals and students. Nowadays, there are no shared guidelines on NTS educational programs. In Literature, there

are many studies describing different training activities and educational methods[3,5,8]. However, only few studies have proposed the "escape room" experience for healthcare professionals and students[6,7].

The primary aim of this study was to assess the degree of knowledge regarding NTS of postgraduate critical care nursing students, before and after a workshop and an escape room game conducted inside a university. The secondary aim was to evaluate the level of satisfaction and usefulness of the team-building activities and NTS learning.

Materials and Methods

Design

A pilot quasi-experimental pre-post study was performed with a group of nurses attending the postgraduate course "Critical Care Nursing in Adult Patients" at the University of Florence (Italy).

Sample

Convenience sampling was adopted for our study. Inclusion criteria for the participants were being nurses attending the postgraduate course "Critical Care Nursing in Adult Patients" at the University of Florence (academic year 2020-2021) and being Italian native speakers.

Procedure

Participants attended a three-day workshop experience ("SIMaster workshop program"), which focused on practical issues like team building, technical skills, and NTS. The methods implemented, as well as the duration of the contents, are reported in Table 1.

"SIMaster" workshop	Contents	Method	Duration
8th November 2021	· ABCDE primary assessment of the critically ill patient	Lecture	1h 30min
	· Proactive behavior, preview, and planning · Situation awareness · Communication skills; handover	Lecture	1h 45min
	· ABCDE assessment with mini scenarios	Low-fidelity simulation and skill practicum	3h
9th November 2021	· Team building and team working · Leadership and membership.	Lecture	1h 30min
	· Technical skills and non-technical skills · Briefing, debriefing, and defusing	Lecture	1h 45min
	· Team Building and team working activities	Game-like approach	2h 30min
	· "Escape shock room"	Game-like approach	2h

12th November 2021	· Non-technical and technical skill evaluation according to the ABCDE approach and debriefing at the end of each session	High-fidelity simulation test	2h (each group)
	· Closing of the workshop	Discussion	1h

Table 1. Outline of the "SIMaster workshop program".

The workshop trainers were nurses coming from ICUs. On the first day, the participants were randomly assigned to four groups (three groups composed of four learners and the remaining one of five learners) to participate in different low-fidelity mini scenarios on the ABCDE approach to the critically ill patient.

The second day, the learners attended different out-of-context team building learning activities. There were different workspaces where the trainers conducted the activities and supervised the students and their interactions. At the end of the day, a game-like exercise called "Escape Shock Room" was performed. The learners were assigned randomly in groups of four to five components. One group at a time played in a high-fidelity clinical scenario with a High Fidelity (HF) mannequin, while the other students could observe the scene through a wide screen in a classroom connected to the webcam placed in the simulation room. The instructors supervised the sessions outside the escape room and followed the participants' interactions in real time through a webcam and an audio connection. The game aimed to solve different riddles and puzzles within a time of 20 minutes. The specific knowledge and skills that the students were required to demonstrate, was performing an ABCDE assessment, an electrocardiogram, and arterial blood gas or ventilation parameters assessment.

Instruments

A questionnaire designed by the research team was used to collect data on the level of satisfaction and interest, as well as the effectiveness of the training methods. The structure of the questionnaire was similar to the ones used in other studies that investigated the interest in NTS (Gómez-Urquiza et al., 2019; Rosenkrantz et al., 2019). It was composed of 16 items divided into two sections. The first section was aimed at collecting anonymous demographic data of the participants (i.e., age, hospital work setting, and years of work as a nurse). The second part investigated the degree of entertainment and use of NTS after the workshop experience through self-evaluation.

The questionnaire evaluates the learning ability of NTS of the participants through their degree of knowledge before and after the workshop, using a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The abilities were investigated on the following topics: team building (ability and activities of creating and building a group), teamworking (acting together as a team), leadership (the ability to manage and lead a group), membership (sense of belonging to a group), hard skills (technical competences), soft skills (non-technical competences), briefing (exchange of information between the members of a group), debriefing (the process of reviewing following a simulated or clinical event), proactive and anticipating (developing in advance primary and contingency strategies for managing tasks and thinking ahead about potential outcomes and consequences of actions, intervention, non-intervention), situational awareness (the awareness of the environment in which one interacts), communication skills (the ability to convey or share ideas and feelings effectively), feedback (the process of returning of evaluative or corrective information about an action, event, or process) and handover (the patients nursing reports between colleagues at the change of shift).

The last part of the questionnaire investigates the satisfaction and usefulness of the workshop. The section presents 9 questions on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree) and two open-ended questions exploring the impressions of the students about the team-building activities and the escape shock room experience.

Data collection

All participants were asked to complete, anonymously, an ad-hoc online questionnaire through the Google Forms platform, to explore the learned knowledge about NTS and the individual satisfaction with the whole workshop. The questionnaire was administered through Google Forms® platform. To prevent students from responding more than once, only one response per Google Forms platform user was allowed by the system. The expected time for the compilation was 5 to 10 minutes. The questionnaire was administered between the 21st of March 2022 and the 21st of April 2022, at the end of the study plan of the Critical Care Nursing postgraduate course.

Statistical analysis

A descriptive and non-parametric statistical analysis of the data was performed using Stata/MP4. Demographic data and the other variables are reported as median (IQR) ± SD as appropriate. The Wilcoxon rank sum test was performed to analyze the differences in NTS scores before and after attending the workshop. A p-value ≤0.05 was considered statistically significant. Qualitative data, regarding the experience of the students on the team building activities and the escape shock room experience, were reported through the word cloud using the Mentimeter software® Version 3.2.7, 2021-08-26.

Ethical issue

All data collected were collected and stored anonymously, according to the current national body of law about privacy and personal data management. No healthcare data or identifiable personal data was collected or stored.

Results

All the seventeen participants in the postgraduate course were deemed suitable to be included in this study. Responses to the questionnaires were obtained from 16 participants (94,1%). The average age of the students was 29 years (SD±3). About half of the respondents were currently working in ICU (56.3%, n=9). Most participants had been working as a nurse for 3-5 years (62.5%, n=10).

Age, years (mean ± SD)	29 ± 3
Hospital setting (n, %)	
ICU	9 (56.3)
Surgical ward	3 (18.8)
Medicine	2 (12.5)
Operating room	1 (6.3)
Subintensive	1 (6.3)
Years of working experience (n, %)	
1-2 years	4 (25)
3-5 years	10 (62.5)
> 5 years	2 (12.5)

Table 2. Demographic characteristics of the participants (n=16).

As shown in Table 3, statistical significance was found for most of the domains addressed during the workshop experience, except for the leadership and communication skills. Team building and team working showed an important increase in positive evaluations (respectively z= -3.450; p<0.001 and z= -3.218, p=0.001).

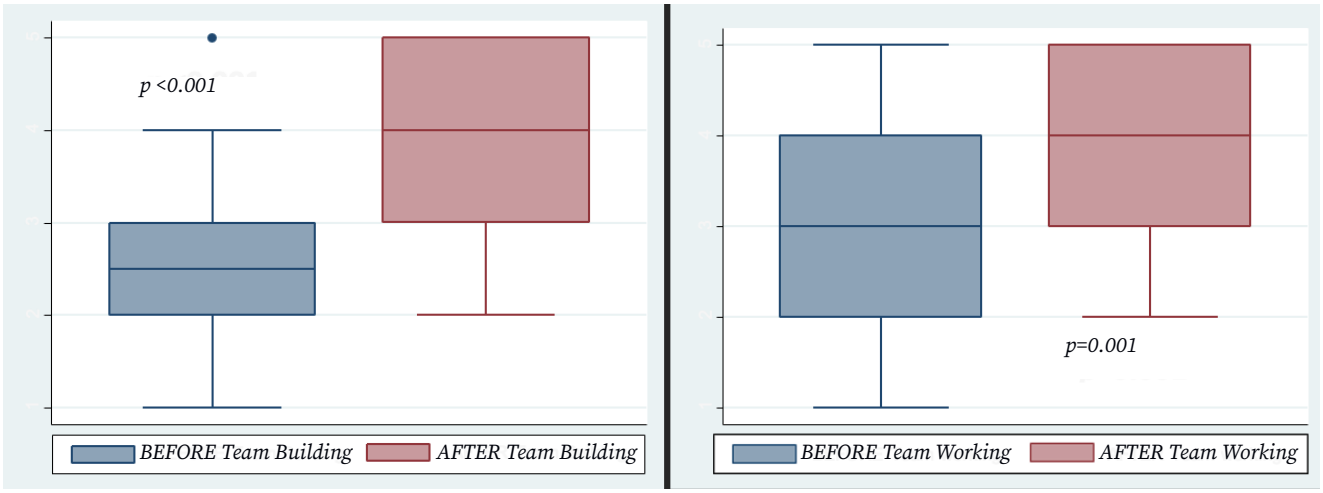
Membership revealed a positive development (z= -3.218; p=0.001). On the other hand, the results showed a previous knowledge of leadership (z= -1.658, p=0.09) and communication skills (z= -1.933, p=0.05). The results show a significant enhancement both in hard skills and soft skills (z= -3.275, p=0.001 and z= -3.175, p=0.001, respectively). Situational awareness was an issue little known by the respondents. Figure 5 shows an important increase in positive responses after the workshop (z= -3.490, p<0.001). The degree of knowledge about briefing and debriefing show significant improvements before and after the workshop (respectively z= -2.121, p=0.03 and z= -2.891, p=0.003).

Topics	Median SD		z-score	p-value
	Pre	Post		
Teambuilding	2.51.01	41.06	z= -3.450	p< 0.001
Teamworking	31.06	41.12	z= -3.218	p=0.001
Membership	41.36	40.99	z= -3.174	p=0.001
Leadership	41.01	41.09	z= -1.658	p=0.09
Hard skills	21.67	41.04	z= -3.275	p=0.001
Soft skills	2.51.41	41.08	z= -3.175	p=0.001
Briefing	41.02	51.12	z= -2.121	p=0.03
Debriefing	31.36	51.18	z= -2.891	p=0.003
Proactivity	31.36	41.06	z= -3.036	p=0.002
Situation awareness	21.09	41.07	z= -3.490	p< 0.001
Communication skills	41.14	51.16	z= -1.933	p=0.05
Feedback	3.51.26	51.0	z= -2.179	p=0.02
Handover	41.36	51.04	z= -2.547	p=0.01

Legend - SD: standard deviation.

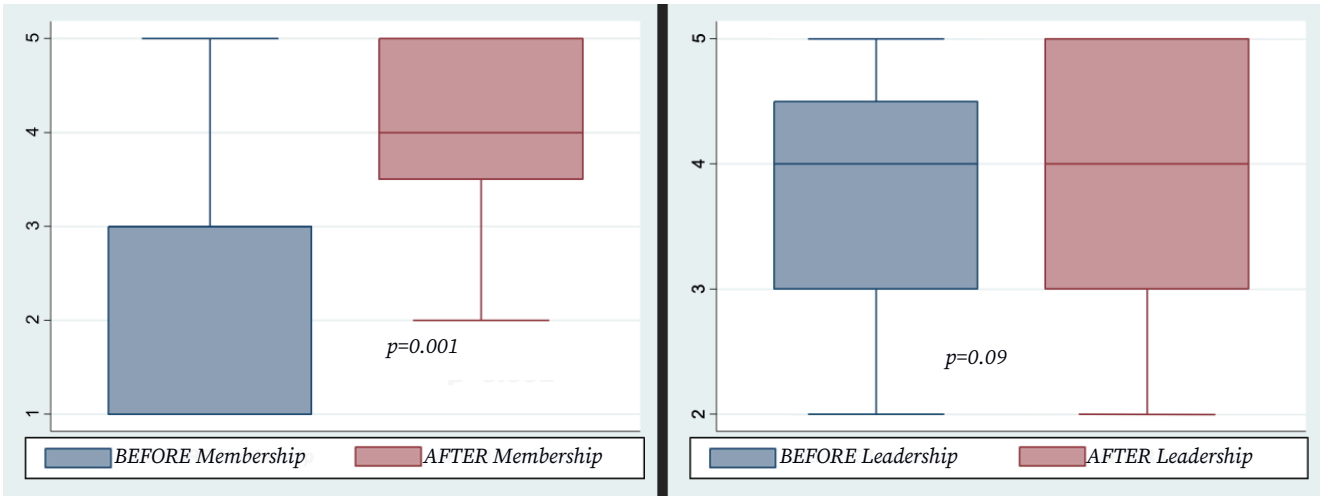
Table 3. Scores before and after the "SIMaster workshop" by topics

Below, the explorative statistical analysis represented by box plots (Figure 1-7).



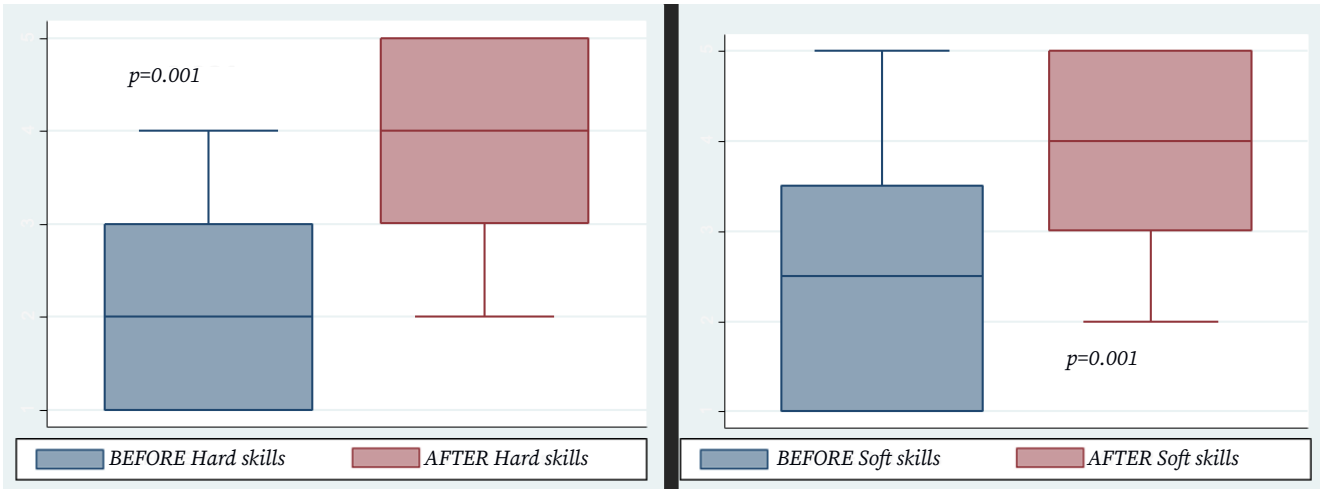
Data are expressed as median and quartile. Boldface P-value <0.05

Figure 1. Distribution of the degree of knowledge about team building and team working before and after the workshop



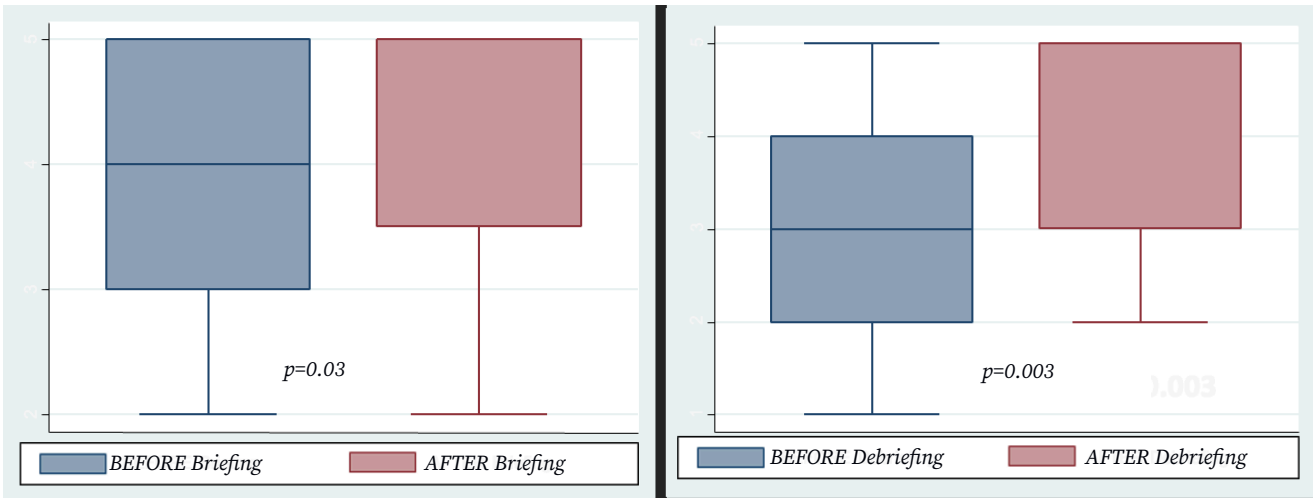
Data are expressed as median and quartile. Boldface P-value <0.05

Figure 2. Distribution of the degree of knowledge about membership and leadership before and after the workshop



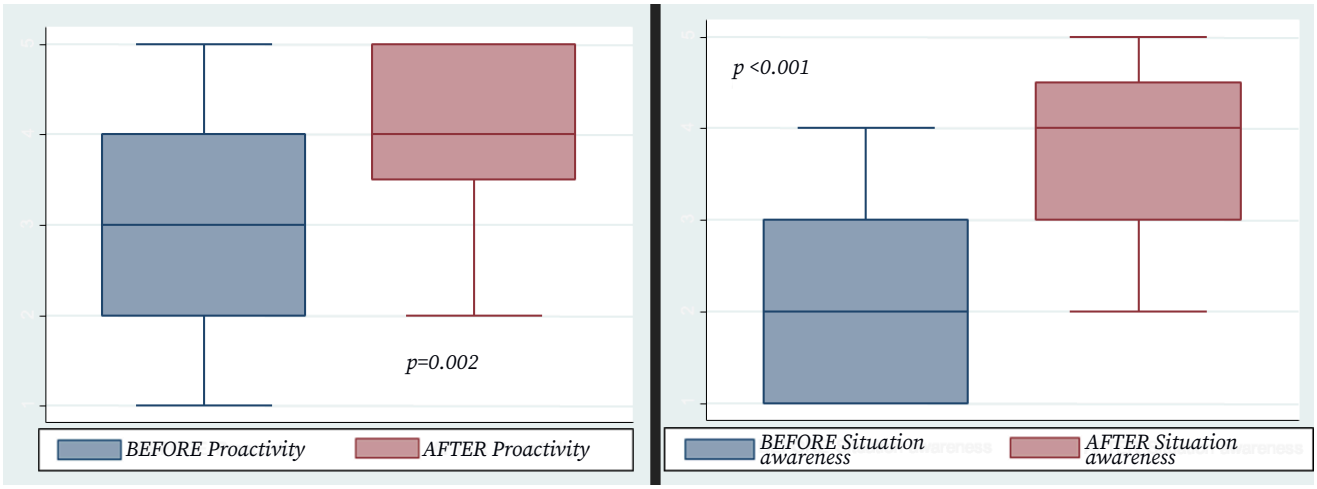
Data are expressed as median and quartile. Boldface P-value <0.05

Figure 3. Distribution of the degree of knowledge about hard skills and soft skills before and after the workshop



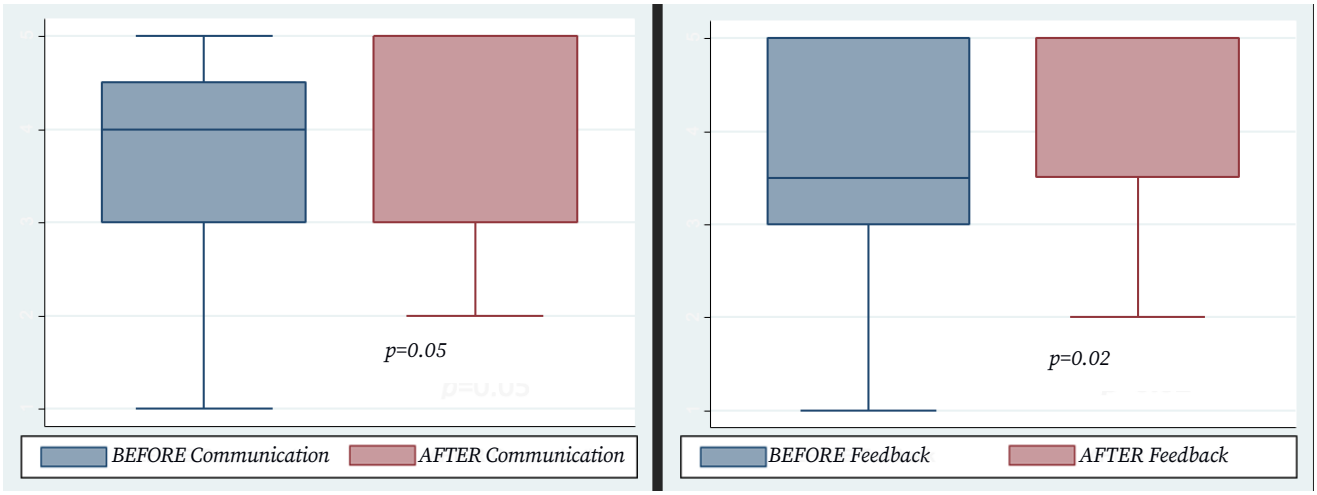
Data are expressed as median and quartile. Boldface P-value <0.05

Figure 4. Distribution of the degree of knowledge about briefing and debriefing before and after the workshop



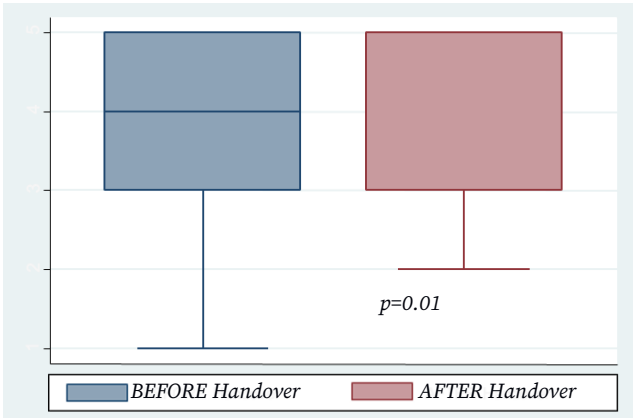
Data are expressed as median and quartile. Boldface P-value <0.05

Figure 5. Distribution of the degree of knowledge about proactivity and situation awareness before and after the workshop



Data are expressed as median and quartile. Boldface P-value <0.05

Figure 6. Distribution of the degree of knowledge about communication and feedback before and after the workshop



Data are expressed as median and quartile. Boldface P-value <0.05

Figure 7. Distribution of the degree of knowledge about team building and team working before and after the workshop

Lastly, the questionnaire investigated the satisfaction and the perception of the usefulness of team building activities and NTS learning. The responses to the last nine questions were assessed on a 5-point Likert-type scale from 1 (strongly disagree) to 5 (strongly agree) and represented below in Table 4.

Items		Median
1.	Team building was a stimulating activity	5
2.	"Escape shock room" was a stimulating activity	5
3.	Team building activities reflect aspects of clinical practice	4.5
4.	Application of NTS in your workplace	5
5.	Need for educational NTS programs	5
6.	Usefulness of the learning activities for healthcare professionals	5
7.	Acquisition of new skills	5
8.	Reproducibility of the skills acquired during the workshop	4.5
9.	Recommendation of NTS to other healthcare professionals	5

Table 4. Satisfaction of the learners on the workshop through the questionnaire's items (16 respondents)

As shown in Table 4, the median had a score between 4.5 and 5 in all the items. Therefore, satisfaction was high in all the domains. The responses to the 2 open questions were positive. The results are represented in the form of a word cloud. As shown in Figure 1, the highlighted words to describe the escape room game and the team building activities were "stimulating" and "motivating".

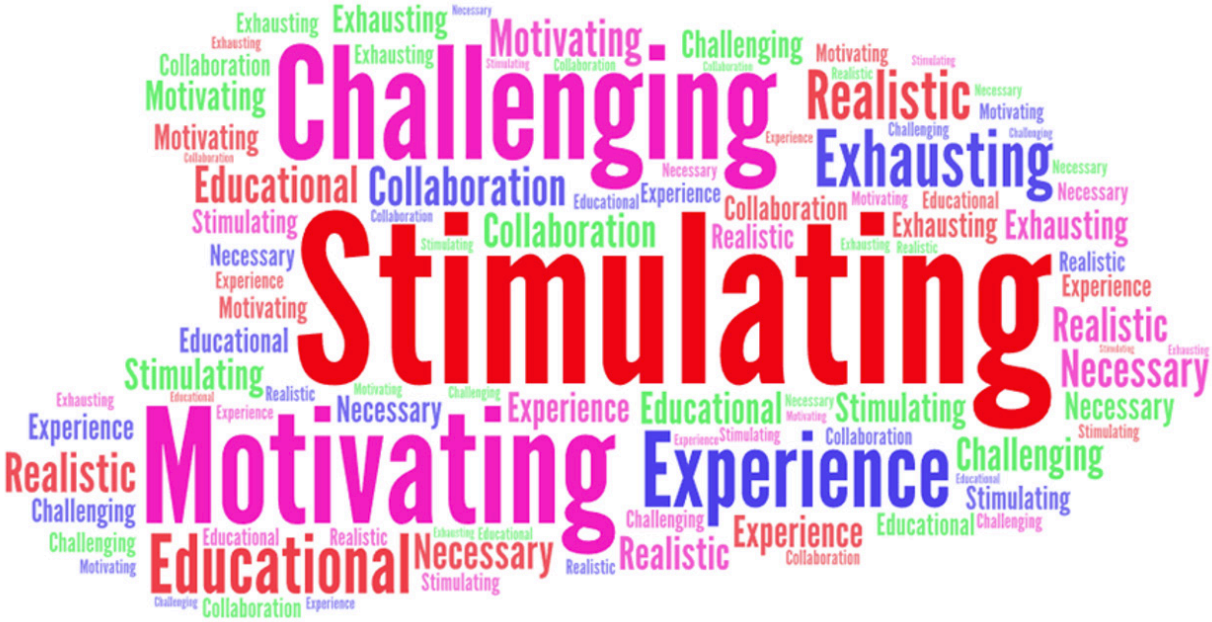


Figure 1. Representation of the brief comments about team building activities and the "escape shock room".

Discussion

This study aimed to assess the degree of knowledge regarding NTS, before and after a workshop experience. Our study shows a significant improvement in the acquisition of NTS after the learning activities and the escape shock room game. The solution of clues allowed the groups to acquire practical abilities in acute care. Moreover, the game allowed us to bring out and train NTS through the interaction and behavior of the teammates.

Of considerable importance was the finding of an important significance for most of the topics related to NTS, suggesting that the learning activities help them recall and apply knowledge, and promotes teamwork. Previous studies showed similar findings in the improvement of critical care knowledge in nursing students integrating clinical simulation into the theoretical lessons[12].

The results of our study indicate no significant improvement in the items "communication" and "handover". The two topics seemed to be already known by the learners before the workshop because these aspects are discussed in nursing bachelor's degree programs, and they are commonly used in clinical practice. Nevertheless, communication skills are not often the focus of most health education programs and nurses appear not to use it properly, due to the lack of training activities[13].

Moreover, the respondents of the questionnaire expressed their enthusiasm and found the activities and learning methods of NTS stimulating. These findings are similar to the studies published both for nursing and ICU registered nurses[7,14]. Participants agreed that NTS are important and necessary in daily clinical practice and that they deserve more training and development, not only for nurses but also for other healthcare professions[3,6,10].

Limitations and strengths

The first limitation of this study is related to the questionnaire, which was not tested and validated before its administration. Another limitation is related to the small sample size, which was due to the limited number of student participants at the Critical Care Nursing postgraduate course. Our study may also be affected by a recall bias due to the time from the workshop occurrence and the administration of the questionnaire to the interviewees. Despite the limitations, our study has also some strengths, including the fact that it was conducted on students attending a postgraduate course in "Critical Care Nursing in Adult Patients".

Conclusion

The results of our study show that the participant's score for NTS degree of knowledge improved significantly after the workshop. Although this study showed some limitations due to the low number of participants, and further studies are needed to confirm our results, it is interesting to observe how the opinions of the participants were favorable to the proposed activities. The development of simulation program for NTS, such as technical skills, should be part of the continuing education program, and these programs should be available in healthcare facilities and education courses. Specifically, in ICU, the integration of simulation programs, could help facing the increasing complexity of critical care settings and the presence of relatively inexperienced healthcare professions.

References

1. Rhona Flin, Paul O'Connor. Safety at the Sharp End: A Guide to Non-Technical Skills. (Taylor & Francis Ltd, ed.).; 2008.
2. Prati G, Pietrantoni L. COMPETENZE NON TECNICHE E MARCATORI COMPORTAMENTALI STEPbySTEP: Systematic Test of Exoskeleton Products by a Stairs-Based Testbed Evaluation Protocol View Project. https://www.researchgate.net/publication/237646799
3. Flin R, Maran N. Identifying and training non-technical skills for teams in acute medicine. Qual Saf Health Care. 2004;13(SUPPL. 1). doi:10.1136/qshc.2004.009993
4. University of Aberdeen. Framework for Observing and Rating Anaesthetists' Non-Technical Skills Anaesthetists' Non-Technical Skills (ANTS) System Handbook v1.0 TEAM WORKING TASK MANAGEMENT SITUATION AWARENESS DECISION MAKING Acknowledgement.; 2012. www.abdn.ac.uk/iprc/ANTS
5. Dieckmann P, Zeltner LG, Helsø AM. "Hand-it-on": an innovative simulation on the relation of non-technical skills to healthcare. Advances in Simulation. 2016;1(1). doi:10.1186/s41077-016-0031-0
6. Rosenkrantz O, Jensen TW, Sarmasoglu S, et al. Priming healthcare students on the importance of non-technical skills in healthcare: How to set up a medical escape room game experience. Med Teach. 2019;41(11):1285-1292. doi:10.1080/0142159X.2019.1636953
7. Gómez-Urquiza JL, Gómez-Salgado J, Albendín-García L, Correa-Rodríguez M, González-Jiménez E, Cañadas-De la Fuente GA. The impact on nursing students' opinions and motivation of using a "Nursing Escape Room" as a teaching game: A descriptive study. Nurse Educ Today. 2019;72:73-76. doi: 10.1016/j.nedt.2018.10.018
8. Seo YH, Cho KA. Effect of Korean advanced life support education on non-technical and technical skills of nursing students: A pilot study. Healthcare (Switzerland). 2021;9(10). doi: 10.3390/healthcare9101253
9. Dante A, la Cerra C, Caponnetto V, et al. Dose–Response Relationship between High-Fidelity Simulation and Intensive Care Nursing Students' Learning Outcomes: An Italian Multimethod Study. Int J Environ Res Public Health. 2022;19(2):617. doi:10.3390/ijerph19020617
10. Boling B, Hardin-Pierce M. The effect of high-fidelity simulation on knowledge and confidence in critical care training: An integrative review. Nurse Educ Pract. 2016;16(1):287-293. doi: 10.1016/j.nepr.2015.10.004
11. Fletcher G, Flin R, McGeorge M, Glavin R, Maran N, Patey R. Anaesthetists' non-technical skills (ANTS): Evaluation of a behavioural marker system. Br J Anaesth. 2003;90(5):580-588. doi:10.1093/bja/aeg112
12. Filomeno L, Renzi E, Insa-Calderón E. Effectiveness of clinical simulation on nursing student's improving critical care knowledge: A pretest-posttest study. Clinica Terapeutica. 2020;171(6):E501-E508. doi:10.7417/CT.2020.2264
13. Currey J, Oldland E, Considine J, Glanville D, Story I. Evaluation of postgraduate critical care nursing students' attitudes to, and engagement with, Team-Based Learning: A descriptive study. Intensive Crit Care Nurs. 2015;31(1):19-28. doi: 10.1016/j.iccn.2014.09.003
14. Ballangrud R, Hall-Lord ML, Hedelin B, Persenius M. Intensive care unit nurses' evaluation of simulation used for team training. Nurs Crit Care. 2014;19(4):175-184. doi:10.1111/nicc.12031