EMPIRICAL RESEARCH QUALITATIVE

Bachelor of nursing students' experiences of a longitudinal team training intervention and the use of teamwork skills in clinical practice—A qualitative descriptive study

Tore Karlsen[1] | Marie Louise Hall-Lord[1,2] | Sigrid Wangensteen[1] | Randi Ballangrud[1]

[1]Department of Health Sciences in Gjøvik, Faculty of Medicine and Health Sciences, Norwegian University of Science and Technology (NTNU), Gjøvik, Norway

[2]Department of Health Sciences, Faculty of Health Science and Technology, Karlstad University, Karlstad, Sweden

Correspondence
Tore Karlsen, Department of Health Sciences in Gjøvik, Faculty of Medicine and Health Sciences, Norwegian University of Science and Technology (NTNU), Norway.
Email: tore.karlsen@ntnu.no

Abstract

Aims: To describe nursing students' experiences of a TeamSTEPPS® longitudinal team training program and the application of teamwork skills in clinical practice.

Design: A descriptive qualitative design.

Methods: Overall, 22 nursing students participated in six online focus group interviews after attending a TeamSTEPPS® team training program from their first semester. The data were audio-recorded, transcribed and analysed using inductive content analysis and reported following the COREQ guidelines. The focus group interviews took place in the students' fifth's semester.

Results: The main category "Learning teamwork is not an event; it's a journey" emerged from 3 generic categories and 12 subcategories. The participants reported that grasping the relevance of team training and the use of teamwork skills takes time. Utilizing these skills improved their awareness of being a team member and facilitated learning.

Conclusion: Team training raised the participants' awareness of teamwork as an essential component of being a professional nurse. Additionally, understanding the complexity of teamwork takes time.

KEYWORDS
clinical practice, nursing, qualitative study, team training, teamwork

1 | INTRODUCTION

Competence in teamwork is fundamental for all healthcare students to ensure quality care and patient safety, as stated by the World Health Organization (WHO) (2011). *Teamwork* can be described as "the interaction or relationship of two or more health professionals who work interdependently to provide care for patients" (Oandasan et al., 2006, p. 3). It is one of the six core competencies in the quality and safety education curriculum of healthcare professions in the United States (US) (Cronenwett et al., 2007). The European Union requires that nursing education in all affiliated countries should teach "students to not only learn how to work in a team but also how to lead a team and organize overall nursing care" (The European Parliament and the Council of the European Union, 2013, section 3, article 31.5). The Norwegian government's vision for healthcare services is that "the tasks must be accomplished in teams – across disciplines and institutions" (Norwegian Ministry of Health and Care Services, 2019, p. 33). Students should be prepared to work as professional nurses

within nursing and inter-professional teams (Kaiser & Westers, 2018). Team training has been implemented in the education of Bachelor of Nursing students in Norway to a limited extent (Aase et al., 2013).

2 | BACKGROUND

"*Team training* is a learning activity focusing on developing, refining, and reinforcing knowledge, skills, or attitudes that underlie effective teamwork behaviors" (Weaver et al., 2014, p. 360). The ultimate goal of team training is to improve patient safety and patient care quality (Reeves et al., 2017). Learning to be an effective team player requires learners to practice teamwork actively; merely lecturing about its importance is insufficient (Barton et al., 2018). The Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS®) is an evidence-based team training program developed by the Agency of Health Research and Quality (AHRQ) in collaboration with the Department of Defence in the US (AHRQ, 2019). Team behaviours are taught through learning activities, including classroom instructions, simulation training, feedback and reflection in clinical training (AHRQ, 2015). This program is designed to be adapted to all healthcare services, from acute to municipal long-term care (AHRQ, 2019). Its curriculum focuses on the team structure and four learnable skills: communication, leadership, situation monitoring and mutual support. There are multiple strategies and tools that can be used in daily care to enhance team performance and thus patient care. Teamwork focuses on establishing a shared mental model within the team and providing effective and safe patient care (AHRQ, 2019; King et al., 2008). Table 1 presents an overview of the key principles/skills in TeamSTEPPS®.

The TeamSTEPPS® team training curriculum has been employed in undergraduate bachelor's nursing education, mainly in the US (Foster et al., 2019; Ross et al., 2020). In addition to one study in Norway (Karlsen et al., 2022), three studies in the US have reported findings from longitudinal TeamSTEPPS® team training interventions throughout the bachelor program (Maguire et al., 2015; Maneval et al., 2020; Ross et al., 2021). Team training has been shown to enhance students' attitudes toward teamwork (Karlsen et al., 2022; Maguire et al., 2015; Maneval et al., 2020) and improve teamwork knowledge (Ross et al., 2021). Additionally, qualitative findings have indicated that TeamSTEPPS® training helps students with their transition to a registered nurse's role, enhances professional and effective communication with other team members and supports their understanding of inter-professional communication (Ross et al., 2021).

Cant et al. (2021) found that nursing students' experiences of teamwork in clinical placements are affected by multiple factors related to the learning process and environment. To our knowledge, only one study has reported nursing students' experiences regarding a longitudinal team training intervention collected by answering open-ended questions (Ross et al., 2021). However, in-depth knowledge about how nursing students experience team training and teamwork associated with a longitudinal TeamSTEPPS® intervention is lacking (Ross et al., 2021).

3 | THE STUDY

3.1 | Aims and objectives

This study aimed to describe nursing students' experiences of the TeamSTEPPS® longitudinal team training program and the use of teamwork skills in clinical practice.

4 | METHODS

4.1 | Design

A descriptive qualitative research design was employed to obtain a profound and detailed understanding of nursing students' experiences of team training and teamwork (Polit & Beck, 2021).

TABLE 1 TeamSTEPPS® key principles (AHRQ, 2019).

Team structure	Identification of the components of a multi-team system that must work together effectively to ensure patient safety. This principle covers ensuring that the team has the required numbers of team members with an appropriate competence needed to reach the team's goal and the equipment needed that is functioning and available
Communication	The structured process by which information is clearly and accurately exchanged among team members. The tools comprise structured handover, closed-loop communication, and taking a stand if patient safety is threatened
Leadership	The ability to maximize the team members' activities by ensuring that team actions are understood, information changes are shared, and team members have the necessary resources. The tools to support team leadership include sharing the goal that the team is striving to achieve and assigning the team members roles and tasks. In addition, briefing, huddling and debriefing to share information, goals, and feedback on taskwork and teamwork
Situation monitoring	The process of actively scanning and assessing situational elements to gaining information, understanding or maintaining awareness to support team functioning. This teamwork skill includes cross-monitoring team members, monitoring the patients, the environment, and whether the task is leading the team toward the desired outcome
Mutual support	The ability to anticipate and support team members' needs thorough, accurate knowledge about their responsibilities and workload. The tools include feedback, task assistance, patient advocacy, and raising your voice if patient safety is threatened. Conflict management toward personal and professional disagreements are strategies within this principle

4.2 | Sampling and recruitment

This study was conducted at a university campus offering a Bachelor of Nursing program where all students ($N=140$) had received TeamSTEPPS® team training since the start of the program in August 2018. In 2020 (fifth semester), the students were invited to participate in the study when they were attending a hospital clinical placement of 10 weeks. The program comprises five clinical placements of 10 weeks duration throughout their bachelor program. The students were supervised by one or two supervisors or were in a group of 10–15 students at a hospital unit with one main supervisor as a coordinator and supervised by the nursing staff in daily nursing care.

The faculty members responsible for the clinical placement students invited the latter to participate through e-mails. Those who were interested in participating e-mailed the first author (TK). Overall, 22 students consented to participate and received an e-mail invitation with further information and a link to the digital room where the interviews occurred.

4.3 | The intervention

The students attended 15.5 h of lectures and workshops throughout the implementation period, in addition to learning activities that were redesigned to include teamwork skills in the existing courses. Table 2 displays the intervention overview.

The TeamSTEPPS® program comprises three phases according to its implementation guide (AHRQ, 2017), and the learning material was approved for translation to Norwegian by the AHRQ. The TeamSTEPPS® team training program was conducted for the students from August 2018 to October 2020.

4.3.1 | Phase I

The intervention idea was presented at a workshop with the faculty who found TeamSTEPPS® helpful in teaching teamwork skills in simulation activities. The faculty were familiar with some skills and tools but required further knowledge regarding those that were unfamiliar. A change team of four TeamSTEPPS® master trainers planned the implementation. The team training was designed to progress from the first to the fifth semester, preferably integrated into regular learning activities to facilitate its execution.

The faculty members were coached to implement the team training through a 3-h TeamSTEPPS® course, regular meetings and written recommendations. Additional learning material, such as videos depicting teamwork skills used in clinical settings explaining the five teamwork principles, was developed in Norwegian. Posters regarding teamwork best practices were created and published at the simulation centres to raise awareness of how teamwork skills could improve patient safety.

4.3.2 | Phase II

This stage involved training and implementation. High- (advanced patient manikin or standardized patient) and low-fidelity simulations (skills training) were used extensively in team training. The teamwork skills were executed in basic nursing skills courses at the campus and in four clinical placements. Further, two scenarios were designed to challenge the use of teamwork skills: one in a psychiatric department with a patient suffering from depression, thus demanding team communication and situation monitoring; and the other regarding acute care that challenged the students to communicate patient information using the Identification, Situation, Background, Assessment and Recommendation (ISBAR) structure. Two or three students were active in the scenarios offering nursing care, while 10–15 students were observers. During the first-aid day, all students were required to participate in seven scenarios with patient manikins or senior students simulating injured individuals. Teamwork skills were highlighted in the briefing and debriefing to accomplish effective and safe first-aid care. Additionally, teamwork skills and principles were focused on in two 2-h reflection sessions in all clinical placements, workshops and classroom lectures.

4.3.3 | Phase III

This phase focused on sustainability and was integrated into the students' fifth semester. The team training integration continued in the skill-training sessions. The coronavirus disease-2019 (COVID-19) pandemic made it necessary to replace a simulation scenario at the campus with an online reflection session during the students' clinical placement. The students watched a simulated situation displaying a nursing team taking care of a deteriorating septic patient; there was disagreement among the team members concerning treatment, drug administration safety and the timing of including a physician in the team. The students were visible and audible to each other and had the opportunity to converse online. They rated the teamwork using the TeamSTEPPS® Team Performance Observation Tool (AHRQ, 2014), followed by further reflections. During the second reflection session, the same scenario was employed to focus on conflict management and resolve disagreements within the team.

4.4 | Inclusion and/or exclusion criteria

Inclusion criteria were that the students were attending a clinical placement in their fifth semester and had started their nursing education in August 2018.

4.5 | Data sources/collection

The six focus group interviews were conducted in October 2020. Focus group interviews are beneficial for exploring people's

TABLE 2 Overview of the TeamSTEPPS® intervention.

Semester	Month	Description of the intervention
1	End of August–December 2018	Introduction to teamwork skills in basic nursing skills training. Inclusion of the patient in the **Team Structure**. Skill training was conducted in 40 groups of 3–4 students in each. How **Communication, Leadership,** and **Mutual Support** affect the performance of nursing skills.
2	January 2019	A 6-h TeamSTEPPS® Fundamental's course was conducted. Teamwork skills were integrated as a part of the basic nursing skill training. The TeamSTEPPS® pocket guide was distributed. A TeamSTEPPS® module was established in the Blackboard learning platform. The videos of examples of teamwork skills were published.
	February–March 2019	**Leadership** skills, with *briefing* and *debriefing*, were used in each skill training session. The *ISBAR* **Communication** tool was employed in a simulated scenario.
	April 2019	**Mutual Support** skills, a 2-h *feedback* workshop.
	May–June 2019	Reflection session. How could the use of teamwork skills improve learning outcomes in clinical placements?
3	August 2019	A 30-min TeamSTEPPS® summary lecture was delivered. A 7-h first-aid training day. All teamwork skills and strategies were a part of the *briefing* and *debriefing* sessions of seven scenarios. The teamwork "best practice" posters were displayed in the simulation centre facilities.
	August–October 2019	**Situation Monitoring** and **Mutual Support** training when training complex nursing procedures. Five videos of two faculty members discussing each teamwork principle were published at the learning platform. **Situation Monitoring and Communication**. Focus on establishing a *shared mental model* in a simulated scenario within psychiatric care.
	October–December 2019	The use of the *ISBAR* **Communication** in a simulated scenario was continued. The demonstration videos of the *IPASS handover* were published. Reflection session – application of teamwork skills in clinical placements.
4	January–February 2020	One-hour **Mutual Support** lecture. Focus on just culture, psychological safety, and fallibility in nursing practice.
	March–June 2020	Reflection task; students' experience of using **Leadership** skills in clinical placement.
5	August–October 2020	Continuing focus on teamwork skills in complex nursing skill training and clinical placements. Reflection session online. Rating teamwork in a nursing team taking care of a septic patient in a simulated scenario. The TPOT rating scale. Reflection session online. **Mutual Support** includes solving disagreements and conflicts in teams.

Abbreviations: IPASS, Illness, Patient Summary, Action list, Situation awareness, Synthesis by the receiver; ISBAR, Identification, Situation, Background, Assessment, Recommendation; TPOT, TeamSTEPPS® Team Performance Observation Tool.

knowledge and experiences, what they think, how they feel and why (Polit & Beck, 2021).

A semi-structured interview guide with three themes was used and was initially tested with a group of three faculty members. The pilot interview aimed to assess the online settings. Further, we examined the interview guide's openness and quality to meet the study aim. No changes were required based on the feedback from the pilot interview. One moderator (TK) (male) and assistant moderator (RB) (female) performed all the interviews. The interview guide consisted of three themes:

- Experiences of the TeamSTEPPS® teamwork skills.
- Experiences of the teamwork learning activities at the campus.
- Experiences regarding how the teamwork skills were used in clinical practice.

Owing to the COVID-19 pandemic, the interviews were conducted online using Zoom software, which displayed the participants' video and audio in real time. The interviews were audio-recorded.

The interview commenced by the moderators presented themselves and explained the research's aim to make the students feel comfortable in the interview settings. The assistant moderator took notes during the interview and summarized them at the end to check if anything was misunderstood or required correction. Both moderators were skilled in conducting interviews and asking open-ended follow-up questions to obtain an additionally detailed description of their initial experiences or to invite the group to comment on each other's experiences. The interviews lasted between 45 and 64 min.

4.6 | Data analysis

The first author transcribed the recorded interviews verbatim (Polit & Beck, 2021). Subsequently, the data analyses were based on

Elo and Kyngäs' (2008) inductive content analysis and conducted in three phases: preparation, organization, and reporting (Elo & Kyngäs, 2008). We used Nvivo software (QSR International, 2020) to facilitate the analysis. During the preparation phase, each interview's content was defined as one unit of analysis. The four authors read all interviews to familiarize themselves with the data (Polit & Beck, 2021). In the organization phase, all meaning units ($N = 198$) were identified, openly coded and grouped according to meaning similarities. We gathered the groups of codes that shared the same meaning into subcategories. Subsequently, these subcategories were combined into higher-order generic categories to obtain internal homogeneity; they were mutually exclusive. The authors went back and forth between the transcribed data and the categories to examine the fairness of the codes extracted from the transcript and ensure the representativeness of labeling the chosen subcategory. Finally, one main category was abstracted from the generic categories.

The reporting phase involved presenting the analysis process and findings (Elo & Kyngäs, 2008). The credibility was emphasized by the reporting quotations that were essential to the text. Additionally, the research process was reported according to the EQUATOR checklist: COnsolidated criteria for REporting Qualitative research (COREQ) checklist (Tong et al., 2007) to support the findings' trustworthiness.

4.7 | Ethical considerations

This study was approved by the Norwegian Centre for Research Data (NSD ref.nr. 758392). The university department head provided the field access. Participation was based on written informed consent, and the study was conducted according to the Declaration of Helsinki (World Medical Association, 2018). During transcription, clinical placements were anonymized, and the students' names were replaced with a code where the capital letters and numbers indicated the interview and the student, respectively (A1, B3, C2). The data were stored on the first author's personal folder at the university's server and secured with passwords.

The first author (TK) met the students at various learning activities as a researcher during the intervention. However, during this period, none of the moderators evaluated the students during any course or clinical placement.

5 | FINDINGS

5.1 | Participants

Overall, 22 participants (17 women and 5 men) attended 6 focus group interviews, with 2 to 5 students in each group. The students' ages ranged from to 20–33 years, with a median age of 23 years. Twelve students had previous work experience before attending the bachelor's program. Twenty-one students worked part-time as nursing assistants in various healthcare institutions during their leisure time.

5.2 | Main category

Learning teamwork is not an event, it's a journey emerged as the main category to describe an overall abstraction of the students' team training and teamwork experiences. It was indicated that understanding the team training's relevance and the teamwork skills requires time. As the intervention progressed and the students achieved more clinical experience, awareness of the relevance and impact of using teamwork skills increased. The students experienced the utilization of teamwork skills to influence their awareness of being team members and to facilitate learning. Table 3 shows an overview of the generic and subcategories.

5.3 | Generic categories and subcategories

5.3.1 | Grasping the relevance of team training and the principle of teamwork takes time

This generic category was derived from three subcategories.

Complex and theoretical...in the beginning
Teamwork and the TeamSTEPPS® team training concept were initially identified as being complex and theoretical. The students did not comprehend how and when to employ the teamwork skills in practice. "At the start of my education, I could not entirely imagine how I would use my team skills" (D2). The students were engaged in honing their basic nursing skills and using the study time on anatomy and physiology courses, where they were required to pass an exam. They experienced the team training intervention as an overload of theory and concepts that they had to organize to focus on the learning outcomes considered more important.

Repeated input over time increased understanding of teamwork's impact
As the bachelor's program evolved and the various TeamSTEPPS® skills were introduced and repeated in numerous contexts, awareness increased to the extent where teamwork skills were used in nursing care. One student reported that the TeamSTEPPS® intervention "has helped to increase my understanding that it is not just about training in a nurse-patient role, but we also get trained in the nurse-to-nurse aspect and it really is a huge part of the job" (C2). The students picked up teamwork skills along the way; however, they could not view the entire picture of the TeamSTEPPS® principles until the fifth semester. The intervention provided them with words to describe their prior and present teamwork experiences and brought tacit knowledge to their consciousness. One student said: "I have sort of used those tools before, but when they get a name and you learn about it, you became more aware of it as well, and you continue to use the tools" (B1).

TABLE 3 Categories.

Main category	Generic category	Subcategories
Learning teamwork is not an event; it's a journey	Grasping the relevance of team training and the principle of teamwork takes time	Complex and theoretical...in the beginning
		Repeated input over time increased the understanding of the teamwork's impact
		Practising structured communication increased the understanding of the team training's objectives
	Facilitates awareness of being a team member	Being informed, noticed, and listened to evokes the feeling of being included
		Providing feedback to supervisors may be challenging
		Hierarchy and severity of care affect the behaviour and role
		To achieve a task, make you become a team member
	Facilitates learning	Need to be prepared; Practically and mentally
		A good relationship with the supervisors was essential
		Concrete feedback using professional arguments improves learning
		Team leadership training and delegating tasks are often outside one's comfort zone
		Awareness of how various teamwork skills are used in different units

Practising structured communication increases understanding of the team training's objectives

The handover process became structured, and the relevant information was easier to organize when transferring patient information within the team, to other units or between shifts. The students experienced more control when using structured communication. One student stated: "I got an amazing feeling of mastery when I used ISBAR and closed the loop in an emergency situation after having completed the first aid training days" (A2). The supervisors appreciated the students' structured sharing of changes in the patient status, for example, using the ISBAR and the National Early Warning Score (NEWS) (The Royal College of Physicians, 2017). The students reported that closed-loop communication was explicitly employed in medical administration and other situations as security that the message was understood correctly, for the sender and receiver. One student mentioned: "If I use these tools, people think of my input as a bit more professional" (B1).

5.3.2 | Facilitates awareness of being a team member

This generic category was derived from four subcategories.

Being informed, noticed, and listened to evokes the feeling of being included

The use of teamwork skills in clinical placements facilitated the awareness of being a team member. To "be seen" by the team leader had an influence on the feeling of being a team member and became even more robust when the team leader used the student's name. One student expressed: "Follow-up from our team leader and ongoing updates makes you feel like part of the team" (A4). In the middle of their shift, the huddling sessions were expressed as vital

to sharing information within the team. If they accidentally missed it, information about "their patients" might not be shared at all or until later. Thus, missing the information and decisions made in the huddling session made the students feel excluded from the team. However, they felt included when the clinical team invited them to share their views of a patient care plan and to participate in new clinical care tasks to learn. One student shared the following experience from a clinical placement: "The whole unit is a team; we all talk, discuss, and listen to each other, even if you are a nursing student. We wait until it is our turn. We ask each other questions. I LOVE that unit!" (F3).

Providing feedback to supervisors may be challenging

Questions were reported to be the most comfortable way to provide feedback to the supervisors of their thoughts regarding alternative approaches to nursing care. However, it was easier to ask curious questions than those perceived as doubting the supervisors' care choice or knowledge. One student stated: "I'm good at asking inquisitive questions, but it's those more critical questions that are more challenging to formulate in a good way. Just so it doesn't get read as an attack, maybe, against the nurse I'm with" (D4). The students were afraid that expressing negative criticism might affect their evaluations, possibly leading to a grade of "not passed." Additionally, some students were afraid of "stepping on the toes" of a healthcare professional with more power. Other students expressed that they might not have the complete information and knowledge to question the supervisors' decisions and tended to think that they most likely had a well-considered foundation for their choices.

The hierarchy and severity of care affects behaviour and roles

The students expressed the self-efficacy of their knowledge and skills and hierarchical factors that influence which function and

tasks they choose to be involved in during clinical placements. For example, when they participate in emergencies, they may be reluctant to share their view of the quality of care, especially if the nurses or doctors demonstrate authoritative behaviour. One student expressed: "It's not easy to have confidence in your own knowledge in emergency situations, especially if you think something different to those in charge – that's when I take a step back" (E1). All supervisors were not similarly interested in hearing the students' views on how to perform nursing care. Likewise, the nursing students felt inferior; they were at the clinical placement to learn, making it slightly scary to be especially visible when essential decisions about nursing care were made.

To achieve a task make you become a team member

When the students were delegated specific tasks, it was easier to consider themselves as team members. One student experienced an increased awareness of being part of a team after attending nursing education than from previous work experience. Clear roles and an attentive team leader contributed to this awareness. Furthermore, asking questions was a role the students experienced as contributing to patient safety. For example, a student expressed: "Asking questions is also a crucial role in the team – an extra safety in a way" (B2).

5.3.2 | Facilitates learning

This generic category was retrieved from five subcategories.

Need to be prepared: Practically and mentally

Before attending a nursing care situation, briefing was experienced as essential to their learning. A student reported: "Even simple tasks can become difficult if you are not mentally and practically prepared" (E3). The students experienced a significant variation among the supervisors concerning how they employed briefing before a learning activity in clinical practice. They believed that briefing prepared them and the supervisor for a mutual understanding of the task, teamwork, the former's role in the team, and the patient care goals. One student stated: "Planning the day leads to creating a shared plan and goals and we can step in for each other" (E2). Sharing plans during the briefing and huddling was experienced as a patient safety act to either get their plan accepted, initiate a discussion to form an improved strategy, or have a space for asking questions about patient care.

A good relationship with the supervisors was essential

This was experienced as essential to lower the student's threshold for asking questions and voicing their opinions. Additionally, the supervisor's support, how well the supervisor knew the student, and how they communicated were vital regarding which role they attended in the patient meetings. If they had to change roles after entering the patients' room, they could use non-verbal communication; as one student expressed: "You build this sort of non-verbal communication when you know each other and eventually you have these kinds of signs you can give each other" (E2). However, having multiple supervisors during a clinical placement could jeopardize the psychological safety required for the students to raise their voice in patient safety issues, attend to new or complex care situations, and ask for help.

Concrete feedback using professional arguments improves learning

Specific and timely feedback, preferably with suggestions for improvement, motivated the students to change their behaviour and attitude toward their standard of care. Nevertheless, feedback that was extremely general or underestimated the student's competence was of insufficient value. One student mentioned: "I learn from concrete and constructive feedback that has a professional basis – not from general comments or feedback long after we've worked together" (E1). The students experienced significant variations among the supervisors in initiating feedback during and after a clinical situation. A good relationship made it easier to ask for feedback, if the supervisor did not initiate it.

Team leadership training and delegating tasks are often outside one's comfort zone

The students had ambivalent experiences with team leadership training. They felt more comfortable as team leaders when they were explicitly supported as trainees. As one student expressed: "Delegating is easier if the people around you are there to learn – it's easier to assign work" (B1). The responsibility of leading and delegating was occasionally overwhelming if there were excessive leadership tasks. However, the students believed that it was safe to have the supervisor for support. Delegating tasks to a person higher in the hierarchy could feel slightly unpleasant regarding whether they had sufficient knowledge to do so; nonetheless, they never experienced being alone with the responsibility. The students knew they were approaching graduation and soon had to take responsibility as team leaders. This awareness led to an ambivalence between team leadership and bedside patient trainings as they needed to achieve confidence and cope with the nursing skills.

Awareness of how various teamwork skills are used in different units

The TeamSTEPPS® intervention taught the students best-practice teamwork and raised their awareness of how various teamwork skills were employed in diverse clinical units. One student stated: "The TeamSTEPPS team training increased my awareness of the role of various people during the clinical placements at the hospital, how they fulfil their roles, and which tools they utilize" (E1). They attained a toolbox for further teamwork as graduated nurses. Even if they were unaware of teamwork prior to attending the bachelor's degree of nursing education or early clinical placements, they reflected on it retrospectively. What they observed and experienced elevated their awareness of teamwork quality. One student expressed: "In the psychiatric care clinical placement,

they focused on teamwork; they used the same principles as in the TeamSTEPPS" (D1).

6 | DISCUSSION

This study aimed to describe how nursing students experienced a longitudinal team training program and the teamwork skills used in clinical practice. Our findings showed that although team training was initially experienced as theoretical and complex, it increased the students' awareness of teamwork skills, even though it required time. Additionally, the students identified teamwork skills as vital to feel included in the team and facilitate learning and patient safety.

The six competencies to improve quality and safety in 21st-century health care include teamwork, and patient-centred care, evidence-based practice, quality improvement, safety, and informatics (Cronenwett et al., 2007). Benner et al. (2010) argued that it might be difficult to expect students to absorb excessive knowledge in a limited time. Students often find the first year of nursing education to be stressful (Thorkildsen & Råholm, 2010). To avoid cognitive overload, new learning should build upon previous knowledge (van Merriënboer & Sweller, 2010). There is no consensus on the optimal timing and sequencing of a longitudinal team training intervention in nursing bachelor's degrees (Ross et al., 2020). However, it is recommended that learning teamwork skills should be implemented from the first year of nursing education and divided across the semesters (AHRQ, 2015; Barton et al., 2018). Our study has demonstrated that the students require time to embrace the awareness of how teamwork affects nursing care. Professional and teamwork competencies are interrelated and may reinforce each other (Sherwood, 2017). Jeppesen et al. (2017) found that students' learning in simulation laboratories is facilitated when stimulated as teamwork. When teamwork is introduced from the first year, it should be linked to achieving the learning outcomes of professional skills to ensure its relevance. When students receive additional clinical practice, team training could be connected to effectiveness and patient safety. Our findings should be considered when team training is implemented in the bachelor's degree of nursing education.

Structured communication is the glue of teamwork and a foundation for performing leadership, situation monitoring, and mutual support (AHRQ, 2019; King et al., 2008). The TeamSTEPPS® intervention emphasized structured communication training from the first semester; it was the most repeated skill of our team training intervention. It was embraced by the students and experienced as being professional. Previous research has demonstrated that communication is the most trained teamwork ability (Foster et al., 2019). The respondents in Ross et al.'s (2021) research support this study's findings, as the students were comfortable using structured communication during transfers and found it helpful in communicating with other professionals. Moreover, it improves patient safety during handovers (Lewis et al., 2021). Our findings show that the students considered sharing information to be vital for feeling included in the team. Further, belonging is a prerequisite for clinical learning (Baixinho et al., 2022).

The TeamSTEPPS® curriculum emphasizes that sharing information is essential for creating a shared mental model (King et al., 2008), described as the "individually held knowledge structures that help team members function collaboratively in their environments" (McComb & Simpson, 2014, p. 1485). Establishing such a model within the team includes task work and teamwork (AHRQ, 2019) to ensure efficient and safe care (Wu, 2018). The students considered asking questions contributing to patient safety, both during the shift and in a more structured way during briefing, huddling, and debriefing. Chapelain et al. (2015) found that the ability to ask questions and share information appeared to contribute to care delivery. Asking questions was a way of providing feedback to improve learning and patient safety. The students believed that providing feedback to supervisors required psychological safety and faith in their knowledge. Psychological safety involves the students feeling comfortable sharing concerns and mistakes without being humiliated, ignored or punished (Edmondson, 2019) and is essential to facilitate information sharing and patient safety (Weller et al., 2014). Similarly, Huehn et al. (2020) reported that students found it difficult to challenge superiors. Although being assertive and standing up in the best interests of the patient is theoretically simple, students remained concerned about managing conflicts even with the TeamSTEPPS® tools. Knowing the best behaviour, but actually practising it, is not easy and might indicate insufficient psychological safety (Edmondson, 2019). This has inspired us to focus more on conflict management in future team training. This study's findings are supported by Chicca and Shellenbarger (2020) who found that briefing and clarifying roles before a patient situation creates psychological safety and sets students up for success. Speaking up when concerned about patient safety issues is part of mutual support in teamwork (AHRQ, 2019). Training on providing feedback by asking questions is an essential component of the TeamSTEPPS® intervention. However, psychological safety and the students' consideration of what is at stake by voicing their concerns influenced their choice of action (Edmondson, 2019), which may vary from training in a simulated context to a clinical context.

The students reported that a good relationship with the supervisors who provided concrete feedback was essential to their learning. Such an association creates a foundation for psychological safety and learning (Edmondson, 2019). Feedback has been a well-established practice in simulation pedagogic and team training (Filomeno & Minciullo, 2021) and has been significant for supervision in clinical training (Lefroy et al., 2015). However, Wisniewski et al. (2019) found that there is significant variance in the feedback effect. Feedback is more effective the more information it contains. Feedback containing information regarding the task, process or self-regulation was identified as the most influential contribution to learners' knowledge (Hattie & Timperley, 2007; Wisniewski et al., 2019). Feedback must encourage the development of self-reflection to view students' experiences in a climate of learning (Lefroy et al., 2015). This approach fosters a culture of learning and patient safety that is congruent with lifelong learning; it is crucial to the students' future as graduated nurses working in a complex healthcare service (Benner et al., 2010).

Training team leadership and delegating tasks were experienced as teamwork skills outside the students' comfort zone that require practice. To be motivated to learn and attain self-efficacy, students must hold positive outcome expectancies and be part of a supportive environment (Ambrose et al., 2010). Training team leadership is a learning outcome, primarily in the students' fifth clinical placement as seniors. Leadership tools, such as briefing and debriefing, were familiar to them as learning tools in simulated settings and through the structure of being in supervised clinical practice. Delegating tasks was a minor part of the intervention; however, leadership tools, such as role clarity, briefing, huddling, and debriefing, were used from the team training's first semester to facilitate learning. Similarly, the students considered these tools vital to learning and sharing information and knowledge in clinical placements. Training leadership may reduce the gap from being a student to being a registered nurse. Démeh and Rosengren (2015) found that nursing students in their last year of a bachelor's program wished they had engaged in leadership content early in the education process. Leadership is a key component of the TeamSTEPPS® principles for effective and safe patient care (AHRQ, 2019).

6.1 | Strengths and limitations

A strength of this study was the longitudinal integration of team training into all relevant courses of the bachelor's degree in nursing education for 26 months with extensive faculty involvement. However, research on the timing and implementation strategy of a curriculum-wide integration of team training should be further explored. The focus group interviews provided a thorough description of students' experiences with the team training program (Kitzinger, 1995); to our knowledge, this is the first study to use this data collection method to explore nursing students' experiences of a longitudinal team training intervention. The comprehensive description of the research process has strengthened its credibility. The transferability of findings may be relevant to similar cultural contexts and settings (Polit & Beck, 2021).

A limitation of this research may be the utilization of online focus group interviews that could have restrained the students from sharing their experiences, due to technical issues and being in different locations (Woodyatt et al., 2016). Participation in the study was voluntary, and those who decided to partake might be those who were the most satisfied with the intervention. The COVID-19 pandemic might have influenced the students' experiences and limited the dependability of findings in a context without interaction restrictions.

6.2 | Recommendations for future research

Further research should explore the sequencing and motivational factors that render a team training experience relevant to first-year students.

7 | CONCLUSION

This study found that team training raised students' awareness of teamwork as an essential part of being a professional nurse. However, understanding and awareness take time. Acquiring teamwork knowledge and skills initially competed with the students' need to gain professional-specific understanding and abilities. A supportive learning environment that stimulates their psychological safety is required to transfer teamwork knowledge to behaviour in clinical placements. A longitudinal and sequential implementation of teamwork skills should be integrated to improve students' learning of nursing tasks and teamwork to promote quality and patient safety.

8 | RELEVANCE TO CLINICAL PRACTICE

This study's findings should be informative to those who plan to implement team training in their Bachelor of Nursing programs. When the TeamSTEPPS® team training skills are implemented from the first year, the relevance of teamwork to the learning process appears essential to motivate first-year students to employ teamwork skills. Team training and the training of professional nursing skills should be intertwined and could further support the learning process for the practice of efficient and safe patient care.

ORCID
Tore Karlsen https://orcid.org/0000-0002-1389-3472
Marie Louise Hall-Lord https://orcid.org/0000-0003-3385-3731
Sigrid Wangensteen https://orcid.org/0000-0002-2278-9968
Randi Ballangrud https://orcid.org/0000-0003-0403-0509

REFERENCES
Aase, I., Aase, K., & Dieckmann, P. (2013). Teaching interprofessional teamwork in medical and nursing education in Norway: A content

analysis. *Journal of Interprofessional Care*, 27(3), 238–245. https://doi.org/10.3109/13561820.2012.745489

AHRQ. (2014). *Team performance observation tool*. Agency for Healthcare Research and Quality. http://www.ahrq.gov/teamstepps/longtermcare/sitetools/tmpot.html

AHRQ. (2015). *From evidence to action: TeamSTEPPS strategies for nursing education* [Webinar]. TeamSTEPPS webinar. https://www.ahrq.gov/teamstepps/webinars/previous-webinars-2015.html

AHRQ. (2017). *TeamSTEPPS implementation guide*. https://www.ahrq.gov/teamstepps/instructor/essentials/implguide.html

AHRQ. (2019, June 2019). *TeamSTEPPS 2.0*. Agency of Health Research and Quality. https://www.ahrq.gov/teamstepps/curriculum-materials.html

Ambrose, S. A., Bridges, M. W., DiPietro, M., Lovett, M. C., & Norman, M. K. (2010). *How learning works: Seven research-based principles for smart teaching*. John Wiley & Sons.

Baixinho, C. L., Ferreira, Ó. R., Medeiros, M., & Oliveira, E. S. F. (2022). Sense of belonging and evidence learning: A focus group study. *Sustainability*, 14(10), 5793. https://doi.org/10.3390/su14105793

Barton, G., Bruce, A., & Schreiber, R. (2018). Teaching nurses teamwork: Integrative review of competency-based team training in nursing education. *Nurse Education in Practice*, 32, 129–137. https://doi.org/10.1016/j.nepr.2017.11.019

Benner, P., Suthpen, M., Loenard, V., & Day, L. (2010). *Educating nurses: A call for radical transformation* (Vol. 3). Jossey-Bass.

Cant, R., Ryan, C., Hughes, L., Luders, E., & Cooper, S. (2021). What helps, what hinders? Undergraduate nursing students' perceptions of clinical placements based on a thematic synthesis of literature. *SAGE Open Nursing*, 7, 23779608211035845. https://doi.org/10.1177/23779608211035845

Chapelain, P., Morineau, T., & Gautier, C. (2015). Effects of communication on the performance of nursing students during the simulation of an emergency situation. *Journal of Advanced Nursing*, 71(11), 2650–2660. https://doi.org/10.1111/jan.12733

Chicca, J., & Shellenbarger, T. (2020). Fostering inclusive clinical learning environments using a psychological safety lens. *Teaching and Learning in Nursing*, 15(4), 226–232. https://doi.org/10.1016/j.teln.2020.03.002

Cronenwett, L., Sherwood, G., Barnsteiner, J., Disch, J., Johnson, J., Mitchell, P., Sullivan, D. T., & Warren, J. (2007). Quality and safety education for nurses. *Nursing Outlook*, 55(3), 122–131. https://doi.org/10.1016/j.outlook.2007.02.006

Démeh, W., & Rosengren, K. (2015). The visualisation of clinical leadership in the content of nursing education—A qualitative study of nursing students' experiences. *Nurse Education Today*, 35(7), 888–893. https://doi.org/10.1016/j.nedt.2015.02.020

Edmondson, A. (2019). The role of psychological safety: Maximizing employee input and commitment. *Leader to Leader*, 2019(92), 13–19. https://doi.org/10.1002/ltl.20419

Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process [article]. *Journal of Advanced Nursing*, 62(1), 107–115. https://doi.org/10.1111/j.1365-2648.2007.04569.x

Filomeno, L., & Minciullo, A. (2021). High-fidelity simulation for the education of nursing students: A scoping review of the literature. *Professioni Infermieristiche*, 74(2), 180–189. https://doi.org/10.7429/pi.2021.7423180

Foster, M., Gilbert, M., Hanson, D., Whitcomb, K., & Graham, C. (2019). Use of simulation to develop teamwork skills in prelicensure nursing students: An integrative review. *Nurse Educator*, 44(5), E7–E11. https://doi.org/10.1097/NNE.0000000000000616

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, 77(1), 81–112. https://doi.org/10.3102/003465430298487

Huehn, S. L., Beth Kuehn, M., & Fukunaga Luna Victoria, G. M. (2020). Implementation of the TeamSTEPPS curriculum with baccalaureate nursing and social work students utilizing student trainers: A qualitative and quantitative study. *Creative Nursing*, 26(3), e63–e69. https://doi.org/10.1891/CRNR-D-19-00024

Jeppesen, K. H., Christiansen, S., & Frederiksen, K. (2017). Education of student nurses – A systematic literature review. *Nurse Education Today*, 55, 112–121. https://doi.org/10.1016/j.nedt.2017.05.005

Kaiser, J. A., & Westers, J. B. (2018). Nursing teamwork in a health system: A multisite study. *Journal of Nursing Management*, 26(5), 555–562. https://doi.org/10.1111/jonm.12582

Karlsen, T., Hall-Lord, M. L., Wangensteen, S., & Ballangrud, R. (2022). Bachelor of nursing students' attitudes toward teamwork in healthcare: The impact of implementing a TeamSTEPPS® team training program—A longitudinal, quasi-experimental study. *Nurse Education Today*, 108, 105180. https://doi.org/10.1016/j.nedt.2021.105180

King, H. B., Battles, J., Baker, D. P., Alonso, A., Salas, E., Webster, J., Toomey, L., & Salisbury, M. (2008). TeamSTEPPS: Team strategies and tools to enhance performance and patient safety. In K. Henriksen, J. B. Battles, M. A. Keyes, & M. L. Grady (Eds.), *Advances in patient safety: New directions and alternative approaches* (Vol. 3). Agency for Healthcare Research and Quality. https://www.ncbi.nlm.nih.gov/books/NBK43686/

Kitzinger, J. (1995). Qualitative research: Introducing focus groups. *BMJ*, 311(7000), 299–302. https://doi.org/10.1136/bmj.311.7000.299

Lefroy, J., Watling, C., Teunissen, P. W., & Brand, P. (2015). Guidelines: The do's, don'ts and don't knows of feedback for clinical education. *Perspectives on Medical Education*, 4(6), 284–299. https://doi.org/10.1007/s40037-015-0231-7

Lewis, K. D., McConkey, S., & Patel, S. J. (2021). Handoffs: Reducing harm through high reliability and interprofessional communication. In R. K. Shah & S. A. Godambe (Eds.), *Patient safety and quality improvement in healthcare: A case-based approach* (pp. 207–217). Springer International Publishing. https://doi.org/10.1007/978-3-030-55829-1_11

Maguire, M. B. R., Bremner, M. N., Bennett, D. N., & VanBrackle, L. (2015). Evaluation of TeamSTEPPS integration across a curriculum regarding team attitudes: A longitudinal study. *Journal of Nursing Education and Practice*, 5(7), 131. https://doi.org/10.5430/jnep.v5n7p131

Maneval, R. E., Vermeesch, C., Poindexter, K., Lourens, G., & Ventura-Dipersia, C. (2020). Developing interprofessional competence: Results of embedding TeamSTEPPS® in all semesters of an accelerated and traditional BSN program. *Nursing Education Perspectives*, 41(4), 249–252. https://doi.org/10.1097/01.NEP.0000000000000572

McComb, S., & Simpson, V. (2014). The concept of shared mental models in healthcare collaboration. *Journal of Advanced Nursing*, 70(7), 1479–1488. https://doi.org/10.1111/jan.12307

Norwegian Ministry of Health and Care Services. (2019). *The national health and hospital plan 2020–2023*. Ministry of Health and Care Services. https://www.regjeringen.no/en/dokumenter/meld.-st.-7-20192020/id2678667/

Oandasan, I., Ross Baker, G., Barker, K., Bosco, C., D'Amour, D., Jones, L., Kimpton, S., Lemieux-Charles, L., Nasmith, L. S., Martin-Rodriguez, L., Tepper, J., & Way, D. (2006). *Teamwork in healthcare: Promoting effective teamwork in healthcare in Canada. Policy synthesis and recommendations*. Canadian Health Services Research Foundation.

Polit, D. F., & Beck, C. T. (2021). *Nursing research: Generating and assessing evidence for nursing practice* (11th ed., International edition). Lippincott Williams & Wilkins.

QSR International. (2020). *NVivo* (*version 20.3.0.535*). https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home

Reeves, S., Palaganas, J., & Zierler, B. (2017). An updated synthesis of review evidence of interprofessional education. *Journal of Allied Health*, 46(1), 56–61.

Ross, J. G., Latz, E., Meakim, C. H., & Mariani, B. (2021). TeamSTEPPS curricular-wide integration: Baccalaureate nursing students' knowledge, attitudes, and perceptions. _Nurse Educator, 46_(6), 355–360. https://doi.org/10.1097/NNE.0000000000000999

Ross, J. G., Meakim, C., & Hohenleitner, S. G. (2020). Outcomes of TeamSTEPPS training in prelicensure health care practitioner programs: An integrative review. _Journal of Nursing Education, 59_(11), 610–616. https://doi.org/10.3928/01484834-20201020-03

Sherwood, G. (2017). Driving forces for quality and safety, changing mindsets to improve health care. In G. Sherwood & J. Barsteiner (Eds.), _Quality and safety in nursing: A competency approach to improving outcomes_ (2nd ed.). Wiley-Blackwell.

The European Parliament, & the Council of the European Union. (2013). _Directive 2013/55/EU of the European Parliament and of the council of 20. November 2013 amending Directive 2005/36/EC on the recognition of professional qualifications._ http://data.europa.eu/eli/dir/2005/36/2013-07-01

The Royal College of Physicians. (2017). _National Early Warning Score (NEWS) 2, Standardising the assessment of acute-illness severity in the NHS. (Working party report)._ https://www.rcplondon.ac.uk/projects/outputs/national-early-warning-score-news-2

Thorkildsen, K., & Råholm, M. B. (2010). The essence of professional competence experienced by Norwegian nurse students: A phenomenological study. _Nurse Education in Practice, 10_(4), 183–188. https://doi.org/10.1016/j.nepr.2009.08.003

Tong, A., Sainsbury, P., & Craig, J. (2007). Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. _International Journal for Quality in Health Care, 19_(6), 349–357. https://doi.org/10.1093/intqhc/mzm042

van Merriënboer, J. J. G., & Sweller, J. (2010). Cognitive load theory in health professional education: Design principles and strategies. _Medical Education, 44_(1), 85–93. https://doi.org/10.1111/j.1365-2923.2009.03498.x

Weaver, S. J., Dy, S. M., & Rosen, M. A. (2014). Team-training in healthcare: A narrative synthesis of the literature. _BMJ Quality and Safety, 23_(5), 359–372. https://doi.org/10.1136/bmjqs-2013-001848

Weller, J., Boyd, M., & Cumin, D. (2014). Teams, tribes and patient safety: Overcoming barriers to effective teamwork in healthcare.

Postgraduate Medical Journal, 90(1061), 149–154. https://doi.org/10.1136/postgradmedj-2012-131168

Wisniewski, B., Zierer, K., & Hattie, J. (2019). The power of feedback revisited: A meta-analysis of educational feedback research. _Frontiers in Psychology, 10_, 3087. https://doi.org/10.3389/fpsyg.2019.03087

Woodyatt, C. R., Finneran, C. A., & Stephenson, R. (2016). In-person versus online focus group discussions: A comparative analysis of data quality. _Qualitative Health Research, 26_(6), 741–749. https://doi.org/10.1177/1049732316631510

World Health Organization. (2011). _Patient safety curriculum guide multiprofessional edition._ World Health Organization. https://www.who.int/patientsafety/education/mp_curriculum_guide/en/

World Medical Association. (2018, 9 July 2018). _WMA Declaration of Helsinki- Ethical principles for medical research involving human subjects._ https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/

Wu, A. W. (2018). Reaching common ground: The role of shared mental models in patient safety. _Journal of Patient Safety and Risk Management, 23_(5), 183–184. https://doi.org/10.1177/2516043518805326

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

> **How to cite this article:** Karlsen, T., Hall-Lord, M. L., Wangensteen, S., & Ballangrud, R. (2023). Bachelor of nursing students' experiences of a longitudinal team training intervention and the use of teamwork skills in clinical practice—A qualitative descriptive study. _Nursing Open, 10_, 5616–5626. https://doi.org/10.1002/nop2.1806