

Peer tutoring education: An interprofessional simulation with nursing and medical students

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Abstract. *Background and Aim of the Study:* Peer tutoring represents a collaborative educational approach wherein students assist one another to deepen their understanding of various subjects through small group interactive activities. This method has been widely and successfully implemented in medical and nursing education. Interprofessional training is recognized as a key factor in fostering collaborative practice among future healthcare professionals, leading to enhanced learning outcomes, increased self-efficacy, and the promotion of teamwork. The objective of this study was to evaluate the impact of a peer tutoring program led by nursing students on the clinical simulation training of medical students. *Methods:* This observational study assessed self-confidence in learning, satisfaction with the simulation experience, and overall participant satisfaction among medical students following a peer tutoring program facilitated by nursing students. Data were collected using self-reported, anonymous questionnaires. Participants, consisting of nursing and medical students from a university in northern Italy, were recruited voluntarily. *Results:* A total of 147 students participated in the study. The reliability of the assessment scales was confirmed. Medical students reported high levels of self-confidence and satisfaction with the simulation experience. However, no significant correlations were identified between the variables analyzed. *Conclusions:* The findings underscore the effectiveness and high satisfaction levels associated with the peer tutoring program. Peer tutoring offers valuable opportunities for developing skills that are crucial for future professional practice, enhancing self-efficacy, psychological safety, and promoting interprofessional collaboration among healthcare students. (www.actabiomedica.it)

Key words: peer tutoring, peer learning, nursing students, medical students, interprofessional education, simulation scenarios.

Introduction

Simulation-based learning is primarily used to develop scientific-technical knowledge and skills (1), but it also facilitates the development of non-technical skills, such as communication (2). Peer Learning (PL) is an active learning approach where “students learn from other students.” Peer Tutoring (PT) is a specific form of PL that involves structured role-switching between tutor and tutee among individuals of the same

or different academic years (3,4). Peer Tutoring is designed to integrate and enhance students’ understanding of topics through interactive small group activities (5,6). Peer learning is valuable for improving students’ practical skills and motivating them to acquire professional competencies. The benefits of students acting as peer tutors have been well documented and include metacognitive gains, increased student responsibility, and the development of professional skills (7,8). In this context, students also develop teaching abilities, which

form an additional part of their future professional roles (7). Peer education tends to offer more personalized instruction, which can increase learners' confidence and willingness to engage in training. Moreover, tutors and learners often share similar demographic and personal experiences, creating an environment conducive to open idea exchange (9). This contrasts with the traditional model where an experienced tutor guides a student, resulting in a substantial difference in roles (10). The peer education model helps build self-confidence in clinical settings, significantly enhancing students' learning capabilities (10). Attitudinal and behavioral changes have been observed in groups with similar interactions and language, as well as increased leadership characteristics in senior students (11,12). The peer education model has been successfully applied in both medical and nursing education (12). In medical education, as well as in nursing, peer tutoring addresses the need to provide concrete support to students (8). The acquisition of knowledge and skills necessary for medical practice is effectively facilitated by peer mentoring as a teaching and learning strategy (8,13). Peer mentoring contributes to the development of generic competencies and metacognitive skills, while also fostering high levels of personal satisfaction, increased student responsibility, and identification with a defined teaching role (13). Senior students, sharing common interests with their peers, can offer junior students opportunities to familiarize themselves with the scientific language, tasks, and processes of their new environment (14). At the same time, the peer mentoring process contributes to the professional identity development of senior students who, as future physicians, will be expected to teach and assess their peers (15). In nursing education, the presence of student tutors has been confirmed as an added value in the training process, with the tutoring experience itself being a catalyst for critical reflection, comparison, and personal and professional growth (15,16). Although there are cases where students feel they lack the opportunity to address gaps or correct errors (17), the concept of teamwork is strengthened in more relaxed laboratory environments, which encourage exposure to doubts and critical comparisons, leading to better formative growth (18). Peers serve as valuable sources of support and information during the learning process, especially

for psychomotor or technical skills (16). The outcomes of peer tutoring include individualized approaches, high motivation levels, feedback and error correction, improved communication skills, encouragement of independence and self-determination, and opportunities for social bonding and relationship building, all of which facilitate collaboration (19). During the training process, it is essential to promote collaboration not only among students within the same course of study but also among students (and future professionals) from different educational backgrounds. Interdisciplinary collaboration is not a new concept in healthcare. The World Health Organization (WHO) has recognized interdisciplinary collaboration as crucial for successful treatment outcomes (20). The literature highlights that interprofessional training fosters future collaborative practice (21). Additionally, it promotes communication skills, trust among team members, and conflict management abilities (22). By sensitizing students to interprofessional education and fostering collaboration skills during training, future professionals will be better equipped to leverage the skills of each member of the healthcare team (23). Collaboration is influenced by both individual and organizational factors, including training, resources, and rewards/incentives (21,22). Some authors (24) report positive outcomes in learning, self-efficacy, and collaboration promotion in future professionals through multiprofessional PT teams. Furthermore, such activities appear to help students develop teaching skills and professional values as they take on peer teaching responsibilities and prepare for healthcare practice (25). However, in Italy, there have been new attempts to implement peer tutoring in medical simulation, and where such initiatives exist, multiprofessional groups are lacking. This research aimed to describe the training experience of medical students during simulation sessions with nursing peer tutors.

Aim

The study aimed to investigate the outcomes of a peer tutoring program in clinical simulation training for medical students attending a university in Northern Italy. Specifically, the study explores medical students' satisfaction with the simulation experience, their

self-confidence in learning, and the overall satisfaction of all participants following a peer tutoring program led by nursing students.

Methods

Study design

This observational study evaluated third years medical students' self-confidence in learning, satisfaction with the simulation experience, and participant's satisfaction after clinical simulation training in a multi-level peer tutoring program with nursing students. Data collection took place between September and October 2020 and lasted approximately 30 days.

Study participants

The study used a non-probability convenience sampling strategy. Participants comprised 240 third-year medical students from a university in Northern Italy who had completed the Semeiotics and Clinical Methodology internship in December 2019 and agreed to take part in the study.

Instruments

Data were collected through a self-administered, anonymous questionnaire for medical students and consisting of four parts: (a) socio-demographic information (age, gender, past volunteering experiences in the medical-welfare field); (b) satisfaction with simulation experience (Guasconi et al., 2021) (30); and (c) Self-confidence in learning (d) Participant's Satisfaction. The "Satisfaction with the simulation experience" scale (SSE) is an Italian validation 6 items tool by Guasconi et al. (2021) that measure the degree of student satisfaction after clinical training through simulation (30) on a six-point Likert scale (1 = Strongly Disagree, 6 = Strongly Agree). The "Self-confidence in learning" scale measured how confident students felt during simulation scenarios. The scale was translated from Curtis et al.'s (2016) scale (26). No validated Italian scales for measuring these constructs were found in the literature. The translation process involved two

experienced translators with medical backgrounds from different medical centers. Each translator documented any translation difficulties encountered. The process revealed cultural challenges in translating the material, where a literal translation would not have achieved the same effectiveness as the original version or would have been difficult to comprehend. English idiomatic expressions required more explanatory and detailed sentences in Italian. Versions 1 and 2 were created and subsequently underwent a "quality control" session. A meeting was held between the coordinator and translators to discuss linguistic, emotional, and cultural aspects until a consensus was reached, resulting in Version 3. Two experienced bilingual doctors then revised this version, leading to Version 4. Finally, another bilingual translator who had not been involved previously retranslated Version 4 from Italian to English. Differences in translation were discussed again with the coordinator until Version 5 was finalized. Self-confidence in learning scale using a six-point Likert scale (1 = Strongly Disagree, 6 = Strongly Agree). The "Participant's satisfaction" scale instead examined the relationship satisfaction between the peer tutor and the students, based on an ad hoc scale developed from the literature (see table 4), was measured using a five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree).

The reliability of the Satisfaction with the Simulation Experience scale demonstrated a Cronbach's alpha coefficient of 0.904 and 0.845 for the self-confidence in learning scale.

Context

The clinical simulation training sessions were held in simulation laboratories equipped with low-complexity mannequins that accurately replicate anatomical structures.

Procedure

The peer tutoring program for clinical simulation training involved Medical and Nursing students. The training was structured into several sessions (Table 1). The first session was a plenary lecture held before the training, focusing on the bladder catheterization

Table 1. The peer tutoring program for clinical simulation training sessions

Session	Training Program	Peer tutor role	Partecipants
1	Plenary lecture on the bladder catheterization procedure for both male and female patients	--	Medical students (n=240)
2	Social hand washing, antiseptic hand washing, and both male and female bladder catheterization procedure simulation	Nursing students (n=6)	Medical students (n=45)
3	Social hand washing, antiseptic hand washing, and both male and female bladder catheterization procedure simulation	Medical students (n=45)	Medical students (n=240)

procedure for both male and female patients, tagged third years medical student (N=240). The second session involved training 45 medical students, facilitated by a group of 6 nursing students who served as peer tutors. This training took place in simulation laboratories and included the use of simulators and workstations. The nursing student peer tutors provided instruction to medical students on specific procedures, including social hand washing, antiseptic hand washing, and both male and female bladder catheterization. By the end of this phase, all 45 medical students had successfully completed their training. In the third session, all the medical students involved (N = 240) received training in the same manner focused on specific procedures, supported by medical students' peer tutors who had been trained in the previous session.

Data analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) software, version 22.0 for Windows (IBM Corp, Released, 2013). Sample characteristics and questionnaire responses were described using means and frequencies (percentages).

Descriptive analysis was employed to describe, organize, and summarize the data, including measures of central tendency, which indicate the approximate location or center of a data distribution (27), averaged accordingly. Measures of dispersion, particularly standard deviation, were used to show variability in the numerical data set (27). Statistical analysis was applied to examine the relationships between the variables under study, utilizing the Pearson correlation coefficient, a parametric statistical measure of correlation.

Ethical considerations

As the study involved educational experimentation aimed at improving course quality, authorization was sought from the relevant course councils. Both the Nursing and Medicine and Surgery courses granted permission to administer the questionnaire to participating students. Participation in the research project was voluntary and free from any form of benefit or coercion. Completion of the questionnaire was considered as informed consent to participate in the study. The confidentiality of the collected data was ensured, in accordance with current legislation, given the sensitive nature of the information.

Results

Participant demographics

147 third-year Medicine students participated in the study, representing a response rate of 61% from a population of 240 students. The participants had an average age of 22 years, with 66.7% identifying as female and 33.3% as male. Additionally, 21% of the sample reported previous experience in volunteering in the medical-health field. Table 2 provides a detailed description of the participants' socio-demographic characteristics, including gender, age, and volunteering experience.

Satisfaction with the Simulation Experience (SSE)

Students self-reported high satisfaction with the learning experience provided by the simulation (M = 4.59; SD = 1.23). The responses were skewed to the left, with most participants either agreeing or strongly agreeing with all six items (see Table 3).

Self-confidence in learning

Medical students self-reported high levels of self-confidence in the required skills following the simulation experience ($M = 4.65$; $SD = 1.06$). Responses to the six items on the Self-Confidence subscale indicated

Table 2. Participants' characteristic

Gender (Percentages)	
Men	33,3%
Women	66,7%
Mean age (years)	22,73
Volunteer's experience	
No	78,9%
Yes	21,1%

that the majority of participants either agreed or strongly agreed with all items (see Table 3).

Participant's satisfaction

The students reported high levels of satisfaction with their relationship with the peer tutor, as indicated by the overall mean of the subscale ($M = 4.34$; $SD = 0.65$). See Table 4.

No significant correlations were found between the various variables considered.

Discussion

Peer tutoring, understood as cooperative learning (15), combined with the concept of collaboration between students from different professional

Table 3. SSE and Self-confidence in learning Frequency and Mean

Satisfaction with Simulation experience (SSE) items	SD	D	SWD	SWA	A	SA	MEAN	DS
1. I had the opportunity to reflect on and discuss my performance during the debriefing.	5	13	16	30	51	32	4,41	1,37
2. Reflecting on and discussing the simulation enhanced my learning.	1	5	15	35	54	37	4,70	1,13
3. This was a valuable learning experience.	1	2	9	32	58	45	4,93	1,05
4. The simulation helped me to recognise my clinical strengths and weaknesses.	9	11	23	39	38	27	4,18	1,48
5. The facilitator summarised important issues during the debriefing.	3	6	18	30	59	31	4,60	1,29
6. The simulation activity stimulated my interest in learning the subject matter of the course.	2	4	8	30	57	46	4,91	1,23
Self-confidence in learning items	SD	D	SWD	SWA	A	SA	MEAN	DS
7. The teaching methods used in this simulation were helpful and effective.	1	1	3	20	88	34	4,98	0,85
8. The teaching materials used in this simulation were motivating and helped me to learn.	1	1	5	30	71	39	4,93	0,91
9. I am confident that I am mastering the content of the simulation activity that my instructors presented to me.	3	8	22	53	50	11	4,16	1,08
10. I am confident that I am developing the skills and obtaining the required knowledge from this simulation to perform necessary tasks in a clinical setting.	5	8	24	45	47	18	4,19	1,20
11. It is my responsibility as the student to learn what I need to know from this simulation activity	1	0	3	17	64	62	5,24	0,82
12. I know how to use simulation activities to learn critical aspects of these skills.	2	6	16	43	67	13	4,41	1,03

Abbreviations: SD = Strongly Disagree; D = Disagree; SWD = Somewhat Disagree; SWA=Somewhat Agree; A = Agree; SA = Strongly Agree

Table 4. Frequency and mean of Participant's Satisfaction

Participant's Satisfaction	SD	D	SD-SA	A	SA	MEAN	DS
1. Your tutor has been well prepared for the session	0	3	8	79	57	4,35	0,97
2. It was easy to communicate with your peer tutor	0	1	6	66	74	4,51	0,99
3. The feedback provided by your tutor has been good	0	3	10	78	56	4,34	1,11

Abbreviations: SD = Strongly Disagree; D = Disagree; SD-SA = Some Disagree - Some Agree; A = Agree; SA = Strongly Agree

backgrounds, formed the theoretical and logical framework of this study. Peer tutoring is a flexible educational strategy aimed at facilitating the transfer of knowledge, emotions, and experiences. This approach is made possible by the continuous evolution of educational methodologies, which move beyond traditional teaching methods to promote critical thinking and educational discourse among students (28). The initial model aimed to evaluate the effectiveness of peer tutoring among medical students, with nursing students acting as peer tutors. The dimensions investigated were confidence, satisfaction, and the satisfaction of peer tutor program. These dimensions were effectively assessed by the survey instrument used, as evidenced by its strong psychometric properties. Among the dimensions studied, "satisfaction" emerged as the most significant a result that is consistent with the existing literature (10). A primary benefit of the peer learning model is that working together and supporting one another reduces anxiety when entering a new clinical environment. The ability to ask questions freely, reflect, and discuss with peers, without needing to consult the tutor first, contributes significantly to students' sense of security. The "confidence" dimension revealed that most participants agreed in viewing peer tutoring as a valuable learning experience. The literature supports this, noting that students often feel more at ease in peer tutoring sessions, where peer tutors can offer a more personalized teaching approach (9). Consequently, peer learning provides opportunities to practice skills that are valuable in future professional settings, enhancing self-efficacy and psychological safety (29). The scale employed proved to be an effective tool for investigating these three dimensions, creating a foundation for further studies that could be replicated in different settings and with diverse participant groups. The implications of this study's findings are multifaceted:

in research, as the concept of peer tutoring continues to gain traction in both nursing and medical education; in practice, to strengthen collaborative relationships between students from different degree programs but with shared educational pathways; and in training, as an innovative method among various educational strategies.

Future research could further explore the perceptions of peer tutors involved in various learning opportunities, potentially utilizing qualitative methodologies.

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