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Clinical learning environment, role of the teacher, learning in a clinical practicum, and associated educational factors as perceived by healthcare students: a quantitative cross-sectional study

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Abstract

Aim: To explore the clinical learning environment (CLES), the role of the teacher (Tc2), and learning in a clinical practicum (LCP), and to explain the associated educational factors from healthcare students' perspectives. *Design:* A quantitative cross-sectional study. *Methods:* An online survey comprising CLES, Tc2 and LCP scales, each of which was measured using a 10-point Likert scale, was used to collect data from 1133 healthcare students at the end of their clinical practicum in a university hospital district in Finland. The data were analyzed statistically using one-way ANOVA, Spearman correlation coefficients, and linear models. *Results:* Students rated CLES (median 9.23) and LCP (median 9.13) the highest, and Tc2 (median 7.64) the lowest. Moderate positive correlations were found between CLES and Tc2 ($r_s = 0.438$, $p < 0.0001$), as well as between CLES and LCP ($r_s = 0.625$, $p < 0.0001$). The strongest positive correlation was found between the premises of learning and LCP. Additionally, significant positive associations were found between several educational factors and CLES, Tc2, and LCP. *Conclusion:* The role of the teacher should be further explored to meet the expectations of healthcare students and better support their clinical learning. More objective measurements are needed to focus on the students' achievement of intended learning outcomes that facilitate their transition from students to professionals.

Keywords: clinical learning, clinical learning environment, healthcare students, supervision, teachers.

Introduction

A clinical practicum refers to the clinical training of students conducted in clinical learning environments (European Parliament and Council, 2013). A concept analysis by Flott and Linden (2016) identified four attribute characteristics of clinical learning environments that influence the achievement of learning outcomes: the physical space, organizational culture, psychosocial and interaction factors, and teaching and learning components. When considering the physical space, the clinical learning environment includes clinical settings such as hospitals, primary healthcare facilities, (Flott & Linden, 2016), psychiatric care facilities, and nursing homes, as well as and the homes of healthcare clients and patients (Bisholt et al., 2014). Additionally, simulation centers (Flott & Linden, 2016) play a crucial role by offering physical environments where healthcare students can develop the knowledge, skills, attitudes, and values necessary to become registered nurses (Bisholt et al., 2014; Levett-Jones et al., 2015). Organizational culture (i.e., social atmosphere of the clinical placement) includes managers', healthcare staff's, patients', and clients' perceptions, attitudes, and behavior toward healthcare education (Arkan et al., 2018; Flott & Linden, 2016; Inocian et al., 2022; Singer et al., 2022). The psychosocial and interaction factors related to the clinical learning environment include collaboration among practicum

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placements, educational institutions, and students, as well as diverse relationships with students' mentors, other health professionals, peers, teachers and patients / clients (Arkan et al., 2018; Inocian et al., 2022; Singer et al., 2022). The teaching and learning components of clinical learning environments include supervisory relationships between students and mentors, learning opportunities in patient care, and students' engagement to self-directed learning (Flott & Linden, 2016).

The global reforms and development of healthcare education have led to changes and new types of role expectations of teachers. These appear as new challenges to teacher's clinical roles in supervising students. Nowadays, the clinical role of a teacher rarely includes teaching clinical skills. Furthermore, alongside traditional pedagogical expertise, supporting students in their individual learning process (Killam & Heerschap, 2013) with flexible cooperation methods is seen as crucial to the clinical role of teachers. Globally, however, the actual implementation of the clinical role varies greatly (Saarikoski et al., 2013). For example, the clinical role has variously been described internationally using the following concepts: link teacher, link tutor, instructor, facilitator, clinical lecturer, clinical educator and nurse educator. In this study, teacher refers to an educationally certified healthcare teacher employed by an educational institution, who is primarily responsible for the learning of healthcare students during a clinical practicum (European Parliament and Council, 2005).

One objective of a clinical practicum is for students to learn metacognitive skills. For example, they should take responsibility for their individual learning process (Hwang et al., 2012) and reflect on their actions comprehensively (Zhu et al., 2022). In addition, students are expected to learn to make clinical decisions, take care of patients holistically (Lee et al., 2019), and collaborate as part of an interprofessional team (Lee et al., 2019; Zhu et al., 2022) and with their student colleagues (Jacobsen et al., 2022; Zhu et al., 2022). However, learning in a clinical practicum can be challenging for students for various reasons, such as issues related to the learning environment and supervision. Reciprocal student-patient relationships and a sense of inclusion in clinical placements are critical to students' learning (Manninen, 2016). It is also known that students' views of the clinical environment are crucial to achieving the desired learning outcomes (Phillips et al., 2017).

Factors associated with the quality of clinical learning environments and students' learning during the clinical practicum must be recognized so that these environments can be developed to be more attractive and effective. This is crucial in light of the predicted global shortage of 18 million healthcare professionals by 2030 (World Health Organization, 2022) and the high turnover among young nurses (Flinkman, 2014; Rush et al., 2019). Only a few previous studies have investigated factors associated with the quality of the clinical learning environment. The quality of the learning environment was rated higher the more often students met their mentors (Al-Anazi et al., 2019) or teachers (Papastavrou et al., 2016). Graduation (Norfadzilah & Nurul, 2018) and success of the mentoring relationship (Papastavrou et al., 2016) were also associated with a more positive evaluation of the quality of the learning environment. These factors are essential because it is known that students' learning experiences and satisfaction with clinical learning environments relate to their future commitment to work in practicum placement settings / units (Anyango et al., 2024; Kaihlanen et al., 2021; Rodríguez-García et al., 2021). However, previous studies have only applied descriptive methods to investigate educational factors related to the quality of clinical learning environments and students' learning. Previous research has indicated the need to examine the associations between student learning outcomes, positive student experiences of teachers' clinical roles, and the clinical learning environment and supervision (Strandell-Laine et al., 2022). Therefore, this study aimed to explore the clinical learning environment, the role of the teacher, and learning in a clinical practicum, and to explain the associated educational factors from healthcare students' perspectives.

Aim

The aim of this study was threefold: (1) to explore how healthcare students assess the clinical learning environment (CLES), the role of the teacher (Tc2), and learning in a clinical practicum (LCP); (2) to explore the associations between CLES, Tc2, and LCP; and (3) to explain educational factors associated with CLES, Tc2, and LCP, if any.

Methods

Design

A quantitative cross-sectional study design was used.

Sample

In this study, the context of the clinical learning environment refers to inpatient units and outpatient hospital clinics in 24 hospitals in a Finnish university

hospital district. This is where clinical training (European Parliament and Council, 2005; 2013) of healthcare students takes place during their clinical practicum. Cross-sectional survey data were collected between January and June 2020 from 1133 healthcare students during the final week of their clinical practicum period. The inclusion criteria for students were completing a clinical practicum in the hospital district, being a full-time bachelor's level student, and participating voluntarily. The exclusion criteria were being a medical or master's level student or declining to participate. Data were collected using a self-administered electronic questionnaire. The recruitment of students to complete the survey was organized by their mentors. A link to the electronic questionnaire with an invitation letter was shared on the university hospital's website.

Data collection

The electronic questionnaire consisted of three scales: (1) Clinical Learning Environment and Supervision, a modified version of the Clinical Learning Environment, Supervision and Nurse Teacher Scale (Saarikoski et al., 2008) used for national benchmarking purposes in Finland (Meretoja et al., 2018); (2) Role of the Teacher (Strandell-Laine et al., 2023); and (3) Learning in a Clinical Practicum (Strandell-Laine et al., 2023). The questionnaire also included age as a sociodemographic factor, as well as educational factors such as degree program, length of the practicum period, supervision model, theoretical education before the clinical practicum, mid-term feedback session, supervision-supported professional development, achieving clinical learning goals, summative evaluation of the practicum period, and recommendation of the clinical practicum placement to peer students, in other words, the Net Promoter Score (NPS) (Dawes, 2023) (Table 1).

The modified version of the CLES scale, developed to evaluate the quality of the clinical learning environment, included four dimensions: atmosphere (7 items), premises of care (4 items), premises of learning (7 items), and supervisory relationship (8 items) (Saarikoski et al., 2008). The Role of the Teacher (Tc2) scale by Strandell-Laine et al. (2023), developed to evaluate the clinical role of the nurse teacher, included two subscales: cooperation triad (6 items) and teacher's pedagogical cooperation with students (5 items). The Learning in Clinical Practicum (LCP) scale, developed to measure students' self-assessed learning outcomes after completing the clinical practicum period, included one dimension with eight items measuring different aspects of intended learning outcomes

in the clinical practicum, namely: learning metacognitive skills (2 items), learning about patient / client care (3 items), learning to collaborate (2 items), and gaining professional competence to enter the healthcare profession (1 item). All scales used a 10-point Likert scale (1 = totally disagree; 10 = totally agree; plus the option "does not apply to me") was used. Validity and reliability have been reported for the CLES scale by several authors (Cant et al., 2021) and for the Tc2 and LCP scales by Strandell-Laine et al. (2023).

Data analysis

The data are part of a larger research project. In the first phase, the data were used to investigate the psychometric properties of the Tc2 and LCP scales. The results were published by Strandell-Laine et al. (2023). In the second phase, the same data were used to explore the clinical learning environment, the role of the teacher, and learning in a clinical practicum, and to explain the associated educational factors from healthcare students' perspectives.

In the analysis, the median scores of sum variables were segmented into five groups to illustrate the level of students' perceptions: very weak (< 2.1), weak (2.1–4.0), satisfactory (4.1–6.0), good (6.1–8.0), and very good (> 8.0) (Suikkala et al., 2021). The associations between dependent variables (CLES, Tc2, and LCP scales) and relevant educational factors: degree program, duration of the clinical practicum, occurrence of supervision, discussion about learning goals with a named mentor, mid-term feedback session, achieving clinical learning goals (as 4 and 5 options combined), summative evaluation of the practicum period, theoretical education before the clinical practicum, and recommendation of the clinical practicum placement to peer students categorized as promoters (9 or 10), passives (7 or 8), or detractors (0–6) were first studied using a one-way analysis of variance (ANOVA). From these analyses, significant explanatory variables were incorporated into the initial multivariable model (linear model). Then, the multivariable model was simplified step by step by removing non-significant terms from the statistical model. The final models included five educational factors: theoretical education before the clinical practicum, mid-term feedback session, achieving clinical learning goals, summative evaluation of the practicum period, and recommendation of the clinical practicum placement to peer students. Since the observed distributions of all the scores showed a clear deviation from normal distribution

(most having rather high values), a special transformation was required to satisfy the assumptions of the linear models. First, a "mirror" distribution was created by subtracting (11 – score) to obtain only a right-skewed distribution. Then, a logarithmic transformation was performed to achieve normally distributed data.

In addition, we calculated a Spearman correlation between the scores (Schober et al., 2018). A significance level of 0.05 (two-tailed) was used for all analyses. The data analysis for this study was performed using Release 9.4 of the SAS System for Windows (SAS Institute Inc., Cary, NC, USA).

Table 1 Sociodemographic and educational background factors of the students (N = 1133)

Variable	N (%)
Age	
< 20	17 (1.5)
20–24	446 (39.4)
25–29	344 (30.4)
≥ 30	326 (28.8)
Degree program	
nursing degree program (nursing, public health nursing, midwifery, paramedics)	768 (70.1)
other degree programs (radiographer, biomedical laboratory science, practical nurse, physiotherapy, social sciences)	328 (29.9)
Length of practicum period	
≤ 3 weeks	172 (15.2)
4–5 weeks	530 (46.8)
≥ 6 weeks	431 (38.0)
Supervision model	
a named personal supervisor	810 (71.5)
different supervisors depending on the shift or place of work	244 (21.5)
group supervision	51 (4.5)
other	28 (2.5)
Mid-term feedback session	
yes	848 (74.9)
no	284 (25.1)
Achieving clinical learning goals	
very well	661 (58.3)
fairly well	419 (37.0)
moderately	40 (3.5)
poorly	13 (1.2)
Supervision supported professional development	
very well	788 (69.7)
fairly well	270 (23.9)
moderately	52 (4.6)
quite poorly	15 (1.3)
very poorly	5 (0.4)
Summative evaluation of the practicum period	
yes	1053 (93.3)
no	76 (6.7)
Theoretical education before the clinical practicum	
very good	261 (23.1)
fairly good	509 (45.0)
moderate	276 (24.4)
quite poor	76 (6.7)
very poor	10 (0.9)
Recommendation of the clinical practicum placement to peer students[a]	
promoters	874 (80.9)
passives	143 (13.2)
detractors	63 (5.8)

[a]*Net Promoter Score® (NPS) of 9–10 (promoters), 7–8 (passives) and 0–6 (detractors).*

Results

Student and educational characteristics

A total of 1133 healthcare students participated in the study, the majority of whom were under 30 years old (71.2%) and enrolled in a nursing degree program (70.0%). The clinical practicum period typically lasted 4–5 weeks (46.8%), and 71.5% of students were supervised by a named personal mentor. In most cases, a mid-term feedback session was held (74.9%), and the majority had a summative evaluation of the clinical practicum period (93.3%). Over half of the respondents reported achieving clinical learning goals very well (58.3%) and stated that supervision supported their professional development very well (69.7%). Almost half of the participants reported that theoretical education before the clinical practicum had supported their clinical learning fairly good (45.0%). Most of the respondents were classified as promoters (80.9%) in terms of recommending the clinical practicum placement to peer students. Thus, the NPS was 75 (Table 1).

Students' assessments of CLES, Tc2, and LCP

The students gave the highest ratings to LCP, with a median of 9.13 (Q1 8.50, Q3 9.75). However, CLES was also assessed at a very good level, with a median of 9.23 (Q1 8.50, Q3 9.69). They assessed Tc2 as the lowest, still at a good level, with a median of 7.64 (Q1 6.00, Q3 8.91). In terms of Tc2 subscales, the cooperation triad was assessed the lowest with a median of 7.33 (Q1 5.50, Q3 8.67) (Table 2).

Table 2 Students' evaluations of CLES, Tc2, and LCP (N = 1093–1132)

Sum variables	N^a	Median	Q_1	Q_3
CLES	1132	9.23	8.50	9.69
atmosphere	1013	9.00	8.29	9.71
premises of care	1055	8.75	8.25	9.50
premises of learning	1080	9.29	8.43	9.86
supervisory relationship	1109	9.75	8.88	10.00
Tc2	1093	7.64	6.00	8.91
cooperation triad	1073	7.33	5.50	8.67
teachers' pedagogical cooperation with students	1048	8.20	6.40	9.40
LCP	1130	9.13	8.50	9.75

[a]The Likert scales had a response option "does not apply to me" which was coded as a missing value during the data analysis. However, the numbers of respondents (N) at the subscale level are based on those who responded to at least one item of the subscale. CLES – clinical learning environment; Tc2 – role of the teacher; LCP – learning in a clinical practicum

Associations between CLES, Tc2, and LCP

Statistically significant positive correlations were found between CLES and Tc2, CLES and LCP, and Tc2 and LCP. Spearman's r-values indicated moderate positive correlations between CLES and Tc2, as well as between CLES and LCP. The higher students rated CLES, the higher they rated Tc2 ($r_s = 0.438$, $p < 0.0001$). Similarly, the higher students rated CLES, the higher they rated LCP ($r_s = 0.625$, $p < 0.0001$). A weak positive correlation was found between Tc2 and LCP ($r_s = 0.360$, $p < 0.0001$).

At the subscale level, the highest positive correlation was found between the atmosphere and cooperation triad ($r_s = 0.392$, $p < 0.0001$), indicating a moderate correlation. Moreover, Spearman's r-value indicated a significant moderate positive correlation between the premises of learning and LCP ($r_s = 0.610$, $p < 0.0001$). Finally, Spearman's r-value indicated a weak positive correlation between the cooperation triad and LCP ($r_s = 0.344$, $p < 0.0001$). Detailed information about the correlations is presented in Table 3.

Educational factors associated with CLES, Tc2, and LCP

The final model revealed significant positive associations between two educational factors (mid-term feedback session and likelihood of recommending the clinical practicum placement to peer students) and CLES, Tc2 (including both subscales), and LCP. Additionally, significant positive associations were found between two educational factors (achieving clinical learning goals and summative evaluation of the practicum period) and CLES and LCP. Also, a significant positive association was found between theoretical education before the clinical practicum and CLES, as well as Tc2. However, a significant association between theoretical education before the clinical practicum and LCP was not linear in the final model. Detailed information regarding model-based mean estimates, 95% CI, and p-values is presented in Table 4.

Table 3 Spearman's correlation coefficients of CLES, Tc2, and LCP (N = 1093–1132)[a]

Sum variables of CLES, Tc2, and LCP	CLES	Atmosphere	Premises of care	Premises of learning	Supervisory relationship	Tc2	Cooperation triad	Teachers' pedagogical cooperation with students	LCP
CLES[a]						0.438	0.434	0.386	0.625
atmosphere			0.632	0.745	0.667	0.394	0.392	0.334	0.568
premises of care		0.632		0.627	0.547	0.372	0.344	0.329	0.508
premises of learning		0.745	0.627		0.744	0.381	0.370	0.331	0.610
supervisory relationship		0.667	0.547	0.744		0.325	0.322	0.272	0.594
Tc2[a]	0.438	0.394	0.372	0.381	0.325		0.943	0.869	0.360
cooperation triad	0.434	0.392	0.344	0.370	0.322	0.943		0.683	0.344
teachers' pedagogical cooperation with students	0.386	0.334	0.329	0.331	0.272	0.869	0.683		0.343
LCP[a]	0.625	0.568	0.508	0.610	0.594	0.360	0.344	0.343	

[a]*All Spearman's correlation coefficients are significant at a level of $p < 0.0001$. Interpretation of the Spearman's correlation coefficients: ≤ 0.30 weak, 0.4–0.6 moderate, ≥ 0.70 strong (a significance level of $p < 0.0001$). CLES – clinical learning environment; Tc2 – role of the teacher; LCP – learning in a clinical practicum*

Table 4 Educational background factors related to CLES, Tc2, and LCP

Educational background factors	CLES			Tc2			LCP		
	Model–based mean estimate	95% CI[a]	p-value[b]	Model–based mean estimate	95% CI[a]	p-value[b]	Model-based mean estimate	95% CI[a]	p-value[b]
Mid-term feedback session			0.014			0.003			0.016
yes	7.45	7.29–7.61		7.18	6.65–7.64		8.35	8.10–8.57	
no	7.31	7.14–7.48		6.71	6.09–7.24		8.16	7.89–8.41	
Achieving clinical learning goals			< 0.0001			0.202			< 0.0001
very well	8.00	7.86–8.15		6.91	6.39–7.36		9.07	8.90–9.22	
fairly well	7.61	7.47–7.75		6.65	6.13–7.12		8.47	8.27–8.66	
moderately	7.09	6.84–7.35		6.54	5.60–7.33		8.10	7.68–8.47	
quite poorly or very poorly	6.81	6.36–7.27		7.61	6.18–8.61		7.00	5.96–7.82	
Summative evaluation of the practicum period			0.006			0.077			0.016
yes	7.43	7.27–7.59		6.70	6.15–7.19		8.41	8.19–8.61	
no	7.17	6.95–7.39		7.19	6.52–7.75		8.09	7.75–8.40	
Theoretical education before the clinical practicum			0.028			< 0.0001			< 0.0001
very good	7.57	7.40–7.73		8.72	8.40–9.00		8.52	8.28–8.73	
fairly good	7.40	7.26–7.55		7.85	7.46–8.20		8.21	7.97–8.43	
moderately	7.39	7.24–7.55		6.98	6.44–7.46		7.94	7.67–8.19	
quite poor	7.45	7.25–7.66		6.60	5.83–7.25		8.08	7.74–8.39	
very poor	7.08	6.60–7.57		2.42	–1.47–5.10		8.48	7.79–9.03	
Recommendation of the clinical practicum placement to peer students (NPS)[c]			< 0.0001			0.030			< 0.0001
promoters	8.67	8.50–8.83		7.55	7.05–7.98		8.71	8.49–9.91	
passives	7.76	7.57–7.95		7.04	6.40–7.58		8.27	7.97–8.53	
detractors	5.71	5.49–5.93		6.14	5.26–6.89		7.69	7.29–8.06	

[a]*CI confidence interval;* [b]*The significance level for p-values was set at 0.05;* [c]*Net Promoter Scores® (NPS) of 9–10 (promoters), 7–8 (passives), and 0–6 (detractors).*

CLES – clinical learning environment; Tc2 – role of the teacher; LCP – learning in a clinical practicum

Discussion

This study aimed to explore the clinical learning environment, the role of the teacher, and learning in a clinical practicum, and to explain the associated educational factors from the healthcare students' perspectives. Special interest was given to explaining the associated educational factors due to the scarcity of previous research. The students rated LCP as the highest, CLES as the second highest, and Tc2 as the lowest, though still at a good level. The COVID-19 pandemic radically changed how supervision meetings were organized between students, mentors, and teachers, while clinical training itself was traditionally conducted in practicum placements. Due to visiting restrictions at the study hospitals, face-to-face cooperation meetings between teachers, students, and mentors in clinical settings were replaced by online meetings. This change may have affected students' evaluations regarding teachers' clinical roles, which is possibly reflected in this study by only finding a weak correlation between Tc2 and LCP. However, this study revealed the importance of the cooperation triad; a moderate correlation was found between the atmosphere and the cooperation triad, meaning that the better students rated the cooperation between themselves, their mentors, and their teachers, the better they rated the atmosphere. It is also known that teachers' roles in a clinical practicum have changed over the years due to a lack of resources in educational organizations (Saarikoski et al., 2008), and student nurses' individual learning plans and learning paths have been emphasized (Council of the European Union, 2018). All these changes and demands require teachers to have appropriate pedagogical and clinical competence, which have been found to be linked to students' learning outcomes (Salminen et al., 2021). Thus, both the competence and the optimal clinical role of teachers must be safeguarded, as cooperation between the student and teacher is essential to enhancing the student's learning (Strandell-Laine et al., 2018). Therefore, it is crucial to develop alternatives that facilitate the optimal clinical role of teachers and help students achieve the expected clinical learning outcomes (Strandell-Laine et al., 2018; 2019).

It is noteworthy that, in general, students' self-evaluations of their learning outcomes were relatively high, according to this study. This result was somewhat expected because previous research showed that students evaluated their competence as good (Kajander-Unkuri et al., 2021). However, this result may indicate that students tend to assess their learning outcomes more positively than they actually are. For instance, a study by Kajander-Unkuri et al. (2016) found that students overestimated their nursing competence compared to nurse mentors' assessments. In the future, attention must be paid to how the learning outcomes of a clinical practicum are assessed. These assessments should also be based on objective assessment methods, not just on students' self-assessments.

The present study demonstrated a strong correlation between CLES and LCP, meaning that the higher students rated CLES, the higher their self-reported learning outcomes were during the clinical practicum. The clinical practicum period is expected to contribute toward students' learning and professional growth (Cooper et al., 2015; Järvinen et al., 2018) by providing opportunities to integrate previously acquired theoretical knowledge into practice (Flott & Linden, 2016; Forber et al., 2016). Moreover, the clinical practicum is aimed toward further development and learning of new clinical skills (Forber et al., 2016; Lee et al., 2018; Pitkänen et al., 2018) as well as development of students' professional attitudes and identity (Forber et al., 2016) through direct contact with healthcare service users (European Parliament and Council, 2013). Therefore, the results of this study emphasize the importance of paying attention to the quality of clinical learning environments. Providing high-quality clinical environments for students can enhance their learning and consequently impact the quality of health services in the future.

Our study also found theoretical education before the clinical practicum to be associated with CLES, Tc2, and LCP. Thus, it is important to note that the teacher must maintain a high level of competence to ensure high-quality teaching (Salminen et al., 2021). This may require more intensive collaboration between educational institutions and clinical practice, as well as novel alternatives for conducting theoretical training that meet the ever-changing competence requirements of healthcare professionals. Previous studies have shown that students are especially critical concerning teacher competence in integrating theory and everyday clinical practice (Salifu et al., 2019; Salminen et al., 2021). Interestingly, in the present study, the association between theoretical education before the clinical practicum and LCP was not linear. Students who had no opinion on theoretical education before the clinical practicum learned the least during their training. In other words, the better or lower students evaluated theoretical

education before the clinical practicum, the higher they evaluated their learning outcomes, albeit from different starting points. Therefore, engaged mentors who can recognize each student's individual level and thus help them connect knowledge and previous experiences to clinical practice are pivotal to learning outcomes (Falk et al., 2016; Thunes & Sekse, 2015). Theoretical training prior to clinical practice, which does not always match the complexity of the clinical learning context, poses challenges for mentors. In situations where students lack theoretical knowledge, mentors should provide detailed explanations beforehand and discuss student's performance afterwards (Ewertsson et al., 2017). Moreover, communication and soft skills training before the clinical practicum prepares students to meet the complexity of the intrinsic challenges of the clinical learning environment (Arkan et al., 2018; Singer et al., 2022).

A mid-term feedback session, summative evaluation of the practicum period, and achievement of clinical learning goals were found to explain students' assessments of CLES, Tc2, and LCP. As in a previous study, students who had a mid-term feedback session were more satisfied with the role of the teacher (Suikkala et al., 2021). The mid-term feedback session and summative evaluation of the practicum period play an important role in students' clinical learning; students can receive constructive and encouraging feedback aimed at improving their performance at the end of their clinical practicum and for the next one (Saukkoriipi et al., 2020). However, the focus should be more on ongoing feedback and students' progression in relation to achieving their learning outcomes and professional competence (Jokelainen et al., 2013; Vae et al., 2018.) To enhance students' learning outcomes, it is recommended that pedagogical strategies be used to promote active student participation in feedback discussions focused on their learning goals (Ossenberg et al., 2023). Besides mentors, teachers' participation in mid-term feedback and summative evaluation sessions, as well as their continuous support, are important factors in helping students achieve their clinical learning outcomes (Pitkänen et al., 2018; Suikkala et al., 2021).

In this study, the likelihood of recommending the clinical practicum placement to peer students was revealed to explain students' better evaluations from CLES, Tc2, and LCP. The likelihood of recommending the clinical practicum placement was assessed with a Net Promoter Score. Although NPS is widely used, some have criticized that many

of its proposed advantages lack support from research (Adams et al., 2022). Furthermore, Stanbery et al. (2023) stated that NPS's ability to capture the impact of changes should be further explored. In the present study, NPS was found to be one of explanatory factors in terms of CLES, which is in line with previous studies. For instance, a study by Rodríguez-García et al. (2021) identified an association between students' overall satisfaction and CLES. The higher students evaluated CLES, the greater their satisfaction and willingness to consider their placement hospital as a future workplace (Rodríguez-García et al., 2021). This highlights the importance of using continuous feedback systems in clinical learning environments. According to Stanbery et al. (2023), using NPS for real-time monitoring could be considered. Thus, student satisfaction could be evaluated during the clinical practicum period, and if needed, improvements could be made to ensure overall students' satisfaction and sense of belonging in the clinical learning environment. This is of the utmost importance given the global deficit of nurses; all efforts must be made to engage students in the profession and their clinical placements.

Limitation of study

The participants in this cross-sectional study comprised healthcare students completing their clinical practicum in 24 hospitals within one of five university hospital districts in Finland. Thus, the clinical practicum placements were highly specified. Moreover, the placements were diverse, including inpatient wards and outpatient clinics, where learning and supervision activities could vary. Thus, future studies should explore the impact of the clinical setting on learning and supervision.

The convenience sample did not represent all healthcare students completing their clinical practicum during the data collection time, and not all students participated in the survey due to its voluntary nature. While student nurses were overrepresented in the sample, their ratio to all healthcare students represents the Finnish healthcare student population. Furthermore, students might have given socially desirable responses, so the findings might be somewhat specific in relation to the sample. However, given the large sample size (n = 1133), the findings could prudently be generalized to other university hospital contexts.

The widely used and psychometrically tested CLES scale has been used among healthcare students in previous studies (Adam et al., 2021; Saukkoriipi et al., 2020; Strandell-Laine et al., 2018; Suikkala

et al., 2021; Ziba et al., 2021). In this study, the Tc2 scale (Strandell-Laine et al. 2023) and the LCP scale (Strandell-Laine et al., 2023) were used for the first time. The Tc2 scale, measuring the teacher's role, and the LCP scale, measuring learning in the clinical practicum, have both proven to be valid and reliable in Finnish university hospital settings (Strandell-Laine et al., 2023). The lengthy electronic questionnaire consisting of three scales could be seen as a limitation which must be considered (Baxter & Norman, 2011).

Of note, this study took an explanatory approach to identify relevant educational factors to consider when helping students achieve their clinical learning outcomes. However, there are more educational factors that deserve exploration, such as educational games (Brown et al., 2019; Hara et al., 2021; Koivisto et al., 2018), simulation-based education (Cant & Cooper, 2017; Shin et al., 2015), as well as virtual and augmented reality (Mendez et al., 2020). These factors aim to improve healthcare students' preparation for clinical training.

Conclusion

The present study pointed out that healthcare students were satisfied with the quality of the clinical learning environment. They achieved desirable learning outcomes in those environments. However, the study highlighted the need for further developing the role of teachers, since students were not that satisfied with their support. The teachers' role in a clinical practicum should be redesigned in terms of how teachers could better support students' learning and collaborate more effectively with students and their mentors. It would also be beneficial to investigate the type of support that healthcare students need from their teachers. Moreover, the role of teachers should be further explored when introducing new supervision interventions, such as dedicated educational units or interprofessional training wards, in a clinical practicum. In other words, more robust comparative studies are needed regarding the role of teachers in different supervision models during the clinical practicum.

This study demonstrated an association between the quality of the clinical learning environment and students' learning outcomes. It is crucial to ensure that students receive continuous quality feedback during the clinical practicum period and that a mid-term feedback session is held. It is also important to facilitate opportunities for students to give feedback as well, for example, via the Net Promoter Score. Furthermore,

it is of the utmost importance to ensure that mentors and teachers support students in achieving their learning goals and that a summative evaluation is held at the end of the practicum, in which students' learning outcomes are reflected in a cooperation triad. However, more objective and valid measurements are needed when evaluating students' intended learning outcomes of a clinical practicum. Taking these quality factors into consideration may enhance students' clinical learning and, in turn, promote their satisfaction with clinical learning environments. In summary, focusing on the quality of clinical learning environments is essential to ensuring there will be a sufficient competent workforce in the future and a seamless transition from students to professionals.

Ethical aspects and conflict of interest

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Author contributions

Conception and design (CSL, AS, TH), data collection (LT), data analysis and interpretation (CSL, AS, TH, EL), manuscript draft (CSL, AS, TH), critical revision of the manuscript (CSL, AS, TH, EL, LT), final approval of the manuscript (CSL, AS, TH, EL, LT).

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