

Nurses' informatics competency assessment of health information system usage: a cross-sectional survey

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Abstract

Background: Nurses' informatics competencies affect their use of health information systems (HIS). Informatics competencies are professional requirements for registered nurses to guarantee the quality of patient care. In earlier studies, these competencies have been defined rather intensively, although few studies exist relating to the evaluation of nurses' practical informatics skills and competencies. The purpose of this study was to describe nurses' perceptions of their informatics competencies regarding HIS usage in daily patient care.

Methods: A web-based questionnaire of this national cross-sectional survey was sent to all nurse members including registered nurses, midwives and public health nurses of the Finnish Nursing Association (FNA), the National Association of Health and Welfare Professionals (TEHY), and the National Professional Association for the interests of experts and managers in health care (TAJA) (N= 58 276).

Results: 3610 nurses responded to the questionnaire. The items (n = 16) relating to informatics competencies were grouped into three separate dependent variables: 'Nursing documentation', 'Digital environment' and 'Ethics and data protection'. Nurses evaluated their overall informatics competencies as good. The 'Ethics and data protection' competency score was higher than the scores of 'Nursing documentation' or 'Digital environment'. The competency 'Digital environment' was better for recently graduated nurses and for nurses working in outpatient care and virtual hospital, examination, operation, and labour, and in emergency rooms and emergency care. Experience with using a particular HIS at work was associated with the competency 'Nursing documentation'. The general HIS experience was associated with all competencies.

Conclusions: Nurses are highly qualified HIS users. However, the competency requirements generated by rapidly expanding digitalization have challenged nurses. Thus, it is of high importance to increase different educational programs for nurses using digital tools and software programs. Nurses are knowledge workers 24/7. Unified, standardized, terminology-based nursing documentation has been shown to produce high-quality patient data which also affects patient safety. Therefore, nursing directors should be encouraged to implement nursing terminology in those health care organizations which have not yet done so.

1. Background

Global [1 – 2] and national [3 – 4] digital health strategies seek to implement appropriate digital health technologies for consumers, social and health care professionals and providers, and industry. One of the World Health Organization's (WHO) [1] strategic objectives is to strengthen the governance of digital health at national and international levels, and to support the capabilities and skills needed for countries to promote, innovate and scale-up digital health technologies. Specifically, it is important to promote digital health competencies in education and training for all health professionals and allied workers [1].

The European Union's (EU) target is a digital single market for the EU region, with interoperability through open exchange formats and EU-wide standardization of health information systems (HIS) [5]. Professionals need to be able to access evidence-based information rapidly and easily, but at the same time all EU citizens should have basic digital health literacy skills to enhance the solving of health problems [6]. Finland is one of the forerunners in digitalization, both with the 'Kanta' national data repository [7 – 8] and in the implementation of digital health care services, such as Virtual Hospital digital care pathways [9 – 11]. In the Finnish public healthcare system, HIS coverage has been 100% since 2010 [12]. Digitalization is changing the way nurses work, their workflow, and the way they use knowledge [13 – 14]. The continuum of data to wisdom and the availability of understandable and integrated services are important components of digital care environments [15]. Additionally, digitalization provides new tools for nurses to use HIS data by means of decision support systems, and in administrative decisions. One of the nurses' duties is to empower and guide patients to understand their health data and to motivate them to selfcare with the help of digital tools in virtual care services [2].

Competencies of digital health, defined as "the field of knowledge and practice associated with the development and use of digital technologies to improve health" [1, 16], and informatics competencies have been defined in recent years in several related fields and studies focusing on various health professions. The Healthcare Information and Management Systems Society (HIMSS) and Technology Informatics Guiding Education Reform (TIGER 2020) initiative's interprofessional community updated the global informatics definitions in 2020. Within the core of the health informatics field, the concept of nursing informatics is comprehensive, including information management, analytical sciences, data continuum, data infrastructure, processes and technology. Nursing informatics involves participants from nurses to patients, interprofessional teams and other stakeholders, with the aim of improving efficiency, reducing costs and enhancing the quality of patient care [17].

The definition of nursing informatics competencies has evolved over the years [e.g., 18 – 20]. This is as expected, considering that the new technological advances alongside digitalization have also increased competence requirements for health professionals. As digitalization raises social and ethical issues based on dominant technologies [21], elements of ethics, data protection and security have been included in the core informatics competences for nurses [18, 22 – 23] and other healthcare professionals [20, 24 – 25]. Moreover, attitudes, beliefs, encouragement and motivation have been related to the use, knowledge, skills and competencies of informatics and digitalization [16, 26].

The TIGER core competencies for nursing informatics are a result of a worldwide multi-method study summarizing 24 core competency areas in the five roles of nursing and nursing management in health informatics. According to Tiger recommendations, nursing documentation is an important competency area in clinical nursing and coordination of inter-professional care, as well as in quality management and Information Technology (IT) management in nursing [22 – 23]. Nursing documentation is related to the use of HIS and standardized terminologies, such as Clinical Care Classification (CCC), International Classification for Nursing Practice (ICNP), International Nursing Diagnoses (NANDA-I), Nursing Interventions Classification (NIC) and

Nursing Outcomes Classification (NOC) [27 – 28]. Since nursing documentation is one of the largest data sources in HIS data, it is essential that the data quality is excellent. This facilitates the secondary use of data with e.g., artificial intelligence (AI) tools in digital environments. [29]

Numerous factors have been proposed to affect nurses' informatics competencies. Kleib and Nagle [30] found that especially the quality of informatics training provided by the employer but also age, work setting, educational level, continuing education and training in informatics, previous informatics education and the use of technology in patient care were associated with nurses' informatics competencies. Khezri and Abdekhoda [31] also found that nurses' age had an effect on informatics competencies. In addition to the previous factors, self-efficacy, job satisfaction, evidence-based practice and computer skills, HIS experience related to time spent on it, and clinical experience, were factors associated with nurses' informatics skills.

Although there have been considerable efforts over the years to define the content of core informatics competencies, less attention has been paid to the evaluation of practical informatics skills and competencies [32]. In one Canadian study [30], nurses evaluated their informatics competencies to be adequate. The lowest rated competencies were knowledge and information management, and the highest were ICT skills. In the Netherlands, one study [33] showed that those nurses who were digitally lagging often had insufficient and ineffective digital education. Learning conditions of digital education including HIS training did not meet the nurses' personal learning needs and styles of the content, form and pacing of received formal education. In order to avoid nurses' critical attitude towards HIS [34], the learning conditions should be suitable for their competences, job roles, tasks and working contexts [34 – 39]. Thus, comprehensive training, workflow re-design, and nurse involvement in the HIS implementing project should be provided. In a multidisciplinary team, a common language for the development of digital services is important [25, 40], as are professionals' skills to support patients to choose suitable digital communication tools [41 – 43].

The Finnish national nursing documentation model, which has been integrated into HIS, consists of the nursing process, the structured core nursing data (nursing diagnosis, nursing interventions, nursing outcomes, nursing care intensity and nursing discharge summary) and the standardized terminology, the Finnish Care Classification (FinCC), originally based on the CCC [44]. The nursing discharge summary, which is electronically available both to patients and professionals [7, 44 – 45], is stored in the patient data repository ('Kanta') as required by law [46]. Nationwide cross-sectional surveys on information system services for physicians have been conducted in Finland since 2010 as part of the "Monitoring of health and social care digitalization" projects of the commissions of the Ministry of Social Affairs and Health [47 – 49]. For the first time, a similar HIS survey was extended to nurses in 2017. On the basis of nurses' own self-perceptions, they have particularly good ICT competencies and competencies related to structured national headings, whereas competencies regarding patient-related digital work and structured nursing documentation were less well developed. Higher education and longer experience of HIS use impacted the rather good results [50 – 51], which were utilized in the development of a national curriculum of nursing education [43] and in the update of a digital strategy for nurses [4].

Continuous evaluation is important for the identification of progress and new development areas, and therefore the survey of nurses was repeated in March 2020, just before the COVID-19 pandemic. Referring to the aims of especially the national strategy [3] to develop HISs to support the health and social care domain, professionals and citizens, the purpose of this cross-sectional survey is to describe nurses' perceptions of their informatics competencies regarding HIS usage in daily patient care.

The following research questions were set:

1. What is the current level of nurses' informatics competencies?
2. What factors are related to nurses' informatics competencies?

2. Methods

2.1. Data collection and setting

The questionnaire of this national cross-sectional survey was based on previous studies [49 – 51] assessing professionals' opinions of the functionalities, usability, and support for daily practice of information systems, and the current state of the art of EHR usage in Finland. A slightly updated version of the questionnaire was piloted by a group of 10 nurses enrolled through the University of Eastern Finland, and who received written testing instructions. Based on the testing, some clarifications were made to the terms, especially those relating to nursing documentation, and by separating multi-part claims.

In spring 2020, the web-based questionnaire was sent to all nurse members, including registered nurses (RNs), midwives and public health nurses of the Finnish Nursing Association (FNA), the National Association of Health and Welfare Professionals (TEHY), and the National Professional Association for the interests of experts and managers in health care (TAJA), who had provided an email address (N = 58 276). The term 'nurse' here includes the following: 1) RN, post-secondary education, 2) RN, Bachelor of Health Care, and 3) RN, Master of Health Care and Master of Nursing Science (university degree).

2.2. Instruments

The data for this study consists of a multichoice and background questions (Table 1). The multichoice question relating to nursing informatics competencies was "How well do you feel you have mastered the following skills required by information systems?", including 16 items (Table 2). Items were rated on a 4-point scale ranging from 1 = 'weak' to 4 = 'excellent'. The background questions included variables such as age, year of graduation, educational level, work sector, daily HIS logins, experience as HIS user and IT skills. The data was considered as representative as it corresponded to the age and gender distributions of the population. The data was checked for any inconsistencies and the structure of the data was examined using descriptive statistics.

The 16 items were grouped into three separate dependent variables: 'Nursing documentation', 'Digital environment' and 'Ethics and data protection'. Tentative grouping of the items is based on the previous study by Kinnunen et al. [42]. Some adjustments to item groupings were made based on an exploratory factor analysis. An additional file shows this in more detail [see Additional file 1]. The dependent variables were calculated as the averages of the measurement items. Before computing the variables, Cronbach's Alphas were calculated to examine the reliability of the dependent variables. The 'nursing documentation' consists of nine items ($\alpha = .93$), the 'digital environment' of six items ($\alpha = .86$) and the 'ethics and data protection' of 2 items ($\alpha = .82$). Descriptive statistics (Mean and Standard Deviations) of the dependent variables and items can be found in Table 1.

Table 1
Descriptive statistics of the dependent variables and their items

	N	Mean	Std.Dev.
Nursing documentation ($\alpha = .93$)	3124	2.78	0.63
Documentation of patient care according to the nursing process	3029	2.98	0.70
Documentations in the HIS	3086	3.07	0.67
Documentation of nursing diagnosis (FiCND)	1716	2.53	0.85
Documentation of the aims of the planned care	2594	2.73	0.77
Documentation of planned nursing interventions (FiCNI)	1598	2.55	0.86
Documentation of nursing interventions (FiCNI)	1629	2.63	0.85
Documentation of the assessment of patient outcomes (FiCNO)	1527	2.43	0.86
Documentation of patient care intensity	2074	2.68	0.82
Documentation of nursing discharge summary	2441	2.68	0.82
Working in digital environment ($\alpha = .86$)	3122	2.58	0.65
Basic IT skills	3089	3.15	0.75
Use of clinical guidelines and other research skills at work	2846	2.61	0.81
Supporting the patient to take advantage of the potential of electronic self-assessment and self-care	2484	2.34	0.83
Supporting the patient to choose the most appropriate service	2458	2.36	0.81
Work in the digital healthcare environment	2675	2.52	0.86
The development of eHealth services in multiprofessional collaboration with the patient and other stakeholders	1934	2.12	0.87
Ethics and data protection ($\alpha = .82$)	3089	3.06	0.68
Compliance with data protection and data security principles in daily work	3069	3.07	0.74
Application of the ethical rules in eHealth services	2994	3.06	0.72

FiCND = Finnish Classification of Nursing Diagnosis; FiCNI = Finnish Classification of Nursing Interventions; FiCNO = Finnish Classification of Nursing Outcomes; IT = Information Technology

2.3. Statistical analysis

Statistical analyses were carried out with Stata/IC 15.1 for Windows (StataCorp. 2017). Three separate multiple linear regressions were used to examine the associations of nurses' background variables with the three informatics competencies (nursing documentation, digital environment and ethics and data protection). The same model was fitted for all three dependent variables. We also examined possible multicollinearity problems with the variance inflation factor (VIF). The majority of the VIF was between 1 and 3, indicating no serious multicollinearity. As a default, Stata uses listwise deletion, which deletes a case from the analysis if any of the variables used in the analysis lacks some data. For this reason, the number of observations varies between the three models. Results of these analyses are presented in Table 3.

3. Results

3.1 Background variables

Altogether, 3610 nurses responded to the questionnaire. Most of the respondents (92.7%) were female, with a Bachelor of Health Care degree. The mean age of all respondents was 46, and they worked mainly in the inpatient ward (40.5%) or in outpatient care/virtual hospital (36%). Generally, the respondent needed to login to one (37.2%) or two (33.1%) different HIS during his/her shift. Slightly over one third of the respondents had used the specific HIS for over six years, and nearly 70% evaluated themselves as advanced or expert HIS users (Table 2).

Table 2
Descriptive statistics of background characteristics

	N	Mean	Std.Dev.	min	max
Age	3 132	45.68	11.01	22	67
Graduation year	3 132	2002.60	11.04	1974	2020
Education	Freq.	%			
RN, post-secondary education	1 000	31.9%			
RN, Bachelor of Health Care	1 839	58.7%			
RN, Master of Health Care and Master of Nursing Science	293	9.4%			
Work sector	Freq.	%			
Inpatient ward	1 269	40.5%			
Outpatient care and Virtual hospital	1 126	36.0%			
Emergency room and emergency care	242	7.7%			
Examination, operation and labour	263	8.4%			
Mobile care and home health care	232	7.4%			
Number of daily logins to different HIS	Freq.	%			
0	3	0.1%			
1	1 164	37.2%			
2	1 036	33.1%			
3	513	16.4%			
4	210	6.7%			
Five or more	199	6.4%			
Experience using HIS	Freq.	%			
Less than six months	566	18.1%			
Six months – one year	320	10.2%			
One year – three years	714	22.8%			
Three years – six years	400	12.8%			
More than six years	1 132	36.1%			
Experienced as HIS user	Freq.	%			
Beginner	89	2.8%			
Weak	197	6.3%			
Moderate	714	22.8%			
Experienced	1 263	40.3%			
Highly experienced	869	27.8%			
RN = registered nurse; HIS = Health Information System					

3.2 Nurses' informatics competencies and associated factors

The respondents evaluated their overall informatics competencies as good (mean 2.8). Especially competencies related to ethics and data protection were evaluated as very good. By contrast, the mean of the competency relating to digital environment, the development of eHealth services in multiprofessional collaboration with the patient and other stakeholders, was the lowest (2.12) (Table 1).

The association of background variables with the three informatics competencies can be seen in Table 3. Age had a negative association with all informatics competencies, especially with 'nursing documentation' and 'digital environment'. Experience using a particular HIS in daily work had a weak but consistent positive association with 'nursing documentation'.

Nurses' subjective experience of using a HIS was strongly associated with all informatics competencies. Regarding the work sector, the association with the factor 'digital environment' was very highly significant. The nurse's graduation year also had a strong positive association with the competencies

'digital environment' and 'ethics and data protection'. Master's level education was positively associated with all informatics competencies. The number of daily logins to different HIS was not significant in any of the three competencies.

Table 3
Association of background variables with three informatics competencies (linear regression)

	Nursing documentation	Digital environment	Ethics and data protection
Age	-0.121***	-0.110***	-0.087**
Graduation year	0.075*	0.215***	0.139***
Education (ref. RN, postsecondary education)			
RN, Bachelor of Health Care	0.029	0.035	0.011
RN, Master of Health Care and Master of Nursing Science	0.059***	0.131***	0.072***
Work sector (ref. Inpatient ward)			
Outpatient care and Virtual hospital	-0.032	0.098***	0.022
Emergency room and emergency care	-0.002	0.045**	0.018
Examination, operation and labour	-0.028	0.076***	0.034
Mobile care and home health care	-0.050**	0.012	-0.014
Number of daily logins to different HIS	n.s.	n.s.	n.s.
Experience using a particular HIS daily (ref. Less than six months)			
Six months – one year	0.050**	-0.009	0.014
One year – three years	0.053*	-0.028	0.037
Three years – six years	0.043*	-0.011	0.010
More than six years	0.044	-0.072**	0.037
Experienced as HIS user (ref. Beginner)			
Entry level specialist	0.098***	0.047	0.087**
Intermediate	0.303***	0.133**	0.196***
Advanced	0.559***	0.336***	0.341***
Expert	0.736***	0.541***	0.492***
Observations	3124	3122	3089
R-squared	0.228	0.238	0.126
Adjusted R-squared	0.222	0.232	0.120
Standardized beta coefficients; n.s. = not significant, * p < 0.05, ** p < 0.01, *** p < 0.001			
RN = Registered Nurse, HIS = Health Information System			

4. Discussion

The purpose of this survey was to describe nurses' perceptions of their informatics

competencies regarding HIS usage in daily patient care. Three dependent variables were used:

'Nursing documentation', 'Digital environment', and 'Ethics and data protection'.

The 'Ethics and data protection' competency score was higher than the scores of 'Nursing

documentation' or 'Digital environment'. This refers to relevant content of the nursing

curriculum relating to data protection and data security principles and ethical rules in daily patient care when using digital services [43]. Digitalization is changing the patient-nurse relationship from a face-to-face to a remote connection. Thus, it requires nurses to remotely identify the patient's needs for care, to teach and guide the patient according to his/her needs and to assess patient outcomes. The patient's dignity, integrity, independence and confidentiality and protection of patient data should also be preserved in digital care processes [1 – 2, 4, 16, 22].

Nursing documentation including terminologies is one of the leading areas of expertise in nursing informatics [22 – 23]. Internationally, several standardized terminologies have been developed, validated, translated and used for nursing documentation [27 – 28]. In Finland, nursing documentation skills and competencies are included in the nursing curricula at the Universities of Applied Sciences (UAS), in keeping with the aims of higher education in Europe [43]. However, the national nursing documentation model including the FinCC terminology is not utilized in all health care organizations [44], which might contribute to the slightly lower total competency score of nursing documentation. Nevertheless, when nursing notes are documented by using a standardized terminology, nursing discharge summaries are also accurate, unified and understandable. Thus, the terminology-based documentation better guarantees the continuity of patient care between primary and specialized care [45] and supports patient self-care [7, 46].

FinCC is the only nursing terminology translated and validated to the Finnish nursing culture over 20 years ago, and further developed and used in Finnish health care organizations. The latest version, 4.0, translated into both English and Swedish, was published in 2019. The update was based on an end-user survey and e.g., on several national clinical guidelines, legislation, national instructions, and on scientific research [44]. Despite its long history of development and research, there is still wide variation in the knowledge and skills of how to utilize the structured data. This applies both to nurses and nursing managers. Moreover, reporting systems have not evolved due to the lack of statistics required by the nursing managers. Structured and high-quality nursing data is a basis for utilizing big data in nursing and quality management, [14, 22, 28] affecting the reliability of results produced by AI tools, such as problem-solving software programs, to provide support to nurses and help them make more informed decisions in patient care [29].

Inadequate training, lacking connections with daily work processes, has been presented to associate with the lack of digital skills [33]. According to nurses, the best way to learn is learning by doing [45]. Thus, parallel to teaching how to use the HIS, there is a need to teach terminology use as well as how to integrate the latest information models into information systems and clinical nursing practices and work processes. Unfortunately, in this study, every competency factor category is probably affected by the fact that, despite the continuing training requirements of health care organizations [35], the continuing training of nurses' use of HIS is not organized systematically among them [33, 38 – 39].

Finland is one of the leading countries in the digitalization of health care [12]. However, the results of this study showed that nurses may not have sufficient competency to manage in a rapidly changing digital environment. New digital platforms and services have generated requirements for nurses to learn digital skills while, at the same time, nurses also need to teach patients how to choose and use the most suitable digital services [14]. For example, mobile devices are already widely used for checking or recording patient data [12].

The competence 'digital environment' appeared to be positively associated with a more recent graduation year, which indicates the more relevant current curricula of the UASs, which include digital skills and competencies. For example, one learning objective in the nursing curriculum is that the nursing student can demonstrate competences in using digital services as a part of holistic patient care [4, 40, 43]. Compared to the inpatient ward, the 'digital environment' competence was slightly better in outpatient care and in the virtual hospital, examination, operation, and labour areas and in the emergency room and emergency care. This refers to Finnish national initiatives, such as the HealthVillage.fi digital care services developed by the Virtual Hospital 2.0 project [10 – 11], Self-Care and Digital Value Services [8], the use of 'Kanta', the national data repository, and the national guidance of information management in social welfare and health care. The 'Kanta' services include components, such as for citizens My Kanta Pages, and for professionals Prescription Centre and Pharmaceutical Database, Patient Data Repository, Data Management Service, Data Repository for Social Services, and Kanta Personal Health Record. In sum, the Kanta services ensure access to the patient data in situations where the patient receives treatment from many different actors and in different places [7, 49].

Only a minority of the respondents evaluated themselves as beginners or entry-level specialist HIS users, which is a slightly better result than three years ago [50]. Furthermore, nurses' practical and subjective experience of HIS was associated with all three dependent variables: nursing documentation, digital environment, and ethics and data protection. Since the mean age of the respondents was 46, this might refer to a longer working career, and to the wide implementation and use of HIS both in public and private health care, also in social services where it is increasing, and the continuous development of digital health infrastructure over several years in Finnish health care services [12].

Conservative interpretation of the results indicates that it takes about six months to learn a new system. This fact needs to be considered when introducing and implementing new systems and services for health care professionals [8]. Nurse's motivation plays a vital role in eHealth performance and maintenance. Evidence-based methods, such as action planning and participatory approach, should be promoted. Furthermore, plans for user-centered changes in the work environment, motivation, encouragement and social support have been introduced to strengthen the use and success of HIS implementation and informatics competencies [16, 26].

Study limitations of consideration include the fact that the data was collected in the spring of 2020, simultaneously with the onset of the COVID-19 epidemic that challenged Finland's health care system. Due to this situation, only one reminder was sent, resulting in a final sample size of 3610. Considering this, the lower than anticipated response rate can still be considered a good achievement. The sample included slightly more women and respondents over 40 years of age. However, most of them were registered nurses with a Bachelor of Health Care degree, and HIS end-user groups. Since in a cross-sectional study design interpretations are associations, not causal inferences, in many surveys, the data includes self-reported measures and not an external assessment of experiences or competencies. However, self-assessment is a central part of learning new skills.

5. Conclusions

Nurses are highly qualified HIS users. However, the competency requirements that the rapidly expanding digitalization has generated have challenged social and health care professionals. Younger, recently graduated nurses, generation Z, are more competent to use digital services. Thus, it is of high

importance to increase different training programs for working nurses and for senior nurses with no or too little education and training in the use of digital tools and software programs. Both nurses and their employers are responsible for continuing education in nursing informatics skills and competencies. This goal is in line with national and international strategies.

Nurses are knowledge workers 24/7. Unified, standardized, terminology-based nursing documentation has been shown to produce high-quality patient data, which also affects patient safety. Therefore, nursing directors are encouraged in their decision making to implement nursing terminology in those health care organizations which have not yet done so. Further multi-method studies are needed of the informatics competencies of nurses and nursing directors and the needs and effectiveness of informatics education relating to nursing documentation, digital environment, ethics and data protection in different age groups and clinical settings of health care professionals.

Declarations

Ethics approval and consent to participate

All methods of the research have been carried out in accordance with the Declaration of Helsinki. Ethical approval for the study was provided by the Institutional review board (IRB) of the Finnish Institute for Health and Welfare (THL/482/6.02.01/2020). The guiding words in the beginning of the questionnaire filled in by the participants were as follows: filling in the questionnaire was regarded as informed consent. Therefore, the authors consider that written informed consent was obtained from the participants.

Consent for publication

Not applicable

Availability of data and materials

The datasets generated and analyzed during the current study are not publicly available due to co-registratorship between the University of Eastern Finland and the Finnish institute for health and welfare, the controllers of the data, but are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

All the authors made a significant contribution to this manuscript. The first author (UMK) was responsible for the study design and the first draft of the manuscript, the authors (A.Kuusisto, OA, A.Kaihlainen, TH and TV) contributed to the review of the manuscript and further conception of the study design. Authors UMK, SK and TV were responsible for the data collection, and SK was responsible for the data analysis and interpretation of data together with all authors.

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