RESEARCH ARTICLE

Impact of palliative care simulation on nursing students' learning outcomes and reported use in hospital placement

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Abstract

Aim: Nursing students report emotional distress and feelings of inadequacy to the complexity of palliative care. This study aimed to examine nursing students' attainment of learning outcomes in palliative care through simulation and hospital placement.

Design: A longitudinal, intervention study.

Methods: Fifty-five second-year bachelor nursing students participated. Three waves of assessments were performed: (1) pretest; (2) postsimulation test and (3) postplacement test after the completion of the placement. Non-parametric Wilcoxon's signed-rank test for paired samples was used to test for differences between assessments of knowledge, skills and competence before and after simulation, and between postsimulation and post hospital placement.

Results: The results showed positive differences between pre- and postsimulation, indicating that learning outcomes were attained through simulation. However, negative differences between the postplacement test and postsimulation test scores indicated that the participants had practiced learning outcome from the simulation to a small degree during placement.

KEYWORDS

hospital placement, nursing education, nursing students, palliative care, simulation, transfer of learning

1 | INTRODUCTION

When a patient's life is coming to an end, the World Health Organization (WHO) recommends palliative care to promote quality of life through symptom control and mental, social or existential support for the patient and family (WHO, 2014). Death is one of life's most vulnerable moments, and the palliative approach has been shown to enhance quality of life to a greater extent than usual

practice (Holmenlund et al., 2017). According to the WHO's global atlas (Worldwide Palliative Care Alliance & WHO, 2014), only approximately 14% of the world population receives palliative care when needed. The report presents education as an important element for increasing access to palliative care. Nurses and nursing students are frontline care providers. Many students are young and face death for the first time in life during nursing education. Emotional distress and feelings of inadequacy are reported, and the complexity of the

necessary competence in palliative care make such competence challenging to learn and perform (Hall-Lord et al., 2017; Henoch et al., 2017; Jeppesen et al., 2017; Zhou et al., 2021). Research recommends simulation as one learning approach. This study focuses on whether students transfer learning outcomes from simulations to placements.

2 | BACKGROUND

In European nursing education, the variety of knowledge domains in education are divided into learning outcomes described as knowledge, skills and competence following recommendations from the European Qualifications Framework for Lifelong Learning (European Parliament Council, 2008). In the scope of palliative care, nursing students need to learn about physical conditions, symptom management, communication, psychosocial elements and life closure skills. The ability to co-operate in an interdisciplinary team with good interpersonal communication skills is essential. In addition, healthcare providers must control their own reactions to death and dying (Gamondi et al., 2013). Several studies have recommended an innovative learning approach involving the use of simulation to help nursing students learn core competencies in palliative care (Cant & Cooper, 2017; Kirkpatrick et al., 2017; Lippe & Becker, 2015; Smith et al., 2018; Venkatasalu et al., 2015). The state of the research is very limited (Smith et al., 2018). Simulation is characterized by learning objectives, fidelity, problem solving and support in a safe learning environment (Jeffries, 2016). The goal is to develop knowledge, skills and competency, and a transformative learning process is an important element (Clapper, 2010). Mezirow (2018) describes that transformative learning happens when a disoriented dilemma transforms habits of mind or problematic frames of references. A transformation of meaning perspectives can occur through critical reflection over the situation and affects the person's ability to change their mindset and behaviour in the future. When students participate in palliative care simulation, they bring frames of reference to the situation that are both positive and negative according to their earlier experiences in the field of palliative care. Nursing students who have participated in simulations of palliative care cases report increased knowledge about palliative care principles, improved communication skills, courage, self-confidence and positive attitudes towards palliative care (Smith et al., 2018; Valen et al., 2019; Venkatasalu et al., 2015). Stroup (2014) emphasizes that the potential gains in critical thinking and confidence are not beneficial to the student if they occur only in the laboratory. Whether the students use their former learning in simulation, and the learning outcomes from simulation in placement can be viewed in light of the Perkins and Salomon (2012) framework for analysing whether learning transfers from one situation to another. This framework suggests that to foster transfer of learning, the learner needs to detect a potential relationship with previous learning, elect to pursue this relationship and identify a fruitful connection between previous learning and the current situation. The role of motivational and dispositional factors must also be included.

Most studies on palliative care simulation measure students' immediate reactions and satisfaction with training or knowledge, skills and attitudes gained from training (Smith et al., 2018). From an educational perspective, it is of interest to collect students' evaluations of their opportunities to practice the learning outcomes from palliative care simulation during hospital placement. Therefore, the aim of this study was to examine nursing students' self-reported development of knowledge, skills and competence in palliative care in the following learning trajectory: baseline, after simulation and after hospital placement. The following research questions were addressed:

1. How do nursing students self-report knowledge, skills and competence in palliative care before and after simulation?
2. How do nursing students self-report their opportunities to practise the learning outcomes from palliative care simulation during hospital placement?

3 | METHODS

3.1 | Design

A longitudinal, intervention study with two independent implementations was conducted (Polit & Beck, 2017). The simulation intervention was administered during two following periods of eight-week hospital placement, where palliative care was one of the learning outcomes. The participants were divided into student group 1 and 2. Student group 1 took part in the simulation in their second week, while student group 2 participated in the simulation in week ten, which was their second week in the hospital placement. Three waves of assessments were performed: (1) pretest; (2) postsimulation test and (3) postplacement test after the completion of the placement. Table 1 shows an overview of the intervention steps.

3.2 | Recruitment

The participants were recruited from a university in Norway. The inclusion criteria were second-year nursing students entering medical

TABLE 1 An overview of the intervention and assessments performed in the study

Week of hospital placement	1 2 3 4 5 7 8		9 10 11 12 13 14 15 16	
Student group 1 (weeks 1–8)	T_0 S	T_2	T_0 S	T_2
Student group 2 (weeks 9–16)	T_1		T_1	

Note: T_0 Pretest before the simulation.
T_1 Post-test after completion of the simulation.
T_2 Postplacement test after completion of 8 weeks of hospital placement.
S, Simulation.

or surgical placement. The duration of clinical training in nursing education in Norway is half of the programme duration (Lahtinen et al., 2013). There were no exclusion criteria; however, the students had to participate voluntarily.

3.3 | Participants

Fifty-five of seventy-seven students (72%) voluntarily gave written consent to participate during their first or second hospital placement. Student group 1 had previously completed one placement in a nursing home, while student group 2 in addition had completed one placement in home care, hospital or mental health care. See Table 2 for the demographic data.

3.4 | Intervention

A three-hour simulation intervention took place at the university at the beginning of the participants' hospital placement in spring 2017. The design of the simulation intervention was based on the International Nursing Association for Clinical Simulation and Learning Standards of Best Practice: Simulation (INACSL Standards Committee[SM], 2016). The learning outcomes were consistent with core competencies in palliative care as described by Gamondi et al. (2013) and O'Connor (2016). The case-driven interventions were developed based on two focus-group interviews, one interview with third-year students and one interview with supervisors in placement to strengthen the relevance of the cases. The participants in the study were divided into nine groups consisting of six students; in each group, three students were observers, and three students were in action during the simulations, and the students alternated between the roles. For the learning outcomes and cases, see Table 3. The same participants conducted each case twice. The use of briefing and debriefing guides ensured consistency across the different groups. The participants were familiar with the learning method, and

TABLE 2 Demographic data of the sample

	Student group 1 & 2 $n = 55$
Age	**n (%)**
20–30	51 (93)
30–40	3 (5)
<40	1 (2)
Sex	
Female	48 (87)
Male	7 (13)
Former experience with palliative care	
Yes	28 (51)
No	27 (49)

they had received lectures about palliative care. The facilitators were experienced and trained as facilitators by Copenhagen Academy of Medical Education and Simulation.

3.5 | Data collection

Validated questionnaires to evaluate simulations in relation to nursing students' knowledge, skills and competence in palliative care are lacking (Smith et al., 2018). Therefore, ad hoc instruments were developed by the authors to obtain data on the participants' self-reported knowledge, skills and competence. The scoring alternatives were presented with a Likert Scale with a continuous response option from 0 to 10. The questionnaires were constructed based on the European Qualifications Framework on knowledge, skills and competence (European Parliament Council, 2008) and included items on core competencies in palliative care (Gamondi et al., 2013; O'Connor, 2016). The questions are listed in Table 4. Question 15 and 16 were not included in the postplacement test and are, therefore, not represented in Tables 6 and 7. The questionnaires were sent by email and answered electronically using the data programme Questback. Pretest and postsimulation test were collected on the day of simulation, while the postplacement test was collected after completion of 8 weeks of hospital placement. The response rate was as follows: completed both the pretest and postsimulation test, $n = 52$ (student group 1, $n = 28$; student group 2, $n = 24$). Completed both the postplacement test and postsimulation test, $n = 45$ (student group 1, $n = 23$; student group 2, $n = 22$).

3.6 | Data analysis

Statistical analysis was performed using Statistical Analysis Software (SAS University Edition). Due to the small sample size, a normal distribution could not be assumed. Therefore, the Wilcoxon signed-rank test (non-parametric test) was used to determine whether the participants' scores changed significantly due to the simulations and whether learning outcomes were practised during hospital placement (Altman, 1991). Statistically significant differences between student group 1 and student group 2 were tested using the Kruskal-Wallis test. $p < .05$ indicated statistical significance.

3.7 | Ethical considerations

All of the participants provided written consent after being informed orally and in writing about the study purpose, that it was voluntary, and their right to withdraw. Furthermore, that the study would be conducted in accordance with the ethical guidelines for nursing research in the Nordic countries (Northern Nurses Federation, 2003). In addition, that data would be treated confidentially (World Medical Association, 2013), and grades in placement would not be affected. The authors of this article were not facilitators of the simulation to

TABLE 3 Description of the simulation cases and learning outcomes used in this study

Simulation case and learning outcome
Patient: Jesper Jensen, 69 years old. Metastatic lung cancer. Hospitalized with poor general condition, pneumonia and pain. Treated with antibiotics and analgesics. No longer interested in food. Informed by the doctor of short life expectancy.
Case 1: Relational skills.   The students simulate that the nurse is taking away the antibiotic infusion, and offer the patient some food. Jensen is tired. He has realized that he is going to die soon, and is no longer interested in eating. Jensen's wife has a different view of the situation and requests tube feeding for her husband. A teacher act as standardized patient.   **Learning outcome**   **Knowledge:** knowledge of nutrition, relevant to the dying patient and relatives.   **Skills:** communicates about the patient's situation with patient and relatives.   Safeguards patient and wife's autonomy and integrity according to ethical and legal guidelines.   **General competence:** show respect, understanding and take other people's situation and experience seriously.
Case 2: Clinical assessment.   This case focussed on clinical assessment when Jensen is diagnosed as terminal. The wife is present. A High Fidelity Simulator is used.   **Learning outcome**   **Knowledge:** observe and evaluate clinical signs of a dying patient using the Edmonton Symptom Assessment System (ESAS).   **Skills:** initiate symptomatic relief in a dying patient.   **General competence:** ensure the dying patient and his relative's integrity and dignity in accordance with ethical and legal guidelines.

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avoid the opportunity that their roles as both facilitators and interviewers affected the interviews. The Norwegian Centre for Research Data approved the study (project number 48268).

3.8 | Validity and reliability

In the absence of a previously validated simulation case and related questionnaire to measure the outcomes in this study, we worked to strengthen the content validity (Polit & Beck, 2017) by welcoming third-year students, supervisors and lecturers to provide ideas to help develop the simulation cases. An expert panel of nurses in practice assessed the simulation cases. The cases were pilot-tested by third-year students and facilitators. The feedback from the pilot testing resulted in the development and use of briefing and debriefing guides for the facilitators to ensure equal implementation. Moreover, the participants recommended to make the learning outcomes more specific and reduce the number (from eleven to seven) to be in line with the cases and the time allotted. The students highlighted the need for information about consent for participation in the study, where taking part or withdrawal will have no consequences for

marks (pass/fail) in placement. Furthermore, the facilitators suggested to offer students' conversation with the teacher after the simulation to share feelings and emotions experienced during the palliative care simulation. The students participating in the pilot, also provided valuable information about the questionnaire in progress, suggesting to clarify the content and formulation of the items and the preferred measurement scale. The items were described as understandable and relevant. A continuous value scale with options from 0 to 10 and open-ended questions were recommended. The students appreciated a familiar rating scale, and the one used in this study is like the ESAS-r, which is an assessment tool used in clinical placement.

Self-reports can undermine validity due to informants' inability to remember what actually happened; even though self-reports are the gold standard for assessment (Polit & Beck, 2017). Observing the students or testing their knowledge, skills and competence might have added different perspectives to the study. To strengthen the construct validity (Polit & Beck, 2017) and capture the higher order that the learning outcomes and questionnaires were intended to represent, the European Qualifications Framework and palliative care guidelines were used (Gamondi et al., 2013; O'Connor, 2016).

In terms of reliability, the study may have had selection bias, as the participants were not randomized (Polit & Beck, 2017). Students who disliked simulation as a learning approach or wanted to avoid palliative care are perhaps not represented. Attrition is a problem in longitudinal studies that investigate the trajectory of a phenomenon over time (Polit & Beck, 2017). In this study, it is unknown how the attrition rate influenced the results. The study allowed for two independent implementations of the intervention, each with an eight-week duration. The participants were divided into nine groups of six students, and the results were comparable for each group. This approach may have enhanced the reliability of the study. We are aware that the Hawthorn effect may have had a positive impact on the results since the students knew they were being tested.

4 | RESULTS

For research question #1, "How do nursing students self-report knowledge, skills and competence in palliative care before and after simulation?" the Wilcoxon signed-rank test showed positive differences in the pretest and postsimulation test evaluation for all questions, indicating that overall, the simulation affected knowledge, skills and competence. The difference was constructed as the level of evaluation in the postsimulation test minus the level of evaluation in the pretest (Altman, 1991). Thus, a positive difference implies the simulation was considered useful for a specific question about knowledge, skills or competence (see Table 4). When we analysed whether there was a statistically significant difference in the evaluations between student group 1 and student group 2, the Kruskal-Wallis test yielded the following results: when we combined all knowledge questions into one sample, there was a statistically significant difference in knowledge between the student groups.

TABLE 4 Difference between schema 1 and schema 2 (pre- and postsimulation tests)

Question		Difference			Wilcoxon test	
		N	Mean	Median	W	p-value
Knowledge						
Pretest: To what degree do you have knowledge to; Post-test: Have you developed knowledge in simulation to;						
1. Observe and clinically assess signs that a patient is dying		52	3.81	3.5	652.5	<.0001
2. Inform a relative about clinical signs indicating that a patient is dying?		52	4.44	4	663	<.0001
3. Inform a patient about clinical signs indicating that he/she is dying?		52	5.00	5	685.5	<.0001
Skills						
Pretest: To what degree do you have skills to; Post-test: Have you developed skills in simulation to;						
4. Observe and clinically assess the patients' symptoms through ESAS-r schema?		52	3.56	3.5	577	<.0001
5. Initiate symptom management to a patent in pain?		52	3.73	3	585	<.0001
6. Initiate symptom management to a patient with nausea?		52	1.98	2	366	<.0001
7. Initiate symptom management to a patient with respiratory problems?		52	3.60	4	588.5	<.0001
8. Initiate symptom management to a restless patient?		52	2.77	3	426	<.0001
9. Communicate about the patients' situation to a dying patient?		52	4.44	4	637.5	<.0001
10. Communicate to the dying patient's relatives?		52	5.04	5	689	<.0001
11. Safeguard the patient's autonomy and integrity		52	3.33	3	633.5	<.0002
Competence						
Pretest: To what degree do you have competence to; Post-test: Have you developed competence in simulation to;						
12. Show respect to a dying patient?		52	3.77	4	609.5	<.0001
13. Show empathy to a dying patient?		52	3.48	4	609	<.0001
14. Take other people's situation and reactions seriously when talking to a dying patient and their relatives?		52	3.17	3	617	<.0001
15. Reflect over own ability to care for dying patients.		52	3.27	3	542	<.0001
16. Care for relatives to a dying patient		52	4.62	4.5	634	<.0001

Wilcoxon's signed rank test.

Student group 2 had a median difference of 5 between the pre- and postsimulation knowledge scores, while student group 1 had a median difference of 4, with a p-value = .0098. When we considered all skills questions as one sample, the effect was significantly larger in student group 2 than in student group 1. Student group 2 had a median difference of 4 between the pre- and postsimulation skills scores, and student group 1 had a median difference of 3, with a p-value = .0224. When we considered all competence questions as one sample, the result was just above the threshold value for significance (p-value = .0568). The result showed that student group 2 had a median difference of 4, while the corresponding median for student group 1 was 3 (see Table 5).

When we analysed the results from research question #2, "How do nursing students self-report their opportunities to practise the learning outcomes from palliative care simulation during hospital placement?" we found negative differences between the postplacement test and postsimulation test scores. The difference was constructed as the level of evaluation in the postplacement test minus the level of evaluation in the postsimulation test (Altman, 1991). A negative difference indicated that the participants had practised

TABLE 5 Difference schema 1 and schema 2 (pre- and postsimulation test) distributed on student groups

Difference	Group 1			Group 2			Kruskal-Wallis test	
Question	N	Mean	Median	N	Mean	Median	Chi-sq	p-value
1	28	3.39	3	24	4.29	4	3.447	.0634
2	28	4.18	4	24	4.75	4.5	1.6244	.2025
3	28	4.71	4.5	24	5.33	5	2.3535	.125
All knowledge	84	4.1	4	72	4.79	5	6.6774	.0098
4	28	2.57	3	24	4.71	5	6.9359	.0084
5	28	3.32	3	24	4.21	4	2.2894	.1303
6	28	1.29	1	24	2.79	3	2.5189	.1125
7	28	3.79	4	24	3.38	3.5	0.4432	.5056
8	28	2.61	2.5	24	2.96	3	0.0413	.839
9	28	4.21	4	24	4.71	4.5	0.9311	.3346
10	28	4.75	4.5	24	5.38	5	1.2618	.2613
11	28	3.39	3	24	3.25	3	0.0043	.9478
All skills	224	3.24	3	192	3.92	4	5.2114	.0224
12	28	3.43	3.5	24	4.17	4	0.7111	.3991
13	28	2.86	3	24	4.21	4	5.1478	.0233
14	28	3	3	24	3.38	3.5	0.282	.5954
15	28	3.04	3	24	3.54	3	0.3732	.5413
16	28	4.68	4.5	24	4.54	4.5	0.0014	.9704
All competence	140	3.4	3	120	3.97	4	3.6286	.0568

Kruskal-Wallis test.

learning outcome from the simulation to a small degree during hospital placement since the difference is constructed as described above (see Table 6). Moreover, when we compared student group 1 and student group 2, the median differences between the postsimulation and postplacement scores were equal in the two groups for knowledge and skills but significantly lower for group 2 for competence, with a p-value of .0335. Both groups had negative median differences, which indicates that their evaluations of their application of competence during placement were lower than their evaluations of their competence after simulation. However, the median difference was significantly lower in student group 2, which suggests that the application of competencies during placement was lower in group 1 (see Table 7).

5 | DISCUSSION

A prerequisite for transfer of learning to a new situation is to be exposed to new learning situations and reflect on experiences. In this study, the participants' self-reported knowledge, skills and competence in palliative care increased from pretest to postsimulation test. However, the median value decreased when students were asked if they had practised their knowledge, skills and competencies during hospital placement. The results indicate that the participants reported statistically significant learning outcomes from simulation but to a small degree practised the learning outcome during hospital

placement. In addition, when comparing the two student groups, the impact of simulation in general was larger in student group 2 than in student group 1. Furthermore, the degree of application of competencies during placement was lower in student group 1 than in student group 2.

According to the previously mentioned framework by Perkins and Salomon (2012), the question is not whether a statistically significant transfer of knowledge, skills and competence can occur but under what conditions learning occurs. To foster transfer of learning, the learner needs to detect a potential relationship with prior learning, elect to pursue this relationship, and identify a fruitful connection between previous learning and the current situation. We use the framework to discuss conditions for simulation and hospital placement that might have influenced the findings. Since the median differences between the postsimulation test and pretest scores in general were approximately between 3 and 5, the results indicate that the participants rated their knowledge, skills and competence low on the pretest.

This positive difference might indicate that palliative care was seen as difficult or, to use the terminology of Mezirow (2018), a problematic frame of reference before the simulation. The low scores in the pretest might indicate that the students found it hard to detect a relationship and build a mental bridge to prior learning. These results are in line with the findings from studies indicated nursing students' feelings of inadequacy in this field (Hall-Lord et al., 2017; Henoch et al., 2017; Zhou et al., 2021) that the results could also have been a

TABLE 6 Difference between schema 2 and schema 3 (post-test simulation and postplacement test)

Question	N	Mean	Median	W	p-value
Knowledge					
To what degree have you in this placement practised knowledge and :					
1. Observed and clinical assess signs that a patient is dying?	45	−3.64	−3	−372	<.0001
2. Informed a relative about clinical signs indicating that a patient is dying?	44	−5.66	−6	−409	<.0001
3. Informed a patient about clinical signs indicating that he/she is dying?	45	−5.24	−6	−383.5	<.0001
Skills					
To what degree have you in this placement practised skills and;					
4. Observe and clinically assess the patients' symptoms through ESAS-r schema?	45	−4.07	−4	−412.5	<.0001
5. Initiate symptom management to a patent in pain?	45	−4.29	−5	−420	<.0001
6. Initiate symptom management to a patient with nausea?	44	−2.50	−2	−254	<.0001
7. Initiate symptom management to a patient with respiratory problems?	45	−3.71	−4	−350	<.0001
8. Initiate symptom management to a restless patient?	45	−3.73	−4	−306	<.0001
9. Communicate about the patients' situation to a dying patient?	45	−3.62	−3	−342.5	<.0001
10. Communicate to the dying patient's relatives?	45	−4.13	−4	−317.5	<.0001
11. Safeguard the patient's autonomy and integrity	45	−2.07	−1	−225	.0003
Competence					
To what degree have you in this placement practised competence and:					
12. Show respect to a dying patient?	45	−2.42	−1	−235.5	<.0001
13. Show empathy to a dying patient?	45	−2.53	−2	−278	<.0001
14. Taken other people's situation and reactions seriously when talking to a dying patient and their relatives?	45	−2.27	−2	−263.5	<.0001

Wilcoxon's signed rank test.

result of self-reporting bias. Some students find it difficult to provide high ratings of their knowledge, skills and competence before a performance, especially in a field such as palliative care that they find unfamiliar and challenging. To facilitate students' recognition of and ability to detect former learning in palliative care during the simulation, the present study emphasized fidelity with the equipment by indicating signs and symptoms of the dying patient, such as reduced appetite and difficulty breathing. Silence in the room provided fidelity in the environment, and psychological factors were amplified through the inclusion of a grieving relative. The fidelity and the defined learning outcomes and safe learning environment was meant to help the participants with the second mental bridge in Salemon & Perkins's framework, that is, electing to pursue the detected connection between prior learning and the new situation. Connecting the relevant relationship between initial learning and learning in the simulation, the positive differences in the median values for knowledge, skills and competence might indicate that the participants faced disorienting dilemmas (Mezirow, 2003). Together with their peers in the simulation, the participants got an opportunity to identify a fruitful connection with their former knowledge, skills and competence and

develop new insight into palliative care principles through action and reflection. The low values for nausea and restlessness can be explained by a lack of focus on those symptoms in these cases. In the simulations, the participants in this study simulated the same case twice, with a reflective debriefing session after each simulation as recommended (Daley & Campbell, 2017). Being able to learn from the experience, discuss and try again may have influenced the students' motivation. The reported effect of the simulation on learning outcomes is in line with previous research (Lippe & Becker, 2015; Smith et al., 2018; Stroup, 2014; Svellingen et al., 2021; Venkatasalu et al., 2015).

Venkatasalu et al. (2015) reports that simulations of palliative care cases made it easier to recognize death and dying in placement for nursing students. The postplacement test in the present study measuring whether students had used their knowledge, skills and competencies in hospital placement yielded median difference scores from −0.5 to −6.5. The difference is constructed as the level of evaluation in the postplacement test minus the level of evaluation in the postsimulation test (Altman, 1991). This negative difference may indicate that the students did not have opportunities to

TABLE 7 Difference schema 2 and schema 3 (postsimulation and postpractice test) distributed on student groups

Difference	Group 1			Group 2			Kruskal-Wallis test	
Question	N	Mean	Median	N	Mean	Median	Chi-sq	p-value
1	23	−4.39	−5	22	−2.86	−2	2.598	.107
2	22	−6.05	−6	22	−5.27	−6.5	0.2258	.6347
3	23	−5.7	−6	22	−4.77	−6	0.1337	.7146
All knowledge	68	−5.37	−6	66	−4.3	−4.5	2.0074	.1565
4	23	−3.39	−4	22	−4.77	−5	1.4043	.236
5	23	−4.78	−5	22	−3.77	−5	0.7712	.3798
6	22	−2.59	−2	22	−2.41	−1.5	0.0022	.9624
7	23	−4.57	−5	22	−2.82	−4	2.4728	.1158
8	23	−4.17	−5	22	−3.27	−3.5	0.9435	.3314
9	23	−3.74	−5	22	−3.5	−3	0.1252	.7234
10	23	−4.48	−5	22	−3.77	−2.5	0.4246	.5146
11	23	−2	−2	22	−2.14	−1	0.1694	.6807
All skills	183	−3.72	−4	176	−3.31	−3	1.5506	.213
12	23	−3.04	−2	22	−1.77	−0.5	1.89	.1692
13	23	−3.09	−2	22	−1.95	−1	1.6438	.1998
14	23	−2.87	−2	22	−1.64	−0.5	1.0788	.299
All competence	69	−3	−2	66	−1.79	−1	4.5217	.0335

Kruskal-Wallis test.

take part in palliative care and continue building mental bridges, which is necessary to further develop their competence in the field (Perkins & Salomon, 2012). Several conditions can have affected the results. A driving force often described as necessary to determine whether transfer occurs is surface commonalities between the cases (Day & Goldstone, 2012; Perkins & Salomon, 1992). Smith et al. (2018) report that there are few opportunities for nursing students to learn palliative care in a clinical setting; consequently, in this study, conditions might not have been optimal for detecting palliative care needs and linking the situation to prior learning. There are no data in this study to validate such a possible explanation, but it must be taken into consideration that the medical and surgical placements were not specialized in palliative care. Another explanation could be limited invitations from the staff to the participants to take part in situations that involved patients with palliative care needs. Carmack and Kemery (2018) described that unit nurses were reluctant to involve students in palliative care, thus decreasing opportunities for exposure and learning. Even when there were patients with palliative care needs during the participants' hospital placements, the participants had to elect to participate and to pursue the detected connection with prior learning. For students in medical and surgical placements, there are many interesting subjects to learn, and many nursing students find technical skills most interesting (van Iersel et al., 2016). The seven-to-nine-week distance between the simulation and the postplacement test in this study may have affected the participants' attention to palliative care and explain the negative differences between the postplacement and postsimulation test scores. Additional simulation

"boosters" could have been one way to maintain the focus on the palliative care learning outcomes (Shariff et al., 2020).

The impact of simulation, in general, was larger in student group 2 than in student group 1 when the two student groups are compared. It is conceivable that student group 2 were given more opportunities in clinical placement since they had experience from one more placement than student group 1, and consequently more prerequisites for learning the complexity of palliative care. This can be an argument for emphasizing palliative care late in the education; however, the literature gives no consensus on this matter, and Carmack and Kemery (2018) recommend that palliative care activities must be integrated throughout nursing education.

Even though palliative care is set as a learning outcome for placement, students need self-motivation (Ryan et al., 2000) to seek out new challenges and transfer learning outcomes from simulation to placement. The participants' attitudes and motivation to elect to participate in palliative care situations in hospital placement was not questioned in this study. Students' self-motivation can be strengthened in the simulation by exploiting the potential that lies in encouraging students to become aware of ongoing learning (Shariff et al., 2020). Rivière et al. (2019) point out that the facilitator can improve the process during debriefing by letting the student group generalize their knowledge and be aware of further learning needs. Deliberate practice (Ericsson et al., 1993) can be used to set their personal goals according to what they need to continue working on in the field of palliative care.

However, an explanation for the negative difference between the postplacement test and the postsimulation test scores could also

be that the participants avoided pursuing the detected connection with prior learning due to their own feelings, the complexity of the situation or the patient and relatives' needs. A question both educational and ward staff should ask is whether it is ethically appropriate to expose patients with palliative care needs and their family members to students before students are well-trained.

Furthermore, the survey asked specific if the informants had used knowledge, skills and competence from the simulation on a palliative care situation in placement, indicating that we investigated near transfer. Transfer also includes far transfer to rather different contexts and performances (Perkins & Salomon, 1992). By asking more openly, we might have received answers indicating that the participants transferred the learnings outcomes to other situations in more acute or curative care, for example, about clinical reasoning or collaboration.

As argued, several conditions might have influenced the learning process of palliative care in simulation and hospital placement. Each mental bridge in the framework of Perkins and Salomon (2012) is individually necessary and mutually dependent in transfer of learning from one situation to another. The results from this study indicate that the conditions for connection between the mental bridges resulted in statistically significant learning outcomes in the simulations. However, interestingly, the students reported that they practised learning outcomes from simulating palliative care to a small extent in palliative care situations during hospital placement. This is an interesting finding since palliative care is a field that requires knowledge, skills and competence that nursing students find challenging to learn and perform (Hall-Lord et al., 2017; Henoch et al., 2017; Jeppesen et al., 2017), and education is described as an important element to increase access to palliative care for seriously sick and dying patients. The study results support the argument for the importance of allowing students to simulate different palliative care scenarios to ensure that they receive training in palliative care before they graduate. Moreover, educators and clinical staff need to help students build mental bridges to promote competence development in palliative care in the clinical environment through purposeful follow-up.

This study indicates that students' transfer and use of learning outcomes in placement is not a straightforward process. Few studies have examined the transfer of learning from simulation to clinical placement. Further studies should exceed the number of participants and cases. We recommend multicentre studies to investigate whether students use the learning outcomes in placement, particularly what inhibits and promotes students' ability to practice learning outcomes from simulation in clinical situations. Another perspective to elaborate is conducting virtual cases in order to create a thematic programme of learning situations and solutions in palliative care. Virtual cases could also be applied to other topics in clinical nursing.

6 | STRENGTHS AND LIMITATIONS

The strength of this study is the user participation and recommendations of third-year students and their supervisors that allowed us to prepare realistic cases and perform pilot testing of the cases and collect information on the content and formulation of the items in the questionnaire and the suggested rating scales. The participants and facilitators were familiar with simulations as a learning and teaching approach. The participants represented different hospital units and different genders and had no or few previous experiences with palliative care. One way that the motivation of the participants in the study could have been strengthened would have been to allow them to create a tailor-made, relevant simulation case with their clinical supervisors based on current patient situations. Furthermore, the aim of the study could have been more clearly communicated with the nurses in placement to increase the participants' access to palliative learning situations. The baseline and postsimulation measures were conducted the day the intervention occurred. Therefore, it is reasonable to assume that the intervention was the reason for increased knowledge, skills and competence. The ad hoc instrument developed for this study has not been psychometrically tested. However, the instrument was constructed based on white papers and international guidelines, and therefore, the contents are relevant for this particular study. The number of participants was low, and the hospital placements were not specialized in palliative care. The statistical analyses took into consideration the sample size. However, about the development of the scoring values for the measurements, both the median and mean values were presented to inform readers about the actual divergence. Misinterpretation might have generated bias in the use of the self-reported questionnaires, or the participants could have overestimated the effects of the training (Polit & Beck, 2017). Observation of their skills may have led to different results. Nevertheless, given the aim of this study, to examine nursing students' development of knowledge, skills and competence in palliative care through simulation and their opportunities to practice the learning outcomes during hospital placement, a self-reported method can provide valuable information.

7 | CONCLUSION

The results indicate that overall, palliative care simulation expanded participants' self-reported knowledge, skills and competence. However, the participants reported that they practised the learning outcomes of simulation to only a small degree during hospital placement. The study findings indicate that to fully exploit simulations, we need to focus on how students can detect and connect the coherence between a simulated setting and real-life situations and elect to pursue this coherence to foster further development of learning outcomes. Promoting simulation-based palliative care in clinical placement and in nursing education needs to be encouraged to increase access to palliative care and thereby improve quality of life for patients and their families.

CONFLICT OF INTEREST

There are no competing interests to declare.

AUTHOR CONTRIBUTIONS

KV and EKG designed the study. KV developed the simulation cases and questionnaires in collaboration with EKG, ALH and KTJ. KV was responsible for recruitment and performed the data collection. MS analysed the data. KV collaborated with MS and EKG to present the data. All authors contributed to the discussion of the results and writing the manuscript. All authors confirmed the last version of the manuscript.

ETHICAL APPROVAL

The Norwegian Centre for Research Data approved the study (project number 48268). All participants gave written consent for their participation and the publication of the findings.

DATA AVAILABILITY STATEMENT

Data are available on request to the first author.

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