Unfinished nursing care occurrence, priority order and reasons as perceived by nursing students: An international study

Stefania Chiappinotto [a,*,1], Aysun Bayram [b,*,1], Tommaso Lupi [a], Seher Basaran-Acil [c], Elena Gurkovà [d], Öznur İspir Demir [e], Dominika Kohanová [f], Aysel Özsaban [b], Luca Grassetti [g], Alvisa Palese [a]

[a] University of Udine, Department of Medicine, Udine 33100, Italy
[b] Karadeniz Technical University, Faculty of Health Sciences, Department of Fundamentals Nursing, Trabzon, Türkiye
[c] Hacettepe University Faculty of Nursing, Nursing Services Administration Department, Ankara, Türkiye
[d] Elena Gurkova, University of Prešov, Faculty of Health Care, Department of Nursing, Prešov 08001, Slovakia
[e] Osmaniye Korkut Ata University, Faculty of Health Sciences, Department of Gerontology, Osmaniye, Türkiye
[f] Constantine the Philosopher University in Nitra, Faculty of Social Sciences and Health Care, Department of Nursing, Nitra 949 01, Slovakia
[g] University of Udine, Department of Economy and Statistic, Udine 33100, Italy

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ABSTRACT

Aim: The study aimed to measure and compare differences (a) in the unfinished nursing care interventions overall and the order in which they are left unfinished; and (b) in the underline reasons, as perceived by Italian, Slovak and Turkish nursing students.

Background: In recent years, in the nursing education context a novel line of research in the field of unfinished nursing care as those interventions required by patients, but omitted or delayed, has emerged. However, no studies have been conducted at the international level.

Design: An international, comparative cross-sectional study was performed in 2022–2023 and reported here according to Strengthening the Reporting of Observational Studies in Epidemiology guidelines.

Methods: A multinational research network was formed with a convenient sample of 13 universities and 60 campuses (4595 students). The Unfinished Nursing Care Survey for Students (UNCS4S) was administered. A total of 1850 students participated.

Results: According to the UNCS4S total score, Italians reported an average 50.9 out of 110 unfinished nursing care interventions (CI95 % 47.6–54.1), Slovakians 54.9 (CI95 % 53.7–56.1) and Turkish students 50.4 (CI95 % 49.2–51.5) (p<0.001). Some interventions were reported more often as unfinished across countries as supervising the task assigned to the nursing aides, going to the patient without being called, spending the required time with the patient and their caregivers and emotionally supporting patients and their caregivers. In terms of reasons, total scores were statistically different across countries (Italy: 45.92 out of 90, CI95 % 43.91–47.9; Slovakia: 62, CI95 % 61.02–62.98; Türkiye: 72.29, CI95 % 71.13–73.45; p<0.001); however, at the factor level, communication issues, lack of material resources and issues in supervision of nursing aides were reported in all countries as the most important reasons of the unfinished nursing care.

Conclusions: Students learn to shape and set priorities early in their nursing careers with similar order in what to leave unfinished as first, despite the different educational structures, care cultures and healthcare systems. Among the unfinished nursing care reasons perceived, the most influential were similar across countries, suggesting common areas for improvement. How to better prepare students to be resilient and capable of managing the challenges posed by unfinished nursing care episodes due to the lack of resources and communications issues should be considered as a priority by nurse educators.

* Corresponding authors.
  E-mail addresses: stefania.chiappinotto@uniud.it (S. Chiappinotto), aysunbayram@ktu.edu.tr (A. Bayram), tommaso.lupi@uniud.it (T. Lupi), seherb08@hacettepe.edu.tr (S. Basaran-Acil), elena.gurkova@unipo.sk (E. Gurkovà), dkohanova@ukf.sk (D. Kohanová), ayselozsaban@ktu.edu.tr (A. Özsaban), luca.grassetti@uniud.it (L. Grassetti), alvisa.palese@uniud.it (A. Palese).
  [1] co-first authors

1. Introduction

In the last few years, a novel line of research involving nursing students has emerged in the field of unfinished nursing care, as those interventions required by patients but omitted or delayed. During their clinical rotations, students gain experience in different settings and compare with acquired theoretical knowledge regarding how nursing care should be delivered. This potentially provides students with a "*fresh pair of eyes*" (Leedham-Green, Knight and Iedema, 2019), seeing care as it is offered and critically reporting its main issues, a capacity that nurses living the practice as insiders may have lost given the normalization process and critical aspects being rendered acceptable (Francis, 2015).

Although a debate has been initiated regarding nursing students' involvement in measuring unfinished care, their point of view can be valuable as informants on the quality of service and the changes required in nursing education (Palese et al., 2023a) and to prevent normalization (Bagnasco et al., 2017). However, as recently reported in a rapid review, few studies have been conducted to date and those available are mainly qualitative, monocentric and at a single country level (Palese et al., 2023a). Therefore, the intent of this study was to expand the available knowledge regarding unfinished care and the reasons for it, as perceived by nursing students at the international level.

2. Background

Only six qualitative (Dimitriadou et al., 2021; Gibbon and Crane, 2018; Habermann, Stemmer and Suhonen, 2021; Kalánková et al., 2021; Kalfoss, 2017; Najafi, Nikbakht Nasrabadi and Mardanian Dehkordi, 2021) and two quantitative studies (Palese et al., 2021; Kohanová, Bartoníčková and Žiaková, 2024a) have been published to date in the field of unfinished care and nursing students (Palese et al., 2023a). The main aims of all these studies were to understand students' perceptions regarding the unfinished nursing care phenomenon, whether they were familiar with this issue and the underlying reasons for it. Specifically, qualitative studies available have provided evidence in different aspects: (a) the influence of the socialization processes leading to the normalization of unfinished nursing care episodes among students (Gibbon and Crane, 2018); (b) the experiences, emotions and ethical conflicts as lived by them when witnessing and/or deciding what to leave unfinished (Najafi, Nikbakht Nasrabadi and Mardanian Dehkordi, 2021; Habermann, Stemmer and Suhonen, 2021); (c) the impact on learning opportunities (Habermann, Stemmer and Suhonen, 2021); and (d) the perceptions of unfinished nursing care during their clinical rotations (Dimitriadou et al., 2021). Moreover, two studies investigated the strategies enacted by students to deal with unfinished care (Habermann, Stemmer and Suhonen, 2021; Kalánková et al., 2021), such as feeling part of the team, developing self-help techniques, or discussing with other students, friends or family members.

On the other side, quantitative studies conducted in Italy and Slovakia have used the Unfinished Nursing Care Survey for Students (UNCS4S) tool (Kohanová, Bartoníčková and Žiaková, 2024a; Palese et al., 2021) documenting that the most frequent unfinished activities were 'Going to patients without being called', 'Supervising the tasks assigned to the nurse aides' and 'Spending time with patients and their caregivers', whereas 'Providing the personal hygiene', 'Recording vital signs' and 'Performing bedside glucose monitoring' were the least often unfinished (Kohanová, Bartoníčková and Žiaková, 2024a; Palese et al., 2021). The underlying perceived reasons have been reported similarly in the two countries and regarded the lack of human resources, the workflow unpredictability and the communication issues (Kohanová, Bartoníčková and Žiaková, 2024a; Palese et al., 2021). Alongside these reasons, students have reported difficulties in defining priorities and in optimizing the use of time, especially under stressful conditions (Dimitriadou et al., 2021; Habermann, Stemmer and Suhonen, 2021; Kalánková et al., 2021). Furthermore, students have been reported to be pressured by their clinical mentors to provide care not always in line

with what was learned on a theoretical level (Dimitriadou et al., 2021; Habermann, Stemmer and Suhonen, 2021). They adhered to the established routines as recommended by physicians or clinical tutors (Dimitriadou et al., 2021; Kalánková et al., 2021) mainly because they felt incompetent or afraid to make independent decisions (Habermann, Stemmer and Suhonen, 2021; Kalánková et al., 2021). Therefore, students have been documented as undergoing a normalization process regarding unfinished nursing care episodes, implying a pragmatic acceptance of the care left undone (Gibbon and Crane, 2018; Palese et al., 2021). However, to date, only studies on a single country level have been conducted, limiting comparison across countries regarding students' unfinished care perceptions and the reasons attributed. Despite the continuous process of harmonization in the aims and in the structure of the general nursing education as addressed by the European Directives across Europe (European Union, 2024) and by professional and scientific bodies (e.g., Understanding Development Issues in Nurse Educator Careers – UDINE-C network; European Federation of Nurse Educators - FINE), differences across countries are still present. Involving countries with different educational structures, legislations and processes may advance knowledge and provide insights into what is most effective in education to prevent this phenomenon.

2.1. Aim

The study aimed to measure and compare differences (a) in the unfinished nursing care interventions overall and in the order in which they are left unfinished and (b) in the underline reasons, as perceived by Italian, Slovak and Turkish nursing students.

3. Methods

3.1. Study design

An international, comparative cross-sectional study was performed in 2022–2023 and reported here according to the Strengthening the Reporting of Observational Studies in Epidemiology Statement including cross sectional studies (von Elm et al., 2007; Supplementary Material 1).

3.2. Setting and population

The research team involved nurses and a statistician working at the university level in Italy, Türkiye and Slovakia. A convenient sample of universities offering Bachelor's degrees and their campuses were approached in each country. All those invited agreed to participate. Thus, an international network of one Italian, three Turkish and nine Slovakian universities was composed. Firstly, the main characteristics of the nursing degrees were described with a data collection tool piloted in one country (Italy) and then filled in by all partners. Participants' degrees were all established in public universities, affiliated with the medical (Italy) and medical and health care science (Slovakia and Türkiye) departments. The universities offered from one (Türkiye) to 13 campuses (Slovakia) in the same city of the university and were decentralized in other cities; the number of nursing students ranged from 65 to 1006 (total 4595). The duration of the degree was from three (Italy and Slovakia) to four or five years (Türkiye), requiring from 1500 hours clinical hours (Italy) up to 2300 (Slovakia) and between 1380 and 1680 in Türkiye, with a variable number of clinical rotations over the nursing education, from six to 11 (Supplementary Table 2).

In the established settings of research, we considered eligible all students attending the nursing education during the study period, without establishing a priori the sample size according to the descriptive and comparative nature of the study design. Specifically, all students (a) who were attending the last week of their clinical rotation; and (b) who voluntarily agreed to participate, were included. Therefore, students who had been attending (a) the clinical internship for fewer than seven

days or had just started, thus without the required experience in the unit to report the unfinished care; (b) who were attending their clinical rotation in some specific settings (e.g. operating theatre, radiology unit); or (c) who had only received their education in classrooms or skill labs, were all excluded.

3.3. Data collection tool

The questionnaire was composed of two parts. The first part (24 closed-ended questions) was developed based on previous studies (Lunardelli et al., 2021; Najafi, Nikbakht Nasrabadi and Mardanian Dehkordi, 2021; Palese et al., 2021) and concerned: (a) socio-demographic information (age, gender, civil status, previous work experience); (b) data on nursing education attended (academic year, previous clinical rotations and places); (c) current clinical rotation (hours/week in the unit/ward, number of patients cared for, tutorial model); (d) the degree of adequacy of nursing resources at the unit level; and (e) the degree of achievement of expected learning outcomes as perceived by students.

The second part included the UNCS4S validated in the Italian language and context (Palese et al., 2021). The UNCS4S is composed of two sections. Section A included 22 items where students were asked to report how often these 22 interventions were omitted or delayed in the last seven days of their clinical rotation by using a five-point Likert scale from 1 (never) to 5 (always), thus resulting in a total score ranging from 22 to 110. Section B provided 18 items indicating all possible reasons for unfinished nursing care, where students were also asked to indicate the perceived role played by these reasons, by using a five-point Likert scale from 1 (not a significant reason) to 5 (very significant reason), thus resulting in a total score from 18 to 90. To allow its use by Turkish and Slovak students, linguistic and cultural validation processes were performed according to Beaton et al. (2000) (data available from authors); in Italy, the UNCS4S was administered as it was validated (Palese et al., 2021).

In all countries, a pilot phase involving ten students was performed to assess the data collection tool feasibility and understandability. No changes were required and these data were not included in the final analysis.

3.4. Data collection process

Data were collected between 2022 and 2023 in the appropriate semester when students attended their clinical rotations. Students were first informed about the aims and the study procedures by a researcher appointed at the university level. They then received a link to the Google Form survey in Italy and Türkiye, displaying the informed consent on the first page. When approved, the questionnaire sections required an average of 15–20 minutes in total. In Slovakia, data collection was done on paper. In all universities, students were encouraged to fill in the tool during their clinical placement in an appropriate setting, without any help (e.g., clinical instructor).

3.5. Statistical analysis

Descriptive statistical analysis was used to describe the main characteristics of the participants with averages, confidence intervals (CI95 %), frequencies and percentages. Statistical differences across countries were explored with ANOVA and chi-squared tests. The univariate analysis between continuous measures was performed with Pearson's parametric (r) or Spearman's rank (rS) correlations for non-normal variables; these were assessed as negligible if less than or equal to ±0.100, weak if less than ±0.300, moderate if less than ±0.700 and strong if greater than ±0.700 (Sijtsma and van der Ark, 2017).

The unidimensionality (Palese et al., 2021) of the UNCS4S section A (unfinished interventions) was first investigated with a Mokken scale analysis at the country level (Sijtsma and van der Ark, 2017) using the

Rho coefficient. Values >0.7 were considered acceptable and those not reaching this value were removed. The goodness-of-fit of the model was assessed by computing Loevinger's H-coefficient (scalability); the scale was considered weak if $0.3 \leq H < 0.4$, moderate if $0.4 \leq H < 0.5$ and strong if $H > 0.5$. The invariant item ordering was then assessed using HT. Similarly to H, invariant item ordering was considered weak if $0.3 \leq HT < 0.4$, moderate if $0.4 \leq HT < 0.5$ and strong if $HT > 0.5$ (Supplementary Tables 3, 4 and 5). The results of the Mokken scale analysis at the country level suggest reducing the number of items in section A, including 22 items for Italian, 16 for Slovakian and 20 for Turkish students. Therefore, average scores (CI95 %) for each item and that of the total score were calculated at the country level considering the whole dataset, thus all items. The Mokken scale analysis findings were then compared to detect the order in the unfinished care interventions as perceived by students. In this analysis, only those items retained were considered in each country.

Data collected with the section B (unfinished care reasons) was subjected to a confirmatory factor analysis by applying the findings of the previous validation conducted in Italy (Palese et al., 2021). The Comparative Fit Index, the Tucker–Lewis Index and the root mean square error of approximation were assessed. All these measures showed good indexes (Supplementary Figures 1, 2 and 3). Therefore, averages and CI95 % were calculated to describe and compare reasons across countries at the item, factor and total scores levels.

3.6. Ethical considerations

The research protocol was approved by the Institutional Review Board of the Department of Medicine of Udine, Italy (RIF Prot IRB 20/2023, Tit III cl. 13 fasc.5/2023). Potential participants were informed of the study's aims, the voluntary nature of their participation, their freedom to withdraw from the research process at any time and the study's contribution to the advancement of the science. Then, they were asked to sign the informed consent. No rewards were offered to stimulate participation apart from the possibility of filling in the questionnaire during the clinical rotation, which was thus counted as learning time. Moreover, data were collected in a centralized manner, protecting students from any pressure at the local level. Reminders to fill in the survey were offered weekly via email, given the different timeframes of the rotations. Units attended by students were informed about the study's aims.

4. Results

4.1. Participants

A total of 1850 students participated (Table 1) with different participation rates among those eligible, specifically 78.2 % in Italy, 64.2 % in Slovakia and 40.0 % in Türkiye.

Students' average age ranged from 21.1 years (Türkiye) to 23.5 (Italy) (p<0.001); most were female (from 81.3 % in Türkiye to 96.1 % in Slovakia) with significant differences across countries (p<0.001). The prevalent civil status was single (from 88.9 % in Italy to 99.6 % in Türkiye, p<0.001) and nearly all were without children (from 94.3 % in Slovakia to 99.6 % in Türkiye, p<0.001). While more than half of Italian and Slovakian students had previous working experience (56.3 % and 54.3 %, respectively), only a few students from Türkiye reported having worked before (13.4 %) (p<0.001).

As reported in Table 1, students were attending mainly the first in Italy (39.8 %) and Türkiye (29.3 %) and the second year in Slovakia (52.1 %) (p<0.001); many of them reported to have attended previous clinical rotations, mainly in hospitals (from 41.2 % in Italy to 62.9 % in Türkiye, p<0.001). The clinical rotation patterns followed by students were also significantly different (p<0.001), with Italian students mainly attending their clinical rotation on 24/24 shifts, weekends included (52.3 %), Slovakia and Türkiye students on 12/24 shifts, weekends

Table 1

Main characteristics of participants.

Variables	Italy n=352	Slovakia n=737	Türkiye n=761	p-value
Age, average (CI 95 %)	23.5 (22.7; 24.1)	22.1 (21.8; 22.4)	21.1 (21.0; 21.3)	<0.001
Female, n (%)	299 (84.9)	708 (96.1)	619 (81.3)	<0.001
Civil Status, n (%)				
Single	313 (88.9)	685 (92.9)	758 (99.6)	<0.001
Married	15 (4.3)	49 (6.8)	3 (0.4)	
Divorced	7 (2.0)	2 (0.2)	0 (0.0)	
Co-habitant	17 (4.8)	1 (0.1)	0 (0.0)	
Without children, n (%)	335 (95.2)	695 (94.3)	758 (99.6)	<0.001
Previous Work Experience, n (%)	198 (56.3)	400 (54.3)	102 (13.4)	<0.001
Academic year attended, n (%)				
I	140 (39.8)	40 (5.4)	223 (29.3)	<0.001
II	104 (29.5)	384 (52.1)	169 (22.2)	
III	108 (30.7)	313 (42.5)	151 (19.8)	
IV	0 (0.0)	0 (0.0)	218 (28.7)	
Previous clinical rotation experiences, n (%)				
Only in Hospital settings	145 (41.2)	423 (56.1)	479 (62.9)	<0.001
Only in community settings	9 (2.6)	14 (2.2)	75 (9.9)	
In Hospital/community settings	91 (25.8)	279 (39.1)	114 (15.0)	
This is my first experience	107 (30.4)	15 (1.9)	92 (12.1)	
Missed data	0 (0.0)	6 (0.7)	1 (0.1)	
Shift, n (%)				
24/24, weekends excluded	55 (15.6)	13 (1.8)	10 (1.3)	<0.001
12/24, weekends excluded	78 (22.2)	576 (78.2)	564 (74.1)	
24/24, weekends included	184 (52.3)	19 (2.6)	99 (13.0)	
12/24, weekends included	35 (9.9)	104 (14.1)	81 (10.7)	
Missing data	0 (0.0)	25 (3.3)	7 (0.9)	
Clinical training hours/ on a weekly basis, average (CI 95 %)	34.0 (33.6; 34.5)	22.8 (21.7; 23.9)	13.2 (12.7; 13.7)	<0.001
Patients cared for in the last training shift at the unit level, average (CI 95 %)	25.2 (23.4; 27.0)	16.7 (16.1; 17.3)	19.1 (18.0; 20.2)	<0.001
Patients cared for (by you, as a student) in the last training shift, average (CI 95 %)	11.7 (10.7; 12.8)	9.9 (9.3; 10.4)	6.9 (6.3; 7.4)	<0.001
Patients newly admitted in the last shift of clinical training, average (CI 95 %)	3.1 (1.8; 4.4)	2.7 (2.5; 2.9)	8.6 (7.5; 9.8)	<0.001
Nurses available at the unit level in the last training shift, average (CI 95 %)	3.8 (3.3; 4.2)	3.7 (3.5; 3.9)	5.1 (4.8; 5.4)	<0.001
Nursing aides available at the unit level in the last training shift, average (CI 95 %)	3.1 (2.6; 3.5)	1.8 (1.7; 1.9)	3.6 (3.3; 3.8)	<0.001
Physicians available at the unit level in the last training shift, average (CI 95 %)	2.8 (2.2; 3.3)	3.5 (3.4; 3.7)	2.9 (2.7; 3.0)	<0.001
Other health care professionals available in the last training shift, average (CI 95 %)	1.6 (1.5; 1.6)	3.3 (3.0; 3.6)	1.7 (1.6; 1.7)	<0.001
Does the unit have an adequate number of nurses in the last training shift?				
Always (100 % of the time)	172 (48.9)	95 (12.9)	94 (12.4)	<0.001
Almost always (75 % of the time)	142 (40.3)	206 (28.0)	275 (36.1)	
Half of the time (50 % of the time)	30 (8.5)	248 (33.6)	264 (34.7)	
Hardly ever (25 % of the time)	6 (1.7)	130 (17.6)	96 (12.6)	
Never (0 % of the time)	2 (0.6)	48 (6.5)	28 (3.7)	
Missed data	0 (0.0)	10 (1.4)	4 (0.5)	
Tutorial model in the of the last clinical rotation. I was supervised by a				
Clinical Nurse	60 (17.1)	108 (14.6)	369 (48.5)	<0.001
Nurse manager	7 (2.0)	323 (43.9)	68 (8.9)	
Clinical nurse appointed as a supervisor	280 (79.5)	80 (10.9)	260 (34.2)	
The nursing staff	4 (1.1)	7 (0.9)	56 (7.4)	
Another Health Care Professionals (not by a nurse)	1 (0.3)	0 (0.0)	7 (0.9)	
A Teacher of the Faculty	0 (0.0)	200 (27.1)	1 (0.1)	
Missed data	0 (0.0)	19 (2.6)	0 (0.0)	
Has this clinical rotation allowed you to achieve the expected learning outcomes?, n (%)				
Not at all	1 (0.3)	81 (11.0)	100 (13.2)	<0.001
Enough	102 (29.0)	321 (43.6)	427 (56.1)	
Greatly	192 (54.5)	244 (33.1)	170 (22.3)	
Very Greatly	57 (16.2)	88 (11.9)	63 (8.3)	
Missed data	0 (0.0)	3 (0.4)	1 (0.1)	

%, percentage; CI, Confidence Interval; n, number.

excluded (78.2 % and 74.1 %, respectively). Also, the average number of hours spent in the clinical settings were statistically different (p<0.001), with around 34/week for Italian, 23/week for Slovakian and 13/week for Turkish students.

According to the students, in the last shift, there were, on average, from around 17 (Slovakia) to 25 (Italy) patients in the unit (p<0.001) and they were cared for by the student for an average of 6.9 (Türkiye) to 11.7 (Italy) hours (p<0.001). The team was composed, on average, from around 4 (Slovakia) to 5 nurses (Türkiye) (p<0.001), with a variable number of other health care professionals as reported in Table 1, in all cases statistically different (p<0.001). Overall, nearly half of the students in Italy reported that the number of nurses available in the unit in the last training shift was adequate (48.9 %). In comparison, Slovakian and Turkish students reported adequacy from half of the time (33.6 %)

to almost all of the time (36.1 %), respectively (p<0.001).

Students were supervised mainly by clinical nurses appointed as supervisors in Italy (79.5 %), clinical nurses in Türkiye (48.5 %) and nurse managers in Slovakia (43.9 %). The achievement of the expected learning outcomes was mostly great among Italian students (54.5 %) and mainly adequate among Slovakian (43.6 %) and Turkish (56.1 %) students (p<0.001).

4.2. Unfinished nursing care scores and order of interventions

At the UNCS4S overall level (Supplementary Table 6), for section A, Italian nursing students reported an average unfinished nursing care score of 50.9 out of 110 (CI95 % 47.6–54.1), Slovakian students 54.9 (CI95 % 53.7–56.1) and Turkish students 50.4 (CI95 % 49.2–51.5)

(p<0.001). On average, in all items, a statistically significant difference was detected across countries (p<0.001). However, the three most frequent unfinished interventions were rated as follows:

- among Italian students: 'Supervising the task assigned to the nursing aides' (i.e., as those health care workers with limited education and working under the responsibility of the nurses), 'Going to patient without being called' and 'Spending time with patients and their caregivers'.
- among Slovakian students: 'Spending time with patients and their caregivers', 'Supervising the tasks assigned to nursing aides' and 'Emotionally supporting patients and their caregivers'.
- among Turkish students: 'Spending time with patients and their caregivers', 'Supervising nursing aides' and 'Emotionally supporting patients and their caregivers'.

On a Likert scale from 1 (never unfinished) to 5 (always unfinished), no items were rated on average below 2 out of 5 by Italian students. Differently, Slovakian students on average rated one item below 2 (performing bedside glucose monitoring as prescribed [1.87, CI95 % 1.78–1.96]) and one higher than 3 (spending time with patients [3.18 CI95 % 3.10–3.25]). Among Turkish students, six items reported an average below 2 (recording vital signs, preventing risks and falls) and one above 3 (spending time with patient and caregivers [3.19, CI95 % 3.11–3.27]).

In the Mokken scale analysis (Table 2), the total item H was 0.739 (SE 0.021) among Italian students, 0.463 (SE 0.016) among Slovakian students and 0.414 (0.019) among Turkish students. Concerning the order, among Italian nursing students, the least often unfinished interventions were performing clinical handover, recording vital signs and performing bedside glucose monitoring, while the most often unfinished were supervising tasks assigned to nursing aides, going to patients without being called and emotionally supporting patients/caregivers.

Among Slovakian students, the three least frequently unfinished tasks, respectively, were performing monitoring at the bedside, recording vital signs and proving hygiene, while the three most often unfinished interventions were going to the patient without being called, communicating with patients and monitoring pain as planned, respectively. Among Turkish students, spending time with patients, emotionally supporting patients/caregivers and helping patients with dysphagia to eat were the least often unfinished interventions, whereas recording vital signs, performing the clinical handover and documenting interventions were the first three unfinished interventions.

The intra-country bivariate analysis identified significant differences statistically in the unfinished nursing care total scores (Supplementary Table 7) across categorical variables: three among Italian and Slovakian students and five among Turkish students. Overall, the perceived adequacy of the nursing staff available at the unit level shows intra-country statistical differences. No significant correlations emerged in the Italian sample in the bivariate analysis with unfinished nursing care total scores and continuing variables. At the same time, the empirical evidence shows two significant correlations in the Slovakian and three in the Turkish samples. All the identified relationships were weak (Supplementary Table 8).

4.3. Unfinished nursing care reasons

As reported in Table 3, Italian nursing students reported an overall score for UNCS4S reasons of 45.92 out of 90 (CI95 % 43.91–47.9); Slovakian students presented an average value of 62 (CI95 % 61.02–62.98); and Turkish of 72.29 (CI95 % 71.13–73.45) (p<0.001). At the factor level, differences emerged across countries (p<0.001), with communication issues (12.57 in Italy, 19.78 in Slovakia, 15.89 in Türkiye) as the first reason for unfinished care, followed by the lack of the material resources availability (7.70, 12.33 and 10.66, respectively) and by the issues in nursing aides' supervision (7.16, 11.83 and 10.15,

Table 2
Mokken Scale analysis comparison across Countries and order of nursing intervention left unfinished.

Nursing interventions	Italy			Slovakia			Türkiye		
	Item H	SE	Order *	Item H	SE	Order *	Item H	SE	Order *
Go to patients without being called	0.614	(0.042)	2	0.320	(0.025)	1	0.324	(0.029)	5
Supervise the tasks assigned to the nurse aides	0.448	(0.052)	1						
Spend time with patients and their caregivers	0.716	(0.031)	4				0.370	(0.025)	1
Assess the effectiveness of the care provided, e.g. reviewing if nursing care needs have been met	0.764	(0.023)	5				0.437	(0.024)	7
Emotionally support patients and their caregivers	0.771	(0.023)	3				0.442	(0.023)	2
Communicate with patients and caregivers	0.740	(0.028)	6	0.421	(0.024)	2	0.416	(0.025)	11
Teach patients and caregivers how to self-care at home	0.681	(0.034)	12	0.401	(0.024)	5	0.435	(0.023)	6
Inform patients and their caregivers about nursing care they are receiving	0.733	(0.027)	8	0.438	(0.022)	4	0.476	(0.022)	8
Ensure clinical teaching of nursing students	0.726	(0.029)	9				0.382	(0.026)	12
Monitor the effects of administered medications	0.792	(0.020)	7	0.441	(0.023)	9	0.440	(0.024)	15
Document properly the interventions provided and the revision of the care plan	0.765	(0.024)	14	0.452	(0.022)	8	0.391	(0.027)	18
Prevent negative outcomes for patients at risk (e.g. falls, pressure ulcers, malnutrition)	0.788	(0.021)	10	0.514	(0.019)	10	0.431	(0.025)	17
Help dependent and/or with dysphagia patients to eat	0.739	(0.028)	18	0.503	(0.021)	11	0.415	(0.023)	3
Help dependent and/or with dysphagia patients to drink	0.777	(0.024)	16	0.500	(0.021)	7	0.422	(0.022)	4
Administer PRN* medications within 15 min of the patient's request	0.748	(0.025)	13				0.366	(0.026)	9
Prevent healthcare associated infections by adopting good clinical practice (e. g. hand hygiene between patients, closed urinary drainage system)	0.767	(0.025)	15	0.450	(0.022)	6	0.444	(0.025)	16
Check pressure ulcers and change dressing according to protocols	0.746	(0.027)	11	0.506	(0.021)	12	0.448	(0.022)	14
Monitor pain as planned	0.780	(0.024)	19	0.371	(0.024)	3	0.464	(0.023)	13
Perform clinical handover to adequately inform the next shift nursing team about patients' conditions	0.763	(0.027)	22	0.484	(0.024)	13	0.354	(0.029)	19
Provide personal hygiene to patients who need it	0.730	(0.029)	17	0.535	(0.021)	14	0.456	(0.021)	10
Record vital signs as planned	0.814	(0.020)	21	0.552	(0.020)	15	0.336	(0.031)	20
Perform bedside glucose monitoring as prescribed	0.788	(0.026)	20	0.484	(0.023)	16			
Total	0.739	(0.021)		0.463	(0.016)		0.414	(0.019)	

H, scalability index; SE, Standard Error.

* Order in which interventions are unfinished: the progressive number indicate the order in which they are unfinished, with high numbers, the more likely it is that the intervention is left as first.

Table 3

Reasons of unfinished nursing care as perceived by students: comparison across countries.

Factors (score ranges)	Item§	Italy n=352	Slovakia n=737	Türkiye n=761	p-value
Factor 1: Communication (5−25)	Tension/conflicts within the nursing staff	2.50 (2.33; 2.66)	3.73 (3.64; 3.82)	2.94 (2.84; 3.03)	<0.001
	Incomplete or interrupted communication among nursing staff	2.58 (2.43; 2.72)	3.93 (3.85; 4.02)	3.26 (3.18; 3.35)	<0.001
	Tension/conflicts between nursing and medical staff	2.44 (2.28; 2.6)	3.95 (3.87; 4.04)	3.19 (3.1; 3.29)	<0.001
	Incomplete/interrupted communication between nursing and medical staff	2.67 (2.53; 2.82)	4.07 (3.99; 4.15)	3.29 (3.2; 3.37)	<0.001
	Lack of support/collaboration among team members	2.39 (2.24; 2.53)	4.10 (4.02; 4.18)	3.19 (3.11; 3.27)	<0.001
	Total score, average (CI95 %)	**12.57 (11.95; 13.2)**	**19.78 (19.4; 20.15)**	**15.89 (15.53; 16.25)**	**<0.001**
Factor 2: Priority setting (3−15)	Inadequate nursing care model (e.g. tasks-oriented model of care)	2.42 (2.27; 2.57)	4.01 (3.93; 4.09)	3.17 (3.09; 3.24)	<0.001
	Inaccurate initial priority setting	2.29 (2.14; 2.44)	3.95 (3.87; 4.03)	3.19 (3.11; 3.27)	<0.001
	Inadequate priority reassessment during the shift	2.30 (2.14; 2.45)	3.84 (3.77; 3.92)	3.19 (3.11; 3.27)	<0.001
	Total score, average (CI95 %)	**7.01 (6.6; 7.42)**	**11.80 (11.58; 12.02)**	**9.55 (9.35; 9.75)**	**<0.001**
Factor 3: Nurses' aides' supervision (3−15)	Nurse aides missed or delayed the reporting of the tasks left undone	2.33 (2.18; 2.48)	3.95 (3.87; 4.03)	3.49 (3.41; 3.57)	<0.001
	Inadequate supervision of the tasks assigned to the nurse aides	2.40 (2.24; 2.55)	3.85 (3.77; 3.94)	3.32 (3.24; 3.4)	<0.001
	Incomplete or interrupted communication between nursing staff and nurse aides/assistive personnel	2.43 (2.28; 2.58)	4.01 (3.93; 4.09)	3.34 (3.26; 3.42)	<0.001
	Total score, average (CI95 %)	**7.16 (6.74; 7.57)**	**11.83 (11.6; 12.05)**	**10.15 (9.95; 10.35)**	**<0.001**
Factor 4: Material Resources (3−15)	Medications prescribed not available	2.48 (2.34; 2.62)	4.17 (4.09; 4.25)	3.51 (3.41; 3.61)	<0.001
	Equipment not available/not functioning properly when needed	2.44 (2.29; 2.59)	4.15 (4.07; 4.23)	3.72 (3.63; 3.81)	<0.001
	Other departments did not provide the service expected (e.g. delay in diagnostic processes)	2.58 (2.44; 2.72)	4.01 (3.94; 4.09)	3.44 (3.35; 3.52)	<0.001
	Total score, average (CI95 %)	**7.50 (7.13; 7.88)**	**12.33 (12.12; 12.54)**	**10.66 (10.43; 10.9)**	**<0.001**
Factor 5: Human Resources (2−10)	Inadequate number of nurses	3.05 (2.92; 3.19)	4.23 (4.15; 4.3)	4.32 (4.25; 4.39)	<0.001
	Inadequate number of staff support	2.98 (2.84; 3.12)	4.15 (4.08; 4.22)	4.11 (4.03; 4.19)	<0.001
	Total score, average (CI95 %)	**6.03 (5.77; 6.29)**	**8.38 (8.24; 8.52)**	**8.42 (8.28; 8.56)**	**<0.001**
Factor 6: Workflow predictability (2−10)	Unexpected increase in the number of patients in critical conditions	2.8 (2.66; 2.95)	4.13 (4.06; 4.21)	3.70 (3.62; 3.79)	<0.001
	High number of hospitalisations/discharges during the shift	2.85 (2.7; 2.99)	3.99 (3.91; 4.07)	3.54 (3.45; 3.62)	<0.001
	Total score, average (CI95 %)	**5.65 (5.39; 5.91)**	**8.12 (7.98; 8.27)**	**7.24 (7.09; 7.39)**	**<0.001**
(18−90)	**Total score UNCS4S, average (CI95 %)**	**45.92 (43.91; 47.93)**	**62.00 (61.02; 62.98)**	**72.29 (71.13; 73.45)**	**<0.001**

CI, Confidence Interval; UNC, Unfinished Nursing Care; UNCS4S, Unfinished Nursing Care Survey for Students.

Item Score: from 1 (not a significant reason) to 5 (very significant reason).

Total UNC4S score: 18–90.

respectively). Also, at the item level statistical differences emerged across countries (p<0.001), with the most significant reason in all being an inadequate number of nurses (3.05, 4.23 and 4.32 out of 5, respectively).

In the bivariate analysis, two (Italian and Slovakian) or three (Türkiye) categorical variables reported significant differences in the UNCS4S reasons total scores at the intra-country level (Supplementary Table 9). Although statistically significant, weak correlations emerged between the total scores for UNCS4S reasons and the continuous variables (Supplementary Table 10).

5. Discussion

5.1. Participants

To the best of our knowledge, this is the first international study involving students and universities/campuses to measure perceptions of unfinished nursing care occurrence among nursing students and the reasons for it. Previous studies were monocentric and mainly qualitative in their design (Palese et al., 2023a). Those involved were young students, largely female and living alone, with some working experience in Italy and Slovakia and little in Türkiye, as previously documented (e.g., Axelsson et al., 2019; Vierula et al., 2021). Despite the reference of common Directives (Dursun Ergezen, Akcan and Kol, 2022; European Union, 2024), nursing education patterns still lack in its harmonization across Europe.

The clinical rotations were different in the number of hours per week (from an overage of 13 up to 34), in their inclusion (or not) of night shifts and weekends, in the number of patients cared for, in the

multidisciplinary nature of the team and in the supervision models. As a result, the clinical rotations seem very intensive among Italian students, as previously reported (Primavera and Leonelli, 2020; Visintini et al., 2023) and less in the other two countries. Moreover, all students were exposed to a high number of patients, thus early adapting themselves to the profession challenges (e.g., European Federation of Nurses Association, 2023; Irish Nurses and Midwives Organisation, 2023). As a result, most of the participants in Slovakia and Türkiye reported the lack of adequacy of nursing care resources at the bedside and less so in Italy, suggesting that students learn how to deal with understaffing issues early in their nursing career. Differences also emerged in students' perceived achievement of the expected learning outcomes, which was considered great among Italian students and less so by others, seeming to indicate that high pressure clinical rotations (e.g. hours/week, 24/24, number of patients) may increase the perception of learning, leaving those under less pressure, attending shift only during the day, less satisfied about the learning outcomes achieved.

5.2. Unfinished nursing care scores and order of interventions

Italian and Turkish nursing students reported lower averages in the total unfinished nursing care scores (around 50 out of 110), suggesting that care activities are unfinished rarely or sometimes. In contrast, Slovakian students reported higher scores, close to care activities being unfinished sometimes or often. Data are in line with previous studies involving nursing students for the Italian sample (Palese et al., 2021) and with studies involving registered nurses for all countries (e.g., Dursun Ergezen et al., 2023; Gurková et al., 2020; Kalánková et al., 2020; Kalánková et al., 2022; Taskiran et al., 2022). Therefore, at the

country level, students seem to report the same occurrence of unfinished nursing care as is reported by nurses, suggesting that they normalize their perceptions early in the nursing career. Moreover, differences across countries suggest that students may have variable awareness regarding the likelihood of the unfinished nursing care phenomenon due to factors such as the number of hours spent in practice every week (from 13.2 to 34 hours), whether or not weekends are included and the number of patients cared for - thus the opportunity to observe the continuum of the quality of care and to be exposed to the process of normalization.

According to the unfinished nursing care averages and order of interventions, interesting patterns emerged. Firstly, overall, across countries, all students seem to perceive some practical interventions as less unfinished (e.g., glucose monitoring, measuring vital signs), leaving unfinished more of those related to the psychological and emotional support of patients/caregivers. The prioritized interventions are linked to medical prescriptions likelihood due to the actual or perceived interdependence between the nurses and the physicians (Palese et al., 2020) or because leaving them unfinished may be considered an omission with legal implications (e.g., Rezaei-Shahsavarloo et al., 2021). However, unlike Italian and Slovakian students, the Turkish sample reported fewer cases of leaving nursing documentation and interventions related to the prevention of risks (e.g., falls) unfinished: this may be due to the priority given to patient safety by the nursing education and health systems and the accreditation processes undertaken by hospitals and education systems where students may be helped to realize the significance of some interventions (HUÇEP, 2022).

Secondly, supervising nursing aides was reported by all students as often being unfinished and practically the first intervention left unfinished. Educators should debate this aspect: in several countries (Fonda, Galazzi and Palese, 2024), nursing aides are playing an essential role by expanding their care activities; thus, the missed supervision may have detrimental implications for students. The fragmentation of care, with nurses on one side and nurses' aides on the other, often due to care models based on division of tasks, may prevent a whole consideration of the patient's needs, with negative implications for students.

Thirdly, time spent with patients, taking care of their emotional issues and those of their caregivers, were ranked among the interventions mostly likely to remain unfinished, with higher averages, as already documented among registered nurses (e.g., Cengia et al., 2022; Dursun Ergezen et al., 2023; Gurková et al., 2020; Kalánková et al., 2020; Kalánková et al., 2022; Taşkıran Eskici and Baykal, 2022). Different prioritization patterns have been documented in the literature, justifying the order of unfinished nursing care. Nurses should ask themselves what should be performed immediately and what tasks can wait, with some activities at high priority (e.g., vital signs), second-level or treatment-related problems (e.g., infection prevention) and at low priority, such as patient documentation (Blackman et al., 2018). However, other authors have underlined different patterns with conflicting expectations among nurses (Suhonen et al., 2018). More recently, a systematic review including studies performed during the pandemic has documented new patterns due to the unprecedented circumstances faced by healthcare systems (Chiappinotto et al., 2023). In the context of different patterns, our study suggests that these are shaped early in the nurse's professional life and may be influenced by the care values hidden in the practice, given that no individual or educational variables have played a role in our data. Reshaping the priorities—for example, putting more emphasis on the emotional needs of patients and providing intense investments not only in theoretical education but also in clinical practice - where these implicit values are put into action influencing students' minds - may be relevant to prevent the risk of replicating the established patterns in the future.

While no statistical differences in the total unfinished nursing care scores at the intra-country level emerged for individual variables (e.g., age), with the exclusion of previous work experience, some differences emerged in nursing education variables, suggesting that these should be

considered in future studies as probable factors shaping unfinished nursing care perceptions at the country level. However, in all countries, the perceived adequacy of nursing staff has influenced the amount of unfinished nursing care reported. Students may not have the objective criteria to understand if the resources available are sufficient; however, they may have reported clinical nurses' perceptions heard in clinical practice, or they may have been involved in the care of patients as workers and not in a supernumerary role as a learner. In all cases, early discovery that nurses live in a chronic shortage may prevent students from imagining a nursing profession capable of delivering the care required to all patients.

Not lastly, higher perception of unfinished nursing care is associated with perceived lower achievement of learning outcomes. Therefore, the occurrence of unfinished nursing care may have detrimental effects on the nursing competencies achieved and this should be considered with care, given that it may limit the competences acquired as a whole.

5.3. Unfinished nursing care reasons

Two interesting findings emerged regarding the reasons. First, students from Türkiye reported high scores in section B of the tool (around 72 on average), suggesting that the reasons assessed by the UNCS4S were significant for them in causing the unfinished care perceived. The overall score of Italian students (around 45) was below that of Slovakian students (62), suggesting that they perceived the reasons as less important. What has emerged may express the different roles across countries of the overall factors triggering the unfinished nursing care according to the characteristics of the clinical environment experienced, as shaped by the national legislation and policies. However, despite these differences, students perceived communication, the lack of material resources and issues in supervision of nursing aides as significant in all countries. Communication breakdowns, insufficient material resources and inadequate supervision of nursing aides may be universal challenges across healthcare systems regardless of the country. These issues can arise due to systemic factors such as staffing shortages, budget constraints and organizational inefficiencies, common in all countries. However, these are fundamental components of delivering quality nursing care. Communication is of undeniable importance in ensuring continuity of care (Cordeiro et al., 2020), as is the availability of adequate equipment and resources (Jones, Hamilton and Murry, 2015). Moreover, care is a structure that should include experts from different disciplines and the patient being cared for, rather than being a phenomenon provided by the nurse alone. Since their internship, students should be able to learn the importance of working in a team (Kohanová et al., 2024b) and that this collaboration can lead to better outcomes in care, decreasing the phenomenon of unfinished nursing care (Schubert et al., 2021). When these elements are lacking, the ability of nurses/nursing students to carry out their responsibilities effectively can be impeded, leading to unfinished care tasks. Moreover, poor communication, inadequate resources and lack of supervision can have a direct impact on patient outcomes and safety. Nursing students may be unable to provide timely interventions, administer medications, or carry out essential procedures supervised by their clinical tutors, resulting in compromised patient care. This is most frequently seen in clinical practice by nursing students, as already reported (Dziurka et al., 2022; Machul et al., 2022). Furthermore, nursing education programs often emphasize the importance of communication skills, resource management and teamwork. As such, students may be particularly attuned to these factors and recognize their significance in ensuring optimal patient care, as seen during the clinical placements.

While healthcare systems may differ across countries, specific challenges like communication and resource availability might transcend cultural boundaries. Students from diverse backgrounds may identify similar issues based on their experiences and observations in healthcare settings. Additionally, students may perceive communication, resource management and supervision as critical areas for professional

development and improvement in nursing. Recognizing these challenges during their education can prepare them to address similar issues in their future practice (Aase et al., 2014; Kim and Kim, 2023).

6. Limitations

This study has several limitations. Firstly, under the methodological point of view, we adopted a pragmatic approach, including universities of different sizes, with different educational pathways (e.g., the number of hours expected in clinical rotations) and without establishing the sample size a priori: all these factors may have affected the findings. Secondly, in line with previous investigations (e.g., Palese et al., 2021), students involved were at the end of their clinical placement before receiving the evaluation of the competencies achieved, to prevent possible influences. However, they were invited to fill in online or paper/pencil questionnaires, which may have also influenced the findings. Thirdly, we used the same validated tool in all countries, although it originated in Italy (Palese et al., 2021): specifically, the tool was based on self-perception measures and the individual expectations of students regarding, for example, the amount of time to spend with patients may have influenced the degree of perceived unfinished nursing care. Fourth, the H indexes in the Mokken scale analysis among the Italian (>0.700) compared with Slovakian (0.463) and Turkish (0.414) students alongside the need to remove some items (six and two, respectively), suggests the need to validate the tool further. Fifth, we involved a substantially homogeneous profile of students attending nursing programs which had significant differences in duration and structure, especially in clinical learning pathways, reflecting differences in the healthcare systems. These variations suggest that studies at the multinational level are recommended to assess the contribution of different variables (e.g., number of hours spent in practice) to both experience and education outcomes. Finally, the data were collected between 2022 and 2023, when the pandemic had just ended and healthcare facilities were returning to normality; therefore, students' unfinished nursing care perception may have been influenced (Palese et al., 2023b).

7. Conclusions

This is the first international study on unfinished care as perceived by nursing students in three countries with different educational structures, care cultures and healthcare systems. Students are aware that unfinished care occurs in practice, as measured by the UNCS4S where higher scores have been reported among Slovakians, while Italian and Turkish students shown similar scores. The unfinished interventions at high or low occurrence are mostly similar across countries, suggesting that the emphasis given during education to some specific factors (e.g., documentation, risks) are mostly similar. Therefore, students learn to shape and set priorities early in their nursing career.

Reasons for unfinished nursing care also show significant differences across countries, with high UNCS4S scores among Turkish students ranking lower among Slovakian and overall low among Italian students. However, factors mostly influencing unfinished care were similar across countries, with communication issues, lack of materials available and lack of supervision of nursing aides as significant contributors. In all countries, students are trained early to cope with communication issues and the lack of nursing and material resources. How to better prepare students to be resilient and capable of managing the challenges posed by unfinished nursing care episodes due to the lack of resources and communications issues should be considered as a priority by nurse educators. The pressure imposed to students by the may increase their intention to leave the programme or to compromise their acquired competences.

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CRediT authorship contribution statement

Alvisa Palese: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Luca Grassetti:** Writing – original draft, Visualization, Validation, Software, Methodology, Formal analysis, Data curation. **Aysel Özsaban:** Validation, Investigation, Data curation. **Aysun Bayram:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Stefania Chiappinotto:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Project administration, Methodology, Investigation, Formal analysis, Data curation. **Tommaso Lupi:** Writing – original draft, Visualization, Data curation. **Dominika Kohanová:** Validation, Funding acquisition, Data curation. **Öznur İspir Demir:** Validation, Investigation, Data curation. **Elena Gurková:** Validation, Investigation, Data curation. **Seher Basaran-Acil:** Validation, Investigation.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.nepr.2024.104100.

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