RESEARCH ARTICLE

Nursing students' competence profiles in gerontological nursing—A cross-sectional study

Anniina Tohmola[1,2] | Satu Elo[2] | Kristina Mikkonen[1] | Helvi Kyngäs[3] | Sinikka Lotvonen[4] | Reetta Saarnio[5]

[1]Research Unit of Nursing Science and Health Management, University of Oulu, Oulu, Finland

[2]Lapland UAS, Kemi, Finland

[3]Research Unit of Nursing Science and Health Management, University of Oulu, Oulu University Hospital, Oulu, Finland

[4]Research Unit of Nursing Science and Health Management, GeroNursingCentre, University of Oulu, Oulu, Finland

[5]Oulu UAS, Oulu, Finland

Correspondence
Anniina Tohmola, Research Unit of Nursing Science and Health Management, University of Oulu, Oulu, Finland.
Email: anniina.tohmola@gmail.com

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Abstract

Aim: The study aimed to describe and explain the self-assessed gerontological nursing competence levels of Finnish nursing students and factors relating to it.

Design: A cross-sectional study design, reported by The Strengthening the Reporting of Observational studies in Epidemiology guidelines.

Methods: Data were collected with the GeroNursingCom instrument, which features 53 items relating to 11 competence factors. The K-clustering technique and the Chi-squared, Kruskal-Wallis and Mann Whitney tests were used to analyse the data.

Results: Seven hundred and ninety-nine nursing students from nine randomly selected higher education institutions were invited to participate in 2019. Three distinct student profiles were identified according to the data (N = 274): Profile A—lower intermediate competence (23.1% of students), Profile B—intermediate competence (45.8%) and Profile C—high competence (31.1%). The strongest competence area for all students was appreciative encounter and interaction, and the weakest was supporting the older person's sexuality. Nursing students have diverse backgrounds and their overall competence in gerontological nursing is shaped in part by their previous education, motivations and work experience.

Relevance to clinical practice: Recognizing students' different gerontological nursing competence profiles enables the implementation of targeted education to improve competence in clinical practice.

KEYWORDS
competence profiles, gerontologic nursing, gerontological nursing, nursing competence, nursing students, older people, older people nursing, quantitative research

1 | INTRODUCTION

Older people constitute a large proportion of the population in general and of healthcare clients in particular, and the proportion of older people in both groups is expected to increase in the future (WHO, 2018). Growing numbers of skilled nursing staff will,

therefore, be needed to meet the future demand for gerontological nursing care (United Nations, Department of Economic and Social Affairs, Population Division, 2017). Nurses are trained in higher education institutions (Amini et al., 2016; Råholm et al., 2010) all over the world at an average annual rate of average 46 nurses per 100,000 inhabitants in OECD countries (OECD, 2017). Studies in

nursing usually last for 3–4 years, including theoretical and clinical studies (European Commission, 2005; Råholm et al., 2010; WHO, 2020a). In member states of the European Union (EU), the content of nursing education programmes is regulated by an EU Directive (2005/36/EU) that mandates the inclusion of courses on caring for the elders and geriatrics (European Commission, 2005). General competences in nursing are defined by national and international requirements and recommendations (European Federation of Nurses Association, 2015; Fukada, 2018) following the formal qualifications from an EU Directive (2013/55/EU) (European Commission, 2013). Gerontological nursing is defined by the American Nurses Association (ANA) as an evidence-based nursing specialty that focuses on the process of ageing and the protection and promotion of health and functions (Bickford, 2018), both of which require patient- and family-centred care competences (Bahrami et al., 2019). The World Health Organization defines gerontological nursing as the provision of nursing care in various care settings for older people as a member of a multidisciplinary health and social care team (WHO, 2003).

To ensure that graduating nurses possess the necessary levels of gerontological nursing competence, nursing education programmes must prepare future nurses accordingly. Although nursing students have positive (Salin et al., 2020) or moderately positive (Rathnayake et al., 2016) attitudes towards older people, they generally do not see caring for older people as an interesting area of specialization (Hunt et al., 2020). Therefore, students may lack motivation to study and work in this field, making it necessary to increase the attractiveness of gerontological nursing. Because students' willingness to care for older people is limited (Chi et al., 2016; Jang et al., 2018), ways should be devised to improve the willingness of student nurses to specialize in this area and to increase the supply of nurses skilled in gerontological nursing. One way to do this is by adapting current educational programmes because the learning environment is known to strongly influence competence development (Salonen et al., 2007).

This study aimed to describe and explain the self-assessed gerontological nursing competence levels of Finnish nursing students and factors relating to it. Its results give new knowledge that can be used to support students with specific backgrounds in gerontological nursing and to refine current nursing education practices. Raising awareness of gerontological nursing competences and their level among nursing students will ultimately help to improve gerontological nursing practice, benefit the ageing global population and facilitate movement of nurses between countries.

2 | BACKGROUND

Older people, that is people over 65 years old, are a heterogeneous group who generally live independently, travel and manage their own lives (Rogers & Mitzner, 2017). However, as they age, they commonly suffer from increasingly serious health issues (WHO, 2018). Older people receive health care from nurses who offer them guidance, treat illnesses, support their physical or mental health, and administer

> **What does this paper contribute to the wider global clinical community?**
> - Nursing students with previous vocational training have better self-assessed gerontological nursing skills.
> - The analysis gives insight into how gerontological nursing could be improved by developing nursing education.
> - The competence profiles defined here can be used to develop gerontological nursing education programmes that account for nursing students' backgrounds.

medication (Nazarko, 2017) in diverse nursing environments including hospitals, health centres, nursing homes, health clinics and mobile services. Nurses are expected to have various competences and sufficient understanding to meet the multiple needs of older people (Kotila et al., 2020). Nursing higher education institutions play a key role in ensuring that their graduates are competent professionals in holistic gerontological nursing. Nurses should be familiar with the latest recommendations and the studies on which they are based, for example in relation to administering medication (Karttunen et al., 2019) and providing nutritional (WHO, 2020b) and functional (Paterson & Warburton, 2010; WHO, 2020c) guidance to older people. Nurses must also know how to give professional and humane end-of-life care and ensure the safety of living environments for older patients. Positive encounters, communication and interaction should be the foundation of all nurse–patient meetings (Kourkouta & Papathanasiou, 2014), and giving nurses the skills to ensure positive patient encounters should be an underlying objective throughout their education. Because, the elder population is growing, it is essential to promote the health of older people to allow them to live at home for as long as possible.

Maintaining awareness of developments and advances in one's professional field can be challenging, especially whether they are not discussed during one's education. Nursing education should, therefore, incorporate diverse sources of information and perspectives on gerontological nursing, and guide graduating nurses to update their competences in working life (Gardiner & Sheen, 2016; Parker et al., 2014). Moreover, the holistic gerontological nursing competences give possibilities to adapt caring strategies for different patients in different situations. Challenging situations will inevitably be encountered during nursing practice, but enduring such situations is easier when nurses have professional knowledge of gerontological nursing (Frilund et al., 2014). Nursing education should, therefore, give students the multiple tools they need to meet the professional challenges they will face during their nursing career, and to adapt to future changes in health care (Salmond & Echevarria, 2017) such as evolving digitalization and changing working conditions. Despite the potential educational benefits of defining and outlining nursing competence areas, Salonen et al. (2007) state that there has been little research in this area and that contextual evidence-based information about nurses' competence areas is needed. By describing levels

of competence in geriatric care among student nurses, the current study gives new evidence in this area and a new way of seeing students' competences in different settings and backgrounds.

EU directive 2005/36/EC specifies the theoretical and clinical contents of nursing education programmes, but does not define the competence areas that should be addressed or the extent to which they should be covered (European Commission, 2005). However, some European countries require nursing courses to include at least 121.5 hr (4.5 European Credit Transfer and Accumulation System (ECTS) credits) of gerontological nursing studies (Deschodt et al., 2009). Despite these reforms in Europe, more research is needed to establish a globally accepted definition of the needed competences (Kajander-Unkuri et al., 2013). Outside of Europe, the American Association of Colleges of Nursing (AACN) (2010) has defined nine nursing competences and developed curricular guidelines on nursing care for older adults together with a proposal to establish stand-alone courses and integrate gerontological nursing into the whole of the nursing curriculum. Based on legislation, in Finnish nursing education higher education institutions are free to set their own curricula based on applicable legal requirements and published recommendations (University of Applied Sciences Act, 932/2014). Consequently, the scope and extent of gerontological nursing education may differ between such institutions. Students may study on a full-time basis or via blended learning, studying either daily and mostly at school or mainly independently with periodic (sometimes monthly) school attendance (Vanhanen-Nuutinen et al., 2012). The educational institutions participating in this study offered between 108–324 hr of student work (4 &12 ECTS credits) on gerontological nursing theory.

We have previously interviewed gerontological nursing experts, who identified several key competences in gerontological nursing including knowing how to manage clinical nursing, competence in promoting health and well-being, and competence in interaction and ethics (Tohmola et al., 2021a). Bahrami et al. (2019) emphasized that gerontological nursing competences need to focus on patient- and family-centred care, process-oriented care and self-care and continuing professional development. This study evaluates the gerontological nursing competence of Finnish nursing students based on the 11 competence areas defined in our previously validated GeroNursingCom instrument. These competence areas are: appreciative encounter and interaction with older persons (Holopainen et al., 2017), administration of medication to older persons (Karttunen et al., 2019), implementation of nutrition for older persons (Shlisky et al., 2017; WHO, 2003), implementation of a safe living environment for older persons (Nieboer & Cramm, 2018; Portegijs et al., 2017), supporting the functioning of older persons (Heath & Watson, 2006), end-of-life care (Smith, 2003), developing one's competences (Rizany et al., 2018), supporting the mental well-being of older persons (Hupkens et al., 2020), supporting the sexuality of older persons (Haesler et al., 2016), guiding the self-care of older persons (Imaginário et al., 2020) and responding to challenging situations (Suhonen et al., 2018).

3 | METHODS

3.1 | Aim

This study aimed to describe and explain the self-assessed gerontological nursing competence levels of Finnish nursing students and factors relating to it. The following research questions were addressed as follows:

1. How do students' do self-assessed gerontological nursing competence levels cluster into profiles?
2. What factors explain the self-assessed competence gerontological nursing profiles of nursing students?

3.2 | Design

A cross-sectional study design was used covering the whole of Finland.

3.3 | Participants

The participants were Finnish nursing students ($N = 799$; $N = 274$) studying in nine of Finland's 21 universities of applied sciences. The chosen universities are widely spread across the country in geographical terms, which were randomly selected to represent equal distribution and diversity of nursing students. The total number of participants was estimated based on the number of students starting their studies in each semester. Since no previous similar studies have been conducted in the same context, effect sizes were measured using Cohen's d effect size (Cohen, 1992) and were found to be large. Inclusion criteria for participants were attendance at one of the chosen universities of applied sciences as a nursing student and having completed studies on gerontological nursing or equivalent studies under a different name. The contact persons were asked to collect data in accordance with these criteria. Educational institutions have autonomy concerning the organization of their curricula, making it possible that students studying at different institutions would have received different levels of education in gerontological nursing. The response rate among invited participants was 34%.

3.4 | Instrument

The instrument used in this study was the previously validated Gerontological Nursing Competence (GeroNursingCom) instrument (Tohmola et al., 2021b). This instrument was developed for self-assessment of nursing students' levels of competence in gerontological nursing. The instrument contains 53 items representing 11 sum-variables: (a) Appreciative encounter and interaction with older persons (7 items); (b) Administration of medication to older persons (5 items); (c) Implementation of nutrition for older persons (6 items);

(d) Implementation of a safe living environment for older persons (5 items); (e) Supporting the functioning of older persons (9 items); (f) End-of-life care (4 items); (g) Developing one's competences (4 items); (h) Supporting the mental well-being of older persons (4 items); (i) Supporting the sexuality of older persons (3 items); (j) Guiding the self-care of older persons (3 items) and (k) Responding to challenging situations (3 items). Items are scored on continuous Likert scales ranging from 1–4 (1 = complete disagreement, 2 = partial disagreement, 3 = partial agreement, 4 = complete agreement), when the highest total score indicated higher competence. The Cronbach alpha for the factors varied between 0.75–0.89, and that for the whole instrument was 0.96. The questionnaire included 12 background questions relating to demographic variables such as the respondent's year of birth, gender, previous education and work experience, study motivation, type of study and academic success.

3.5 | Data collection

Data were collected using self-administered questionnaire accessed using the Webropol software tool (V3.0) in the spring and autumn semesters of 2019. The questionnaire was sent to a contact person at each participating university of applied sciences by email with a one-week reminder. Five of the nine contact persons invited students to complete the questionnaire during their contact teaching lessons, while the rest invited students by email or using a combination of in-person and email invitations. Students took 15–20 min to complete the questionnaire, answering all questions at once.

3.6 | Ethical considerations

Permission to conduct the study was obtained from each of the nine participating universities of applied sciences. The research was conducted in accordance with ethical regulations (Finnish National Board of Research Integrity, 2012). According to Finnish regulations, since participants were not harmed or exposed to any psychologically or physically harmful influences, the formal approval of an ethical committee was not required (Medical Research Act, 2010/794). The participants received a cover letter through the contact person that described the study and specified that participation was voluntary and that all collected data would be protected. To reduce bias, the researchers never had access to the participants' email addresses or personal information (Polit & Beck, 2011). After reading the cover letter, prospective participants could choose whether to participate in the study.

3.7 | Data analysis

The data were analysed using IBM SPSS (V.25; IBM Corporation, Armonk, NY) software. The presence and nature of missing values in the data were investigated by using the Missing at Random

(MAR), Missing Completely At Random (MCAR), and Missing Not at Random (MNAR) commands, resulting in no detection of missing values. The response of one participant was deleted since the missing values were over 50% of the total response. The respondents' 11 competence areas (in the form of sum-variables) were then clustered using the K-Means Clustering Algorithm, which is a method of clustering response data into defined non-overlapping respondent groups (Rauf et al., 2012). In this study, the clusters were grouped based on the students' self-assessed competence levels with respect to the instrument's 11 sum-variables. After testing up to ten different cluster formation runs applying the common rule that no cluster could comprise less than 5% of the total sample, the optimal cluster configuration was found to consist of three clusters representing three distinct student profiles. The clusters are referred to as profiles henceforth. The profiles were compared using descriptive statistics such as frequencies, percentages and standard deviations.

The dependence between the classified background variables, overall competence and profiles was analysed by the Chi-squared, Kruskal-Wallis and Mann Whitney tests. Differences between observed profiles were considered statistically significant if the corresponding p-values were <.05 (Munro, 2005). When a statistically significant difference was found between the profiles, a Bonferroni correction was applied to assess whether each profile differed significantly from the others. The participating students were assigned to profiles based on their competences, which were defined as low (<2.49), intermediate (2.5–3.49), or high (>3.5) based on their mean GeroNursingCom scores.

3.8 | Validity and reliability

The GeroNursingCom instrument was developed and psychometrically validated via a four-phase procedure as reported previously (Tohmola et al., 2021b). The instrument was face and content validated by nine gerontological nursing experts and by computing its Content Validity Index. After face and content validity testing and instrument modification, the instrument's structural validity was tested by explorative factor analysis, yielding 11 factors. Its internal consistency was evaluated by calculating Cronbach's alpha, which varied from 0.75–0.89. The instrument thus exhibited adequate reliability (DeVon et al., 2007).

4 | RESULTS

4.1 | Demographic characteristics of the participants

In total, 274 nursing students chose to complete the questionnaire, and 273 of their responses were used in the final data analysis. Most (86%) of the students were female. Participants were between 21- and 57 years old, and the mean of their birth years was 1986 (*SD* 46.33). Of the participants, 43% were in their fourth year of nursing

studies and 61% were studying on a full-time basis. Most of the students (44%) had graduated from high school, 32% held a vocational qualification, and the remainder (24%) had previously completed professional training in another area such as media, hairdressing, business or catering. Most of the students (65%) had an experience of nursing work due to previous employment in health care (see Table 1).

4.2 | Gerontological nursing self-assessed competence levels of nursing students and factors relating to it

We identified three student profiles, designated A—lower intermediate competence, B—intermediate competence and C—high competence. In total, 23.1% of the participants fit profile A, 45.8% fit profile B, and 31.1% fit profile C. The mean levels of overall gerontological care competence for each profile were either intermediate or high; the mean GeroNursingCom scores for profiles were (A) 2.72 (SD 0.40), (B) 3.11 (SD 0.40) and (C) 3.63 (SD 0.37) (see Table 2). Additionally, students reported that their average grade in gerontological nursing studies was 3.68 (grades range from 1–5, with 1 being the lowest and 5 the highest). The assessed levels of competence differed significantly between the three profiles ($p < .001$). The strongest competence area for all students was *appreciative encounter and interaction* (Profile A- 3.11; Profile B- 3.50; Profile C- 3.83), and the weakest was *supporting the sexuality of older persons* (Profile A- 2.16; Profile B- 2.42; Profile C: 3.20). As shown in Table 1, the only demographic variable significantly related to the profiles was the students' previous education: over 50% of Profile A and B students had completed a high school education, while over 50% of Profile C students held a vocational qualification.

Profile A students had lower mean scores in all competence areas than profile B and C students. This profile had no high-level competences; instead, the students' competences varied between the intermediate and low levels. There were eight intermediate-level competences (mean scores between 3.11–2.68) and three low-level competences (mean scores between 2.46–2.16). On the other hand, 49% of students had high self-reported grades (between 4–5) in gerontological nursing, and 63% felt that they had received sufficient training in gerontological nursing. Most of these students had little motivation to study gerontological nursing further (64%).

Profile B students had high, intermediate and low competence levels, with scores between 3.50–2.42. Students with this profile had the second highest level of academic success, with most of them (61%) achieving grades of 4 or 5. Over half (53%) of students fitting this profile thought that they had taken enough classes in gerontological care, and 58% reported low motivation to study gerontological nursing further.

Profile C students reported high or intermediate levels of competence in all categories, with scores between 3.83–3.20. These students had mostly (63%) been successful in their studies, obtaining grades of 4 or 5, and almost half (47%) thought that they had taken

sufficient courses in gerontological care. Over half of these students held a vocational qualification, 77% had previous working experience in healthcare sector, and 64% were highly motivated to study gerontological nursing further.

5 | DISCUSSION

We examined the self-assessed gerontological competence levels of Finnish nursing students and identified three distinct student competence profiles based on their self-assessments: A—lower intermediate competence, B—intermediate competence and C—high competence. Most of the participants evaluated their competences as being intermediate or high, but students with profile C reported the highest levels of competence in gerontological nursing. When talking about only previous education had a statistically significant effect on the students' self-assessed competence, while birth year, gender and academic success of the students had no significance.

Experience of working with older people enhances nursing students' knowledge of and ability to work with older people, and positively influences their attitudes towards gerontological nursing, increasing their interest in gerontological nursing (Swanlund & Kujath, 2012). Additionally, students with prior experience of working in health care have some general knowledge of nursing and may have acquired a different perspective on caring for older people. They can, thus, reflect and integrate what they learn while studying gerontological care with their existing knowledge base. They also may have some experience of working with older people, which may strengthen their interest in the field (Koskinen et al., 2012) and positively influence their competencies in gerontological nursing. Previous vocational education also increases students' practical expertise in the field, giving them additional background knowledge to use when developing solutions and increased professional capital resulting from previous encounters with patients (Crevacore et al., 2019). Students with minor working experience or no previous education in health care need greater practical experience to deepen their understanding of the world of older people.

Previous encounters with older patients increase students' competence in caring for older people and understanding their needs (Rejeh et al., 2011). This may reflect the focus of their education in gerontological nursing. Students belonging to profile C, most of whom held vocational qualifications, were the most strongly motivated to study gerontological nursing. This may have been the factor that prompted them to study nursing, either because of interest in the field based on previous experiences or because of confidence in the future demand for their skills. A student who has already met many older people or already knows that he or she will be working in gerontological nursing may have increased motivation to study this field. However, if nursing students have unpleasant experiences during their practical education due to poor standards of care, their attitudes towards gerontological nursing may be adversely affected (Garbrah et al., 2017; Rejeh et al., 2011).

TABLE 1 Students' characteristics reported in profiles (N = 273)

Characteristics	Profile A (N = 63)	Profile B (N = 125)	Profile C (N = 85)	p-Value
Year of birth, mean (SD)				
1986 (7.5)	1989 (7.7)	1990 (7.3)	1988 (7.6)	.369[b]
Gender, N (%)				
Female (of total 85.7%)	51 (81.0)	105 (84.0)	78 (91.8)	.135[a]
Male (of total 14.3%)	12 (19.0)	20 (16.0)	7 (8.20)	
Other	0	0	0	
Education, N (%)				
Vocational qualification (of total 32.2%)	10 (15.9)	34 (27.2)	44 (51.8)	**<.001[a]**
High school (of total 44%)	33 (52.4)	66 (52.8)	21 (24.7)	
Another professional (of total 23.8%)	20 (31.7)	25 (20.0)	20 (23.5)	
Previous work experience in health care, N (%)				
Yes (of total 65.3%)	38 (60.3)	75 (60.0)	65 (76.5)	**.032[a]**
No (of total 34.7%)	25 (39.7)	50 (40.0)	20 (23.5)	
School year, N (%)				
2nd (of total 20.9%)	12 (19.0)	31 (24.8)	14 (16.5)	.211[a]
3rd (of total 35.9%)	19 (30.2)	43 (34.4)	36 (42.4)	
4th (of total 42.5%)	32 (50.8)	51 (40.8)	33 (38.8)	
5th (of total 0.7%)	0 (0)	0 (0)	2 (2.4)	
Study type, N (%)				
Day-studying (of total 60.8%)	44 (69.8)	77 (61.6)	45 (52.9)	.111[a]
Multiform-studying (of total 39.2%)	19 (30.2)	48 (38.4)	40 (47.1)	
Motivation to study gerontological nursing, N (%)				
Very much (of total 8.8%)	1 (1.6)	9 (7.2)	14 (16.5)	.06[a]
A lot (of total 38.8%)	22 (34.9)	44 (35.2)	40 (47.1)	
Little (of total 44.7%)	34 (54.0)	61 (48.8)	27 (31.8)	
Very little (of total 7.7%)	6 (9.5)	11 (8.8)	4 (4.7)	
Enough gerontological nursing classes				
Yes (of total 53.5%)	40 (63)	66 (52.8)	40 (47.1)	.663[a]
Grade, number (%)				
2 (of total 7.0%)	8 (12.7)	5 (4)	6 (7.1)	.363[a]
3 (of total 34.4%)	24 (38.1)	44 (35.2)	26 (30.6)	
4 (of total 42.1%)	22 (34.9)	54 (43.2)	39 (45.9)	
5 (of total 16.5%)	9 (14.3)	22 (17.6)	14 (16.5)	
Orienting studies				
Acute care or equivalent (of total 12.1%)	8 (12.7)	12 (9.6)	13 (15.3)	.328[a]
Gerontological nursing or equivalent (1.5%)	1 (1.6)	3 (2.4)	0 (0.0)	
Nursing of children, young people and families or equivalent (6.6%)	4 (6.3)	9 (7.2)	5 (5.9)	
Mental health and substance abuse nursing or equivalent (21.2%)	12 (19.0)	24 (19.2)	22 (25.9)	
Perioperative nursing or equivalent (11%)	10 (15.9)	15 (12.0)	5 (5.9)	
Internal medicine nursing or equivalent (7%)	3 (4.8)	10 (8.0)	6 (7.1)	
Intensive care nursing or equivalent (11.7%)	5 (7.9)	12 (9.6)	15 (17.6)	
Palliative nursing or equivalent (0.7%)	0 (0.0)	0 (0.0)	2 (2.4)	
Surgical care nursing or equivalent (1.5%)	1 (1.6)	2 (1.6)	1 (1.2)	
Some other, like adult nursing, acute-internal/intensive/perioperative (13%)	19 (30.2)	38 (30.4)	16 (18.8)	
No orienting studies (13.7%)				

Note: p < .05 (marked in bold).

[a]Chi-Squared.

[b]One-way ANOVA.

TABLE 2 Competence areas of nursing students' profiles in gerontological care (N = 273)

	Competence areas, mean value (SD)	Profile A Lower intermediate competence 2.72 (0.40)	Profile B Intermediate competence 3.11 (0.40)	Profile C High competence 3.63 (0.37)	p-Value
1.	Competence in appreciative encounter and interaction with older person	3.11 (0.35)	3.50 (0.31)	3.83 (0.20)	<.001
2.	Competence in developing one's competencies	3.00 (0.41)	3.40 (0.41)	3.77 (0.30)	<.001
3.	Competence in supporting the functioning of the older person	2.91 (0.26)	3.26 (0.32)	3.73 (0.25)	<.001
4.	Competence in supporting the well-being of the older person's mind	2.85 (0.39)	3.23 (0.41)	3.83 (0.29)	<.001
5.	Competence in responding to challenging situations	2.84 (0.38)	3.25 (0.40)	3.78 (0.36)	<.001
6.	Competence in implementation of a safe living environment for the older person	2.82 (0.43)	3.19 (0.39)	3.76 (0.35)	<.001
7.	Competence in implementation of nutrition for the older person	2.72 (0.34)	3.21 (0.36)	3.72 (0.36)	<.001
8.	Competence in implementation of medication for the older person	2.68 (0.36)	3.15 (0.36)	3.73 (0.34)	<.001
9.	Competence in end-of-life care	2.46 (0.58)	2.93 (0.54)	3.40 (0.57)	<.001
10.	Competence in guiding the self-care of the older person	2.37 (0.51)	2.77 (0.41)	3.28 (0.57)	<.001
11.	Competence in supporting the sexuality of the older person	2.16 (0.44)	2.42 (0.51)	3.20 (0.54)	<.001

Note: Likert scale 1–4 (1 – Completely disagree; 2 – Partially disagree; 3 – Partially agree; 4 – Completely agree). Profiles range explained by competence in low level <2.49, intermediate level 2.50–3.49 and high level >3.50. Significant p-value (<.05) marked in bold.

Although the students generally evaluated their competence levels to be high or intermediate, there were clearly areas needing improvement through education, which may indicate a need to improve the way these aspects of gerontological nursing are taught. Students reported the lowest level of competence in supporting the sexuality of older persons, for which all three profiles had only low or intermediate confidence. Recognizing and supporting people of different sexual orientations through ageing requires considerable experience and knowledge of cultural and sexual differences (Sinković & Towler, 2018). The second lowest scores were reported for the area of competence in guiding the self-care of the older person. Offering guidance is an important part of nurses' daily work when supporting the patient's independent coping, and requires consideration of the patient's life experiences, history and personality (Backman & Hentinen, 2001). Guidance skills are needed, especially when using and providing support via digital solutions, long-distance care and mobile services (Robert, 2019). Competence in end-of-life care had the third lowest competence scores; again, all three profiles reported low or intermediate levels of competence in this area. Diverse competences are needed when providing end-of-life care in gerontological nursing. Nurses must know how to plan the patient's remaining lifetime (Bryant et al., 2018), operate in different environments (Nasu et al., 2019), address the patient's spiritual needs (O'Brien et al., 2019) and offer treatment for patients' physical, psychosocial and spiritual symptoms along with supporting the family (Rome et al., 2011).

Effective nursing teaching also requires teachers to display a variety of abilities. Previous studies have shown that nurse educators require multiple skills and should inspire students through their teaching (Garbrah et al., 2020; Koskinen et al., 2012; Neville et al., 2014). Teaching should be planned to strengthen competences in core competence areas including clinical nursing, promoting health and well-being, interacting and ethical competences, all of which are central in gerontological nursing (Tohmola et al., 2021a). This requires teachers to have a broad knowledge of gerontological nursing in working life and a diverse perspective on student guidance, along with a deep knowledge of teaching methods and their impact on learning. It is not advisable to integrate gerontological nursing into different subjects because teachers focussed on other topics may lack sufficient knowledge and/or field experience of gerontological care and may even have negative attitudes towards older people (Garbrah et al., 2017). In this study, the most successful and motivated students had completed vocational studies, suggesting that teaching should be not just theoretical but also very practical, incorporating real life stories or older people as teaching assistants (Koskinen et al., 2016). Irrespective of students' chosen specializations, graduating nurses should be competent in gerontological nursing after completing their studies, and gerontological nursing studies should be included in the curriculum for all nursing students (European Commission, 2005; Garbrah et al., 2017). Methodologically it could be beneficial to see the study of gerontological care as a socio-constructivist learning process in

which individual learning is guided by social processes (Danish & Gresalfi, 2018) and students with different backgrounds offer their perspectives on the subject of study. The use of both formal and non-formal learning processes with different foundations allows learning to be developed through interactions with peers, group understanding and collaborative guidance (Danish & Gresalfi, 2018; Stahl, 2013), with the educator playing a key role in assessing the students' skills prior to implementation (Järvelä et al., 2013).

Because it is important to ensure that nurses (especially those from the younger generations examined in this study) are attached to gerontological nursing and interested in working in this field (Shacklock & Brunetto, 2012), efforts should be made to strengthen the motivation and raise the field's profile. Profile A students, who have the lowest level of motivation to work in gerontological care, need to be given a more positive view to motivate them to study gerontological nursing. This could potentially be achieved by offering them more positive life experiences with older people, including both those living independently and those needing help. Such personal contacts with older people could give these students a broader overall understanding of healthy ageing and end-of-life, giving guidance and the diseases of older people, which would be particularly beneficial because students with this profile mostly began studying nursing directly after completing high school or after a previous career in another profession. Although half of profile A students had good grades in gerontological nursing courses, they had the lowest levels of self-assessed competence level and motivation in this field. This may simply be due to the fact that having recently graduated from high school, students with this profile have relatively strong studying skills, resulting in good grades but a lack of practical experience to which they can attach their theoretical knowledge, resulting in poor self-assessed competence. Profile B students with intermediate levels of self-reported competence need to develop their competences in the areas, where they are weakest and should be offered different ways of studying to increase their motivation to engage with gerontological nursing studies because they find the study itself easy but lack motivation. Profile C students require an education that will motivate them to learn more about the subject, for example by offering interesting elective or orientational studies, because they have the skills needed to study while engaged in nursing practice. Clustering is one way to classify students based on their similarities (Pasina et al., 2019), so it may be beneficial for nursing lecturers recognize the backgrounds of different students and modify their pedagogical arrangements accordingly. In some cases, it would be beneficial to group students with different backgrounds so that students with different strengths (e.g. from wide practical experience and advanced study skills) can support and motivate one-another in their studies. In other cases, teachers should group students with similar backgrounds together and support their specific learning needs individually. This may be facilitated by helping students recognize their own competences, for example by performing preliminary competence tests and using the results to plan each student's learning path. Gerontological nursing studies must cover all of the areas addressed by the GeroNursingCom instrument and

should be conducted in a multi-method style, possibly with the direct involvement of older people, in order to interest students in this field of care and motivate them to study it in more detail (Koskinen et al., 2015). This study strengthens the previous understanding that students' personal ambitions must be recognized and that they must be shown that they can fulfil these ambitions in gerontological nursing if they are to be motivated to focus on this field and remain in the profession during their career; simply adding new requirements to curricula is not sufficient (Wilkes et al., 2015).

5.1 | Study limitations

This study was conducted in nine Finnish universities of applied sciences. As such, its results give a national and geographical perspective on the topic. However, there is still a need for further empirical studies to generalize the results and verify their applicability to other cultures. The assessments of students' competences were based on self-evaluations, which may have influenced the results because those who chose to participate may have been more competent than those who chose not to. The reporting of grades was based on the students' recollection of their own gerontological nursing grades because register data (from the electronic records of the participating higher education institutions) was not collected. Some students had completed specialization/orientation studies, which may have affected their knowledge of gerontological nursing and given them opportunities to reflect on nursing older people. This study did not determine whether pedagogical choices or the influence of teachers affected students' learning outcomes. The response rate (34%) was satisfactory since Cohen's d effect size varied from 0.97–2.37, indicating a very large effect size between the competence levels of the three profiles (Cohen, 1992; Lakens, 2013). To strengthen the validity of the research, it was planned, conducted and reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist (Appendix S1) (von Elm et al., 2007).

6 | CONCLUSION

The highest levels of competence in gerontological nursing were displayed by students with previous vocational qualifications, previous healthcare work experience, and high motivation to study. This suggests that achieving high competence in gerontological nursing requires both considerable practical experience in this area and an extensive education. It can also be concluded that during nursing degree courses, the teaching of gerontological nursing needs to be intensified after midpoint of the education to ensure that students have adequate clinical competence. In addition, higher education institutions should offer sufficient credits in gerontological nursing education delivered in a way that reflects its wide scope so that students develop comprehensive expertise in this field. Teachers should account for students' different backgrounds and help them to study

gerontological nursing in their own individual way, taking into account their needs and skills. We recommend more research to qualitatively clarify the specific educational needs of different types of students and to gather data representing a wider international context.

CONFLICT OF INTEREST

No conflict of interest has been declared by the author(s).

AUTHOR CONTRIBUTIONS

AT, SE, KM, RS: Made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. AT, SE, KM, HK, RS, SL: Involved in drafting the manuscript or revising it critically for important intellectual content; given final approval of the version to be published. Each author should have participated sufficiently in the work to take public.

All authors have agreed on the final version and meet at least one of the following criteria (recommended by the ICMJE):

- substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data;
- drafting the article or revising it critically for important intellectual content.

DATA AVAILABILITY STATEMENT

All data generated during this study are included in this published article.

ORCID

Anniina Tohmola https://orcid.org/0000-0001-6463-0536
Satu Elo https://orcid.org/0000-0002-4833-4937
Kristina Mikkonen https://orcid.org/0000-0002-4355-3428
Helvi Kyngäs https://orcid.org/0000-0002-5723-3484
Sinikka Lotvonen https://orcid.org/0000-0003-2849-4340
Reetta Saarnio https://orcid.org/0000-0003-4855-8225

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