













RESEARCH ARTICLE

Clinical learning environment and graduating nursing students' competence: A multi-country cross-sectional study

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Abstract

The purpose of this study was to explore nursing students' perceptions of their final clinical learning environment and its association with their self-assessed competence, satisfaction with nursing education, and turnover intentions at graduation in six European countries. A multi-country comparative cross-sectional study was conducted with nursing students ($n = 1746$) from the Czech Republic, Finland, Italy, Portugal, Slovakia, and Spain using the Nurse Competence Scale and the Clinical Learning Environment and Supervision scale. Nursing students' overall perceptions of their final clinical learning environment and supervision were positive in all the countries studied. The correlation between the students' perceptions of their final clinical

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learning environment and competence was statistically significant and positive. Satisfaction with the nursing program and clinical practicum and no consideration of career change were related to positive perceptions of the final clinical learning environment. Highlighting the importance of the supervisory relationship and pedagogical atmosphere, nursing students' positive perceptions of the final clinical learning environment and supervision contribute to a better level of self-assessed competence and satisfaction with the nursing program and clinical practicum, leading to lower turnover intentions.

KEYWORDS

clinical learning environment, clinical practicum, competence, nursing education, nursing students, turnover intentions

1 | INTRODUCTION

In nursing education, clinical learning is of high importance for the competence development of nursing students (European Commission [EC], 2013; van Rooyen, Jordan, ten Ham-Baloyi, & Caka, 2018); in particular, the final clinical practicum plays a significant role in the transition from student to registered nurse (Kaihlainen, Elovainio, Haavisto, Salminen, & Sinervo, 2020). According to the updated EU directive 2013/55/EU, nursing education comprises at least 2300 hours of clinical learning in different clinical learning environments (EC, 2013).

Upon graduation, nursing students are expected to have sufficient high-level competence to provide effective and high-quality nursing care, ensuring the safety of patients in the rapidly changing health care environment (EC, 2013, 2020). The acquisition of competences is completed when the knowledge, skills, attitudes, and values acquired during the theoretical studies are transferred into practice in different health care contexts (Flinkman et al., 2017; Meretoja, Isoaho, & Leino-Kilpi, 2004). Clinical learning is considered an ideal setting for students to integrate and apply these competences into clinical nursing performance (Arrogante, 2017; Fan, Wang, Chao, Jane, & Hsu, 2015); however, little is known about the association of competence development and the final clinical practicum.

The final clinical practicum experience before graduation is associated with the transition experience and turnover intentions of graduated nurses (Kaihlainen et al., 2020). The turnover of new nurses is a serious problem for health care organizations in Europe. In Nurse Forecasting in Europe (RN4CAST) studies, altogether 9.5% of practicing nurses in 10 European countries reported an intention to leave the profession, the proportion ranging from 5.4 to 18.3% in the participating countries (Heinen et al., 2013; Leineweber et al., 2016). In a recent European study, as many as 25.6% of graduating nursing students had thought of leaving the nursing profession even before they had graduated (Kajander-Unkuri et al., 2020). All in all, turnover has negative consequences for patients and health care organizations, as the cost per nurse of turnover can range from \$10 098 to \$88 000 (Halter et al., 2017), in addition to leading to an increasing shortage of nurses (EC, 2020; World Health Organization, 2020). The

COVID-19 pandemic also poses risks and has impact on nurses, especially older ones (Buerhaus, Auerbach, & Staiger, 2020). They might leave the workforce earlier than planned, which exacerbates the nursing shortage. The final clinical practicum, which usually takes place in the final semester of nursing education, prepares students for the transition and future working life, and when successful, promotes a positive transition (Kaihlainen et al., 2020).

This study aimed to explore the perceptions of graduating nursing students regarding their final clinical learning environment and its association with their competence, satisfaction with nursing education, and turnover intentions at the point of graduation in six European countries. The results of this study are useful for identifying the impact that different learning environment elements have on competence achievement, satisfaction with nursing education, and turnover intentions from the nursing students' perspective.

2 | BACKGROUND

Clinical learning is a vital part of nursing education that challenges nursing students' critical thinking, decision-making, independence, responsibility, and use of evidence-based knowledge (EC, 2013; Pitkänen et al., 2018). A successful clinical practicum is also important for students' professional development (Saukkoriipi et al., 2020). Good quality for the clinical learning environment has been found to consist of the pedagogical atmosphere on the ward, supervisory relationship, leadership style of the ward manager, and the premises of nursing on the ward (Saarikoski, Isoaho, Warne, & Leino-Kilpi, 2008; Saukkoriipi et al., 2020). The final clinical practicum before graduation is the last chance for nursing students to get prepared for the upcoming transition (Kaihlainen et al., 2020; Wu, Enskär, Lee, & Wang, 2015). The transition process from student to registered nurse can be exciting, but it can also be challenging and stressful. Students might feel insecure about their own competence at the moment of graduation and worry about increased responsibility, ensuring patient safety, and integrating learned theory with actual practice according to their expectations (Labrague & McEnroe-Petitte, 2018). As students are worried

TABLE 1 Nursing education, variability depending on the country

Country	Length of the education (years)	ECTS	Length of clinical practicums (hours)	ECTS	Length of the final clinical practicum (weeks)	Clinical learning context in final year practicum
Czech Republic ^d	3	180	2300	80–90	2–14 ^b	Outpatient and inpatient care, home care, community care, long term care, intensive care, palliative care, psychiatry, small medicine disciplines (Oto-rhino-laryngology, dentistry, ophthalmology, dermatology)
Finland ^{e,f}	3.5	210	2300	90	3–12 ^b	Critical care nursing (ICU, ER), operative nursing (OR, surgical ward), pediatric and family nursing, internal medicine nursing, mental health nursing and substance abuse services, elderly care, primary health care, reception work
Italy ^g	3	180	1800	60 ^a	3–6 ^b	Critical care (ICU, ER), internal medical unit, surgical unit, mental health services, nursing homes, elderly care, community health care ^c
Portugal ^{h,i}	4	240	3000–3240	120	9–18 ^b	Internal and specialist medicine ward, surgical and specialist ward, childcare pediatrics, maternity care and obstetrics, mental health and psychiatry, care of the old and geriatrics, palliative care, primary health care, critical care (ICU, ER), and others ^c
Slovakia ^j	3	180	2300–2500	90	6	Internal medicine, surgical department, ICU, psychiatric, pediatrics
Spain ^k	4	240	2300	80–90	7–8 ^b	Critical care (ICU, ER), primary health care, pediatrics, palliative care, hemodialysis

Abbreviations: ECTS, European Credit Transfer and Accumulation System; ICU, intensive care unit; ER, emergency room, OR, operating room.

^aNursing programs are free to increase the number of ECTS/hours devoted to clinical practicums.

^bThe duration of the clinical practicum in the final year is decided by each nursing program, therefore there is a variability across bachelors.

^cClinical practicum places are offered in order to complete the previous clinical experiences, in those contexts recommended by the EU Directive (2005/36/EC).

^dDecree 39/2005.

^eKajander-Unkuri et al. (2014).

^fKaihlanen et al. (2020).

^gDante, Valoppi, Saiani, & Palese (2015).

^hDecree-Law 74 2006.

ⁱAct 9/(2009).

^jAct 131/2002.

^kArrogante (2017); Zabalegui and Cabrera (2009).

about their competence it is important to find the association between competence and the final clinical practicum.

Due to the international mobility of nursing students and registered nurses as well as the development of health care services across borders, an examination is required of how nurses are educated for their profession (Antohe, Riklikiene, Tichelaar, & Saarikoski, 2016). European nursing curricula are guided by EU directive 2013/55/EU and are orientated towards acquisition of competences. The directive includes eight nursing-specific competence requirements that graduating students have to fulfil upon graduation in the EU area. All EU member countries have integrated these competence requirements into their laws, regulations, and administrative provisions. The directive also defines the minimum length of clinical practice, 2300 h (EC, 2013). Although the nursing curricula are guided by the directive, there is some variation between countries concerning aspects such as the total length in years of nursing education and the duration of the

final clinical practicum (Table 1). Despite the fact that the common content of nursing education enables registered nurses to move freely across EU countries, they should also be competent in delivering care in a global international context of practice (Antohe et al., 2016); from an intercultural perspective, however, this is a challenge.

Even though the clinical learning experiences of nursing students in clinical settings across Europe have been explored before (e.g. Gurková, Žiaková, Vörösová, Kudučáková, & Botíková, 2018; Warne et al., 2010), there is limited knowledge as to the value of the final clinical practicum for students' competence development. The pedagogical atmosphere on the ward is related to higher competence levels of graduating nursing students. In addition, supervision by their mentor has been found to support students' competence development extremely well in the final clinical practicum (Kajander-Unkuri et al., 2014). Graduating nursing students' satisfaction with the nursing education has been positively related to higher competence in European countries (Kajander-Unkuri

et al., 2020). The relationship between student and mentor impacts students' satisfaction with the clinical learning environment (e.g. Pitkänen et al., 2018; Warne et al., 2010) and is fundamental to students' learning in that environment (Lee & Chiang, 2020), but research findings on the association of competence development and the student-mentor relationship are scarce. The final clinical practicum where the learning atmosphere is safe and offers challenging learning opportunities offers the best possibilities to support students' competence development (Papastavrou, Dimitriadou, Tsangari, & Andreou, 2016; Warne et al., 2010).

The clinical learning environment can also provide unrealistic expectations of nursing and insufficient learning opportunities; this may complicate the transition by increasing graduating nursing students' feelings of unpreparedness, low self-confidence, insufficient support or training, or being treated as outsiders (Kaihlainen, Salminen, Flinkman, & Haavisto, 2019; van Rooyen et al., 2018). This could lead to an increase of turnover intentions and dissatisfaction with the placements and the nursing education program itself (Collard, Scammell, & Tee, 2020; Kaihlainen et al., 2020). An unsupportive clinical learning environment also impacts students' learning negatively (O'Mara, McDonald, Gillespie, Brown, & Miles, 2014) and increases turnover rates (Collard et al., 2020; Kaihlainen et al., 2020). Promoting learning environments where students feel motivated and involved (Borrott, Day, Sedgwick, & Levett-Jones, 2016) encourages the development of their own learning. It is essential to have an adequate clinical learning environment where students' interpersonal relationships with their peers, mentors, clinical teachers, patients, health equipment, etc. are strengthened (Kaihlainen et al., 2019).

This study is part of the larger "Competence of nursing students in Europe (COMPEUnurse)" research project which aims to evaluate the competence of nurses at the point of graduation and in the early years of practice in Europe and to identify factors related to competence. This study focuses on the final clinical practicum and how it is associated with graduating nursing students' competence.

3 | METHODS

3.1 | Aim

The aim of this study was to explore graduating nursing students' perceptions of their final clinical learning environment and its association with their self-assessed competence, satisfaction with nursing education, and turnover intention at the point of graduation in six European countries.

The research questions were as follows.

1. How do graduating nursing students perceive their final clinical learning environment?
2. Are there differences between countries in graduating nursing students' perceptions of their final clinical learning environment?
3. Are graduating nursing students' perceptions of the final clinical learning environment associated with their self-assessed competence, satisfaction with nursing education, and turnover intentions?

3.2 | Design and sample

A multi-country comparative cross-sectional survey design was used. The target population of the study comprised nursing students at the point of graduation in six European countries (Czech Republic, Finland, Italy, Portugal, Slovakia, and Spain) located in geographically different areas of Europe. The representatives of educational institutions belonging to the Florence Network (<https://theflorencenetwork.coventry.domains/>) from the above-mentioned countries volunteered to participate in the study. The Florence Network, which is one of the oldest nursing and midwifery networks in Europe, consists of 40 higher educational institutions in 18 European countries. The objective of the Florence Network is to develop and improve the quality of European higher education in nursing and midwifery. Convenience sampling was used. The inclusion criteria for the graduating nursing students were the following: (1) studying in a general nursing degree program, and (2) being at the final stage of the program, about to graduate. To achieve a statistical power of 80% and significance level of 0.05 (two-tailed), the minimum sample size in each country was 156 respondents. A total of 4135 graduating nursing students were recruited for the study; 1746 respondents were included in the analysis, giving an overall response rate of 42%, varying from 30% to 97% across the countries.

3.3 | Data collection

The data were collected during the time period February 2018–September 2019 with a questionnaire translated into the languages used in the participating countries (six in all). There was a national research team in every participating country and their responsibility was to recruit as many educational institutions as needed to achieve the sample size goal. The contact person at each educational institution sent the study information letter with the Internet link to the questionnaire to the graduating nursing students by email and the students answered anonymously. The contact person also sent two reminders. If paper-pencil format was used, the contact person gave the study information letter to the students together with an informed consent form to be signed and the paper-pencil format of the questionnaire. Students returned their consent form and the questionnaire to the contact person separately in a sealed envelope.

3.4 | Research instruments

3.4.1 | Clinical Learning Environment and Supervision (CLES)

The Clinical Learning Environment and Supervision (CLES) scale was originally published in 2002 (Saarikoski & Leino-Kilpi, 2002). A new sub-dimension was published in 2008, and the name of the scale was changed to the Clinical Learning Environment, Supervision and Nurse Teacher (CLES+T) evaluation scale (Saarikoski et al., 2008). At the same time, two original sub-dimensions were combined and given a new name. In this

study, we used the CLES+T without the Nurse teacher sub-dimension and used the abbreviation CLES for the four sub-dimensions used. The CLES consists of 28 statements: Pedagogical atmosphere on the ward (9 items); Leadership style of the ward manager (4); Premises of nursing on the ward (4); and Supervisory relationship (11), which includes descriptions of the occupational title of the mentor, method of supervision, and amount of unscheduled supervision sessions between student and mentor. The instrument was chosen based on its wide use across Europe and its previous validation in the countries involved (Antohe et al., 2016; Gurková et al., 2018; Saarikoski et al., 2008; Saarikoski, Marrow, Abreu, Riklikiene, & Özbicakçi, 2007; Tomietto et al., 2012; Vizcaya-Moreno, Pérez-Cañaveras, De Juan, & Saarikoski, 2015). The graduating nursing students were asked to rate their final clinical practicum placement by using a scale from 0 to 10 (0 = extremely bad experience, 10 = extremely good experience). In this study, the Cronbach's alphas for the CLES sub-dimensions ranged from 0.88 to 0.97 (Table 3), in line with a previous European sample (Warne et al., 2010).

3.4.2 | Nurse Competence Scale (NCS)

The Nurse Competence Scale (NCS; Meretoja et al., 2004) consists of 73 items divided into seven competences categories: Helping role (7 items), Teaching-coaching (16), Diagnostic functions (7), Managing situations (8), Therapeutic interventions (10), Ensuring quality (6), and Work role (19). The graduating nursing students were asked to rate their own competence by using a Visual Analogue Scale (VAS) from 0 to 100 (0 = low competence; 100 = high competence; Meretoja et al., 2004). The NCS is widely used internationally, and in previous studies it has shown evidence of validity and reliability (Flinkman et al., 2017). In this study, the Cronbach's alphas for the NCS subscales ranged from 0.84 to 0.93, in line with previous studies with graduating nursing students (Flinkman et al., 2017).

3.4.3 | Turnover intention and satisfaction with nursing education

Turnover intentions were measured in terms of considering changing professions, while satisfaction with nursing education was measured in terms of satisfaction with the nursing program as a whole, satisfaction with the clinical practicum, and satisfaction with theoretical studies (three questions) using a 4-point Likert scale (from 1 = never to 4 = very often and from 1 = very unsatisfied to 4 = very satisfied). All questions were created for the study project.

3.4.4 | Background factors

Some background questions (age, gender, nursing as the 1st study choice, and self-assessed level of study achievements) were posed to describe the sample.

3.5 | Ethical considerations

The study was carried out according to the ethical principles of the Declaration of Helsinki (World Medical Association, 2013) and the European code for responsible conduct of research (All European Academies, 2017). The protocol for the research project was approved by the Ethics Committee of the University of Turku, Finland (Statement 16/2017 6.3.2017). Subsequently, administrative and ethical research approval was obtained in each country. The contact person emailed the web link to the electronic questionnaire to the students during or straight after their final clinical practicum. This email message included an information letter with sufficient details to allow the students to make an informed decision on whether to consent to participate in the study or not. During the data collection phase, the respondents' anonymity was fully protected. Respondents also had the right to interrupt their participation in the study at any time.

Permissions to use and translate the NCS and the CLES+T were obtained from the copyright holders. The CLES+T scale was previously translated and validated in all languages needed in this study. The NCS was double-translated for this study into Spanish, Czech, Portuguese, and Slovakian. In these countries, the translation protocol developed for this study was as follows: forward translation, back-translation, and discussion or reconciliation (Squires et al., 2013). Before starting the data collection, pilot studies were conducted to ensure the understandability of the questionnaire.

3.6 | Data analysis

Continuous variables were summarized with the mean and standard deviation (SD) along with the range, and categorical variables with percentages. Pearson correlation coefficients were calculated. Associations between CLES (total and sub-dimensions) and factors were analyzed with a linear model. The factors studied were country, the three competence groups, and their interactions. Another model included country, satisfaction with the nursing program as a whole, satisfaction with the clinical practicum, and considered to change nursing profession as between-factors in the model added to the country by factor interaction. Interaction studies showed whether the association between CLES and factors differed between countries. The country effect was studied in each statistical model. Assumptions for the model were checked from studentized residuals (residual divided by estimated standard deviation). Confidence intervals (CI) of 95% were calculated for model-based means. All statistical tests were performed as 2-tailed, with significance level set at 0.05. Subjects with missing values were excluded from the analyses. No imputation methods were used. To analyze the association between learning environment and competence, graduating nursing students were divided into three competence groups based on their self-assessed competence (rather good level: VAS mean <50, good level: VAS >50–75, and very good level: VAS >75–100). The analyses were performed using SAS software, version 9.4 for Windows (SAS Institute Inc., Cary, NC, USA).

TABLE 2 Supervision of graduating nursing students in final clinical practicum

Background of supervision	Czech Republic (n = 205–206); n (%)	Finland (n = 321–335); n (%)	Italy (n = 333–334); n (%)	Portugal (n = 335–347); n (%)	Slovakia (n = 304–307); n (%)	Spain (n = 201–203); n (%)	Total (n = 1710–1732); n (%)
Occupational title of the mentor:							
Nurse	106 (51.5)	307 (93.8)	275 (82.3)	184 (54.9)	116 (37.8)	153 (75.4)	1,141 (66.6)
Nurse specialist	28 (13.6)	7 (2.1)	47 (14.1)	39 (11.6)	72 (23.5)	12 (5.9)	205 (12.0)
Assistant ward manager	11 (5.3)	1 (0.3)	0 (0)	95 (28.4)	16 (5.2)	33 (16.3)	156 (9.1)
Sister/ward manager	56 (27.2)	1 (0.3)	9 (2.7)	10 (3.0)	102 (33.2)	0 (0)	178 (10.4)
Other	5 (2.4)	11 (3.4)	3 (0.9)	7 (2.1)	1 (0.3)	5 (2.5)	32 (1.9)
Method of supervision:							
No named mentor at all	28 (13.7)	1 (0.3)	2 (0.6)	5 (1.4)	26 (8.5)	10 (4.9)	72 (4.2)
A personal mentor was named, but the relationship did not work at all	14 (6.8)	10 (3.0)	15 (4.5)	18 (5.2)	21 (6.8)	3 (1.5)	81 (4.7)
The named mentor changed during the placement, even though no change had been planned	5 (2.4)	16 (4.8)	6 (1.8)	17 (4.9)	11 (3.6)	6 (2.9)	61 (3.5)
The mentor varied according to shift or place of work	66 (32.2)	32 (9.6)	28 (8.4)	28 (8.1)	69 (22.5)	64 (31.4)	287 (16.6)
Same mentor had several students, the so-called team supervision	30 (14.6)	5 (1.5)	19 (5.7)	20 (5.8)	105 (34.2)	48 (23.5)	227 (13.1)
Mentor was a so-called personal mentor and the relationship worked in practice	61 (29.8)	244 (72.8)	260 (77.9)	255 (73.5)	72 (23.5)	70 (34.3)	962 (55.5)
Other type	1 (0.5)	27 (8.1)	4 (1.2)	4 (1.2)	3 (1.0)	3 (1.5)	42 (2.4)
Separate private unscheduled supervision with the mentor:							
Not at all	109 (52.9)	25 (7.8)	59 (17.7)	48 (13.9)	126 (41.5)	37 (18.4)	404 (23.6)
Once or twice during the course	39 (18.9)	142 (44.2)	86 (25.8)	75 (21.7)	83 (27.3)	74 (36.8)	499 (29.2)
Less than once a week	15 (7.3)	30 (9.3)	40 (12.0)	34 (9.9)	15 (4.9)	25 (12.4)	159 (9.3)
About once a week	21 (10.2)	71 (22.1)	67 (20.1)	48 (13.9)	20 (6.6)	50 (24.9)	277 (16.2)
More often	22 (10.7)	53 (16.5)	81 (24.3)	140 (40.6)	60 (19.7)	15 (7.5)	371 (21.7)

4 | RESULTS

4.1 | Sample characteristics

A total of 1746 graduating nursing students participated in this study. The majority were female (88%), with a mean age of 24.6 years (range 19–56, SD = 5.5). In all countries, the majority of the graduating nursing students were graduating to their 1st choice profession and rated their level of study achievements as good (Kajander-Unkuri et al., 2020).

4.2 | Perceptions of the clinical learning environment

The majority of the graduating nursing students (55.5%) had a named mentor during their final clinical practicum and the relationship worked in practice; one third had separate private unscheduled supervision with their mentor once or twice during the final clinical practicum (Table 2).

The graduating nursing students' overall perception of their clinical learning environment was positive in all countries, ranging from

TABLE 3 Graduating nursing students' perceptions of their final clinical learning environment and supervision (CLES)

Country	Pedagogical atmosphere on the ward; mean (SD)	Leadership style of the ward manager; mean (SD)	Premises of nursing on the ward; mean (SD)	Supervisory relationship; mean (SD)	Total CLES; mean (SD)
Czech Republic (n = 205–212)	5.6 (2.0) ²	6.4 (2.0) ⁹	6.5 (1.9) ²	5.5 (2.7) ¹	5.9 (1.9)
Finland (n = 333–336)	7.6 (1.8)	6.9 (2.3)	7.2 (1.6)	8.1 (2.0)	7.6 (1.6)
Italy (n = 334–335)	7.8 (1.8)	7.0 (2.1)	7.5 (1.7)	8.1 (1.9)	7.7 (1.6)
Portugal (n = 350–353)	6.8 (1.6) ^{2,3,6}	6.2 (2.2) ^{10, 11}	6.8 (1.7) ^{3,5,6}	7.3 (2.2) ^{3,4}	6.9 (1.6)
Slovakia (n = 306–308)	5.2 (2.0) ¹	5.7 (2.3) ^{2,7,8}	6.0 (2.2) ^{1,7}	5.1 (2.7) ¹	5.4 (2.0)
Spain (n = 201–202)	7.6 (1.7)	6.7 (2.5)	7.3 (1.9)	7.6 (2.1)	7.4 (1.6)
Overall (n = 1,729–1,746)	6.8 (2.1)	6.5 (2.3)	6.9 (1.9)	7.0 (2.5)	6.9 (1.9)
Cronbach's alpha	0.94	0.88	0.85	0.97	0.97

Clinical learning environment and supervision assessed on a scale of 0 (extremely bad experience) to 10 (extremely good experience).

1–11 statistically significant difference between this country and.

¹Finland, Italy, Portugal and Spain $P < 0.0001$.

²Finland, Italy and Spain $P < 0.0001$.

³Italy $P < 0.0001$.

⁴Finland $P < 0.0001$.

⁵Spain $P < 0.05$.

⁶Finland $P < 0.05$.

⁷Czech Republic $P < 0.05$.

⁸Portugal $P < 0.05$.

⁹Italy $P < 0.05$.

¹⁰Italy $P < 0.01$.

¹¹Finland $P < 0.05$.

TABLE 4 Correlations between graduating nursing students' perceptions of clinical learning environment and supervision and competence (Pearson's r)

Competence	Clinical learning environment and supervision				
	Pedagogical atmosphere on the ward	Leadership style of the ward manager	Nursing care on the ward	Supervisory relationship	Total CLES
Helping role (n = 1,693–1709)	0.44*	0.26*	0.39*	0.40*	0.46*
Teaching – Coaching (n = 1,688–1704)	0.38*	0.31*	0.39*	0.33*	0.40*
Diagnostic functions (n = 1,678–1,684)	0.34*	0.28*	0.36*	0.29*	0.37*
Managing situations (n = 1,688–1,696)	0.27*	0.25*	0.33*	0.21*	0.29*
Therapeutic interventions (n = 1,638–1,656)	0.28*	0.26*	0.33*	0.23*	0.31*
Ensuring quality (n = 1,664–1,671)	0.32*	0.23*	0.32*	0.27*	0.33*
Work role (n = 1,629–1,644)	0.26*	0.26*	0.32*	0.20*	0.29*
Overall competence (n = 1,690–1710)	0.38*	0.32*	0.41*	0.32*	0.41*

Significance level.

* $P < 0.0001$.

TABLE 5 Significant differences between competence groups in clinical learning environment and supervision

Competence groups	Clinical learning environment and supervision				
	Pedagogical atmosphere on the ward; mean (SD)	Leadership style of the ward manager; mean (SD)	Premises of nursing on the ward mean (SD)	Supervisory relationship mean (SD)	Total CLES mean (SD)
Group 1 (n = 272; competence <50)	5.9 (2.2) ^{1,2}	5.5 (2.3) ^{1,2}	5.9 (2.0) ^{1,2}	6.0 (2.7) ^{1,2}	5.9 (2.1) ^{1,2}
Czech Republic (n = 33)	5.1 (1.9)	5.4 (2.1)	5.2 (1.9) ^{2,6}	4.3 (2.4) ⁴	4.9 (1.7) ⁷
Finland (n = 51)	6.6 (2.1) ²	5.9 (2.3) ⁷	6.3 (1.5) ²	7.3 (2.4) ⁴	6.7 (1.8) ²
Italy (n = 35)	6.8 (1.5) ²	6.1 (2.0) ⁴	6.4 (1.7) ²	7.4 (1.9)	6.8 (1.4) ⁷
Portugal (n = 32)	5.9 (1.5) ⁷	5.3 (1.9) ⁴	6.2 (1.6) ⁴	6.4 (2.0)	6.0 (1.4) ⁷
Slovakia (n = 99)	4.2 (2.0) ²	4.7 (2.3) ^{2,7}	4.9 (2.0) ^{1,2}	4.2 (2.5) ^{4,6}	4.4 (2.0) ²
Spain (n = 22)	6.9 (2.1)	5.8 (2.3)	6.7 (1.9)	6.3 (2.2) ⁴	6.5 (1.8) ⁴
Group 2 (n = 999; competence >50–75)	6.7 (2.0) ³	6.4 (2.2) ³	6.8 (1.8) ³	6.9 (2.4) ³	6.7 (1.8) ³
Czech Republic (n = 121)	5.5 (1.9)	6.3 (1.9)	6.4 (1.7)	5.3 (2.7)	5.7 (1.8)
Finland (n = 211)	7.5 (1.8) ⁵	6.8 (2.3)	7.1 (1.5)	8.0 (1.9)	7.5 (1.6)
Italy (n = 184)	7.6 (1.8) ⁵	6.8 (2.1)	7.3 (1.7) ⁸	7.8 (1.9)	7.5 (1.6) ⁵
Portugal (n = 205)	6.6 (1.5) ³	6.0 (2.1) ⁵	6.7 (1.6) ⁵	7.1 (2.1)	6.7 (1.5) ⁵
Slovakia (n = 168)	5.5 (1.8)	6.0 (2.1)	6.2 (2.1) ⁵	5.4 (2.6)	5.7 (1.8)
Spain (n = 110)	7.3 (1.7)	6.3 (2.4) ⁵	7.0 (1.9)	7.4 (2.1)	7.2 (1.6)
Group 3 (n = 439; competence >75–100)	7.5 (1.8)	7.3 (2.1)	7.8 (1.7)	7.7 (2.3)	7.6 (1.7)
Czech Republic (n = 48)	6.3 (2.1)	7.0 (2.2)	7.4 (1.8)	6.6 (2.8)	6.7 (1.9)
Finland (n = 74)	8.5 (1.4)	7.8 (1.9)	8.2 (1.5)	8.8 (1.7)	8.5 (1.1)
Italy (n = 115)	8.5 (1.5)	7.6 (2.0)	8.3 (1.5)	8.6 (1.8)	8.4 (1.4)
Portugal (n = 95)	7.7 (1.6)	7.0 (2.3)	7.6 (1.9)	7.8 (2.3)	7.6 (1.6)
Slovakia (n = 39)	6.1 (2.0)	6.8 (2.1)	7.4 (1.9)	6.0 (3.0)	6.4 (1.8)
Spain (n = 68)	8.1 (1.5)	7.6 (2.3)	8.0 (1.7)	8.3 (1.9)	8.1 (1.4)

Clinical learning environment and supervision assessed with the Visual Analogue Scale (VAS) 0–10.

¹Statistically significant difference between group 1 and 2 $P < 0.001$.

²Statistically significant difference between group 1 and 3 $P < 0.001$.

³Statistically significant difference between group 2 and 3 $P < 0.001$.

⁴Statistically significant difference between group 1 and 3 $P < 0.05$.

⁵Statistically significant difference between group 2 and 3 $P < 0.05$.

⁶Statistically significant difference between group 1 and 2 $P < 0.05$.

⁷Statistically significant difference between group 1 and 3 $P < 0.01$.

⁸Statistically significant difference between group 2 and 3 $P < 0.01$.

5.4 to 7.7 (mean = 6.9, SD = 1.9) on the scale from 0 (extremely bad) to 10 (extremely good). The most positive perceptions were in the Supervisory relationship sub-dimension (mean = 7.0, SD = 2.5). The Leadership style of the ward manager was the least positively perceived sub-dimension (mean = 6.5, SD = 2.3). Country-level analysis revealed that the perceptions were most positive among Italian (mean = 7.7, SD = 0.6), Finnish (mean = 7.6, SD = 1.6), and Spanish students (mean = 7.4, SD = 1.6). The least positive perceptions were seen among graduating nursing students from the Czech Republic (mean = 5.9, SD = 1.9) and Slovakia (mean = 5.4, SD = 2.0). Overall,

the differences between countries were statistically significant ($P < 0.0001$; Table 3).

4.3 | Learning environment and its association with competence

The graduating nursing students assessed their overall competence mean on the VAS as 64.5 (SD 14.8), which corresponds to the range for a good level (50–75). The correlation between the graduating nursing

TABLE 6 Significant differences between groups of turnover intentions, satisfaction with nursing education, satisfaction with clinical practicum and clinical learning environment and supervision

(1) considered to change the profession, (2) satisfaction with nursing program as whole, (3) satisfaction with clinical practicum	Clinical learning environment and supervision				
	Pedagogical atmosphere on the ward; adjusted mean (95% CI)	Leadership style of the ward manager; adjusted mean (95% CI)	Premises of nursing on the ward; adjusted mean (95% CI)	Supervisory relationship; adjusted mean (95% CI)	Total CLES; adjusted mean (95% CI)
(1) fairly often/very often (<i>n</i> = 234)	5.8 (5.6–6.1) ¹	5.8 (5.4–6.1) ¹	6.3 (6.0–6.5) ¹	6.1 (5.8–6.5) ¹	6.0 (5.8–6.3) ¹
Czech Republic (<i>n</i> = 39)	5.1 (4.6–5.7)	5.9 (5.2–6.6)	6.0 (5.4–6.5)	4.9 (4.1–5.6)	5.3 (4.8–5.8)
Finland (<i>n</i> = 50)	6.5 (6.0–7.0)	5.8 (5.2–6.4)	6.3 (5.8–6.8)	6.9 (6.3–7.5)	6.5 (6.0–6.9)
Italy (<i>n</i> = 25)	6.1 (5.4–6.8)	6.4 (5.5–7.3)	6.4 (5.7–7.1)	6.7 (5.8–7.6)	6.4 (5.8–7.1)
Portugal (<i>n</i> = 71)	6.2 (5.8–6.7)	5.7 (5.2–6.2)	6.1 (5.6–6.5)	6.5 (6.0–7.0)	6.2 (5.8–6.6)
Slovakia (<i>n</i> = 37)	4.2 (3.7–4.8)	4.8 (4.1–5.5)	5.5 (4.9–6.1)	4.8 (4.0–5.5)	4.7 (4.2–5.3)
Spain (<i>n</i> = 12)	6.8 (5.7–7.8)	6.0 (4.7–7.3)	7.3 (6.3–8.4)	7.3 (5.9–8.6)	7.0 (6.0–8.0)
(1) never/fairly seldom (<i>n</i> = 1,512)	6.9 (6.8–7.0)	6.6 (6.5–6.7)	7.0 (6.9–7.1)	7.1 (6.9–7.2)	6.9 (6.8–7.0)
Czech Republic (<i>n</i> = 173)	5.8 (5.5–6.0)	6.5 (6.2–6.9)	6.6 (6.3–6.8)	5.6 (5.3–6.0)	6.0 (5.7–6.2)
Finland (<i>n</i> = 281)	7.8 (7.6–8.0)	7.1 (6.8–7.3)	7.4 (7.2–7.6)	8.3 (8.0–8.6)	7.8 (7.6–8.0)
Italy (<i>n</i> = 310)	8.0 (7.8–8.2)	7.0 (6.8–7.3)	7.6 (7.4–7.8)	8.2 (7.9–8.4)	7.8 (7.7–8.0)
Portugal (<i>n</i> = 284)	7.0 (6.7–7.2)	6.4 (6.1–6.6)	7.0 (6.8–7.2)	7.4 (7.2–7.7)	7.0 (6.8–7.2)
Slovakia (<i>n</i> = 272)	5.3 (5.1–5.5)	5.8 (5.5–6.0)	6.0 (5.8–6.2)	5.2 (4.9–5.4)	5.5 (5.3–5.7)
Spain (<i>n</i> = 192)	7.6 (7.3–7.8)	6.7 (6.4–7.0)	7.3 (7.1–7.6)	7.6 (7.3–7.9)	7.5 (7.2–7.7)
(2) very unsatisfied/unsatisfied (<i>n</i> = 189)	6.2 (5.9–6.5) ¹	5.7 (5.4–6.1) ¹	6.4 (6.1–6.7) ¹	6.2 (5.9–6.5) ¹	6.2 (5.9–6.4) ¹
Czech Republic (<i>n</i> = 49)	5.2 (4.7–5.7)	5.9 (5.3–6.5) ³	5.9 (5.4–6.4)	4.5 (3.8–5.1)	5.2 (4.7–5.7)
Finland (<i>n</i> = 32)	7.6 (6.9–8.2)	6.9 (6.1–7.6) ³	7.1 (6.5–7.7)	7.6 (6.9–8.4)	7.4 (6.8–8.0) ³
Italy (<i>n</i> = 22)	7.8 (7.0–8.5)	7.0 (6.1–7.9) ³	7.8 (7.0–8.5)	8.2 (7.2–9.1)	7.8 (7.1–8.5) ³
Portugal (<i>n</i> = 35)	6.1 (5.5–6.7)	5.2 (4.5–6.0)	6.0 (5.4–6.7)	6.5 (5.7–7.2)	6.1 (5.5–6.6)
Slovakia (<i>n</i> = 33)	4.4 (3.9–5.0)	4.8 (4.0–5.5)	5.3 (4.6–5.9)	4.5 (3.7–5.2)	4.6 (4.1–5.2)
Spain (<i>n</i> = 18)	6.1 (5.3–7.0)	4.7 (3.7–5.7)	6.3 (5.4–7.1)	6.0 (5.0–7.0)	6.0 (5.2–6.7)
(2) satisfied/very satisfied (<i>n</i> = 1,552)	6.9 (6.8–6.9)	6.6 (6.5–6.7)	7.0 (6.9–7.1)	7.1 (7.0–7.2)	6.9 (6.8–7.0)
Czech Republic (<i>n</i> = 163)	5.8 (5.5–6.0)	6.6 (6.2–6.9)	6.7 (6.4–6.9)	5.8 (5.5–6.2)	6.1 (5.8–6.3)
Finland (<i>n</i> = 301)	7.6 (7.4–7.8)	6.9 (6.6–7.1)	7.2 (7.0–7.5)	8.1 (7.9–8.4)	7.6 (7.4–7.7)
Italy (<i>n</i> = 313)	7.8 (7.6–8.0)	7.0 (6.8–7.2)	7.5 (7.3–7.7)	8.1 (7.8–8.3)	7.7 (7.6–7.9)
Portugal (<i>n</i> = 313)	6.9 (6.7–7.1)	6.3 (6.1–6.6)	6.9 (6.7–7.1)	7.4 (7.1–7.6)	7.0 (6.8–7.2)
Slovakia (<i>n</i> = 275)	5.3 (5.1–5.5)	5.8 (5.5–6.0)	6.0 (5.8–6.2)	5.2 (5.0–5.5)	5.5 (5.3–5.7)
Spain (<i>n</i> = 187)	7.7 (7.4–7.9)	6.9 (6.5–7.2)	7.4 (7.2–7.7)	7.8 (7.4–8.1)	7.6 (7.3–7.8)
(3) very unsatisfied/unsatisfied (<i>n</i> = 156)	5.9 (5.6–6.2) ¹	5.9 (5.5–6.3) ²	6.2 (5.9–6.6) ¹	5.6 (5.2–6.0) ¹	5.9 (5.6–6.2) ¹
Czech Republic (<i>n</i> = 47)	4.9 (4.4–5.4)	5.9 (5.3–6.5)	5.7 (5.1–6.2)	4.1 (3.4–4.7)	5.0 (4.5–5.4)
Finland (<i>n</i> = 16)	6.6 (5.8–7.5)	6.1 (5.0–7.2)	6.8 (5.9–7.7)	6.4 (5.3–7.4)	6.6 (5.8–7.4)
Italy (<i>n</i> = 20)	7.3 (6.5–8.1)	6.3 (5.4–7.3)	7.1 (6.3–7.9)	7.2 (6.3–8.2)	7.1 (6.4–7.8)
Portugal (<i>n</i> = 13)	6.2 (5.2–7.2)	6.4 (5.2–7.7)	6.2 (5.2–7.3)	5.7 (4.4–6.9)	6.1 (5.1–7.0)

TABLE 6 (Continued)

(1) considered to change the profession, (2) satisfaction with nursing program as whole, (3) satisfaction with clinical practicum	Clinical learning environment and supervision				
	Pedagogical atmosphere on the ward; adjusted mean (95% CI)	Leadership style of the ward manager; adjusted mean (95% CI)	Premises of nursing on the ward; adjusted mean (95% CI)	Supervisory relationship; adjusted mean (95% CI)	Total CLES; adjusted mean (95% CI)
Slovakia (n = 44)	4.0 (3.5–4.5)	4.6 (3.9–5.2)	4.9 (4.4–5.4)	3.6 (3.0–4.3)	4.1 (3.6–4.6)
Spain (n = 16)	6.4 (5.5–7.3)	6.1 (5.0–7.1)	6.8 (5.9–7.7)	6.8 (5.7–7.9)	6.6 (5.8–7.4)
(3) satisfied/very satisfied (n = 1,580)	6.9 (6.8–7.0)	6.6 (6.5–6.7)	7.0 (6.9–7.1)	7.1 (7.0–7.2)	6.9 (6.8–7.0)
Czech Republic (n = 165)	5.8 (5.6–6.1)	6.6 (6.2–6.9)	6.7 (6.4–7.0)	5.9 (5.6–6.2)	6.1 (5.9–6.4)
Finland (n = 315)	7.7 (7.5–7.9)	6.9 (6.7–7.2)	7.3 (7.1–7.5)	8.2 (8.0–8.4)	7.7 (7.5–7.8)
Italy (n = 313)	7.9 (7.7–8.1)	7.0 (6.8–7.3)	7.6 (7.3–7.8)	8.1 (7.9–8.4)	7.8 (7.6–8.0)
Portugal (n = 337)	6.9 (6.7–7.0)	6.2 (6.0–6.5)	6.8 (6.6–7.0)	7.4 (7.1–7.6)	6.9 (6.7–7.1)
Slovakia (n = 261)	5.4 (5.2–5.6)	5.9 (5.6–6.1)	6.1 (5.9–6.4)	5.4 (5.1–5.7)	5.6 (5.4–5.8)
Spain (n = 189)	7.6 (7.4–7.9)	6.7 (6.4–7.0)	7.4 (7.1–7.6)	7.7 (7.4–8.0)	7.5 (7.2–7.7)

Clinical learning environment and supervision assessed with the Visual Analogue Scale (VAS) 0–10.

¹Statistically significant difference between groups $P < 0.001$.

²Statistically significant difference between groups $P < 0.01$.

³Statistically significant lower difference in association between groups in this country and Spain $P < 0.01$.

students' perceptions of their clinical learning environment and competence was statistically significant and positive ($r = 0.41$, $P < 0.0001$). There was also a statistically significant positive correlation between every competence category and every CLES sub-dimension. The strongest correlations were seen between the Helping role and Pedagogical atmosphere on the ward ($r = 0.44$, $P < 0.0001$) and the Helping role and Supervisory relationship ($r = 0.40$, $P < 0.0001$; Table 4).

The graduating nursing students were divided into three competence groups based on their self-assessed competence (rather good level: VAS < 50, good level: VAS > 50–75, and very good level: VAS > 75–100). Over half of the graduating nursing students (58.4%) were at the good level. Graduating nursing students with a very good competence level had a more positive perception of their clinical learning environment than those with a rather good level or good level ($P < 0.0001$). The difference in total CLES was also statistically significant in several countries. However, the association between total CLES or CLES sub-dimensions and competence groups did not differ significantly between the countries (Table 5).

4.4 | Clinical learning environment and its association with satisfaction with nursing education and turnover intention

The graduating nursing students were divided into two groups based on their considerations of changing their profession (never/fairly seldom, vs fairly often/very often), satisfaction with the nursing program as a whole (very unsatisfied/unsatisfied, vs satisfied/very satisfied), and satisfaction with the clinical practicum (very unsatisfied/

unsatisfied, vs satisfied/very satisfied). Graduating nursing students who had never or fairly seldom considered changing their profession, who were satisfied or very satisfied with the nursing program as a whole, and who were satisfied or very satisfied with their clinical practicum had more positive perceptions of their final clinical learning environment ($P < 0.0001$). The differences between the groups were statistically significant in all CLES sub-dimensions as well (Table 6).

There were statistically significant differences between graduating nursing students from Spain and Italy ($P = 0.0032$), and between graduating nursing students from Spain and Finland ($P = 0.0070$), in the association between satisfaction with the nursing program as a whole and perceptions of the final clinical learning environment. In Italy and Finland, there was no clear association between satisfaction with the nursing program as a whole and the total CLES, whereas in Spain, a positive association was seen (Table 6).

5 | DISCUSSION

This study explored graduating nursing students' perceptions of their final clinical learning environment and its associations with self-assessed competence, satisfaction with nursing education, and turnover intentions at the point of graduation in six European countries.

Based on the results, the graduating nursing students' perceptions of their final clinical learning environment were positive, especially in the Supervisory relationship. This is congruent with earlier studies carried out in some European countries (e.g. Warne et al., 2010). Students have previously evaluated a supportive student-mentor relationship as well as the mentor's actions and characteristics as the

most influential factors in their satisfaction with the final clinical learning environment (Antohe et al., 2016; Papastavrou et al., 2016), and these factors have been shown to have a significant effect on the outcomes of students' experiences (Pitkänen et al., 2018). The results of this study showed that the more positive the graduating nursing students' perceptions about their final clinical learning environment were, the better their self-evaluated competence (see Battistelli, Galletta, Vandenberghe, & Odoardi, 2016; Numminen et al., 2016); this is a meaningful result in terms of the development of education and clinical training placements. A significant and positive correlation was found between every competence category and every CLES sub-dimension, highlighting the strongest association between the Helping role and Pedagogical atmosphere on the ward and the Supervisory relationship. All in all, similar to earlier studies (Saarikoski et al., 2007; Saukkoriipi et al., 2020), in this study the supervisory relationship and a good mentor were found to be some of the main elements supporting students' competence development. Moreover, it seems that in the future, the mentors' role will be even greater as the role of teachers is decreasing as a result of diminishing resources in many countries (Immonen et al., 2019). This must be taken into account when conducting mentor education. Factors related to the final clinical practicum, such as the systematic nature of the practicum, enhanced the students' possibilities to address their potential competence deficiencies, and simultaneously, improve on those confidence deficiencies before stepping into the nurse role. It indicates that well-organized practicum placements serve students' individual learning needs and promote better competence (Kaihlainen et al., 2020).

Italian, Finnish, and Spanish students had the most positive perceptions of their clinical learning environment while those of students from the Czech Republic and Slovakia were the least positive. This could be explained by the wide variation in the organization of clinical placements, supervisory models, or by inconsistencies in defining responsibility for clinical education between countries (Gurková et al., 2018). In some countries, the students had no mentor at all. Students with a named mentor have been more satisfied with their supervisory relationship and clinical learning environment in previous studies (Antohe et al., 2016; Saukkoriipi et al., 2020). However, in a recent review (Forber et al., 2016), no single optimal mentoring model was found. Arranging a named mentor could be challenging for health care organizations for reasons related to factors such as cost-effectiveness, shortage of staff, and busy workloads. Clinical education wards have shown potential for enhancing students' learning. In a clinical education ward, the mentor's role is to facilitate students' learning as part of a team, challenging students' independence, responsibility, and evidence-based practice (Manninen, Henriksson, Scheja, & Silén, 2015). However, mentors need training in this pedagogical role, and this kind of team mentoring and students' learning in a clinical education ward should be studied further from the viewpoint of cost-effectiveness as well.

In addition, private scheduled supervision sessions with the mentor during the practicum have been found meaningful (Immonen et al., 2019; Saukkoriipi et al., 2020); however, in this study, in some countries the students did not have any sessions of this kind, which might influence graduating nursing students' perceptions. In a clinical education ward,

mentors discuss and reflect continuously with the students, helping them to find answers to problems related to patient care, which supports students' competence development (Manninen et al., 2015). The clinical education ward also provides a possibility to enhance peer learning where students can reflect on their learning together.

Based on our results, it seems that in order to achieve a very good level of competence, the quality of the final clinical learning environment needs to be 7.6 (on the scale of 0–10). For developing the quality of clinical learning environments, systematic and evidence-based evaluation based on common quality requirements is needed (see Meretoja, Tarr, & Strandell-Laine, 2017). A definition of a good quality clinical learning environment is needed to ensure the quality of European nursing education. This calls for more research and testing.

Nurse turnover is an international issue of concern and there is evidence suggesting that positive perceptions of the transition and educational preparation are associated with better opportunities to prepare for the responsibilities required of being a nurse during the practicum (Kaihlainen et al., 2020). Graduating nursing students who had never or only seldom considered changing their profession had more positive perceptions of their clinical learning environment, in line with practicing nurses' perceptions of their practice environment (Numminen et al., 2016). Our results also show that satisfaction with nurse education promotes intentions to stay in the nursing profession. Enhancing positive transition experiences both before and after graduation as a nurse should reduce turnover, leading to lower health care costs as well as safer and higher-quality patient care.

5.1 | Strengths and limitations

The main strength of this study are the instruments. Both instruments employed in this study are used internationally and their validity and reliability are established. In this study, the internal consistency of both instruments was in line with previous studies (Flinkman et al., 2017; Warne et al., 2010). The study has limitations related to the sample, which was convenient in each participating country. This, along with the modest response rate of 42%, raises concern about representativeness. However, as far as we can tell, this is the first study where comparisons of students' perceptions of their clinical learning environment in different countries have been analyzed and reported in a sample size based on power analysis. Second, the data collection took 1.5 years, which might have an effect on the results. However, according to our information, there were no changes in the nursing curricula in the participating countries. Overall, only preliminary conclusions and cautious generalizations can be made.

6 | CONCLUSIONS

Graduating nursing students' positive perceptions of their clinical learning environment are associated with a better level of self-assessed competence and satisfaction with the nursing education program and clinical practicum; this might lead to lower turnover

intentions. The most positive factors, the Supervisory relationship and Pedagogical atmosphere sub-dimensions of the CLES, contribute especially to better achievement of graduating nursing students' competence. A systematic, evidence-based evaluation of clinical learning environments with common quality requirements should be established, including definition of the level of good quality clinical learning environment across Europe.

7 | RELEVANCE FOR CLINICAL PRACTICE

The results of this study have relevance for organizing the final clinical practicum. The supervisory relationship and a good mentor were found to be some of the main elements supporting the competence development of students. This is an important signal for health care organizations when arranging mentoring for nursing students. Well-organized practicum placements serve students' individual learning needs and promote opportunities for collecting evidence of competence at graduation; this could lead to a lower number of clinical errors as well as safer and higher quality patient care. In addition, every effort should be made to prevent nurses leaving their profession, and provision of a good quality clinical learning environment during the final clinical practicum seems to be one factor that might lead to lower turnover intentions.

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AUTHOR CONTRIBUTIONS

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DATA AVAILABILITY STATEMENT

Author elects to not share data

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