EMPIRICAL RESEARCH QUALITATIVE

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Home care professionals' experiences of successful implementation, use and competence needs of robot for medication management in Finland

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Abstract

Aim: To describe home care professionals' individual experiences of the implementation, use and competence needs of a robot for medication management in older people's home care.

Design: A qualitative focus group interview study.

Methods: Data were collected during spring and autumn 2021 by semi-structured focus group interviews and analysed using inductive content analysis. The participants were 62 home care professionals working in older people's home care.

Results: The successful implementation and use of the robot for medication management consisted of a timely and adequate introduction before the implementation of the robot, the fluent usability of the robot in daily work, and confidence in work competence. There is a need for the reorganization of home care professionals' use of digital solutions to make workflow fluent, prevent burnout and turnover among home care professionals. Professionals' competence should also be developed to ensure that it corresponds to digitalized healthcare.

Patient and Public Contributions: No patient or public contribution.

KEYWORDS
competence, home care professional, medication management, robot, older people's home care, qualitative research

1 | INTRODUCTION

Medication management is one of the most important tasks of home care professionals providing daily care. (Puustinen et al., 2020; Zanjal & Talmale, 2016.) On average, older people in home care have one to five different scheduled medications on a daily basis. In addition, they use over-the-counter medications at the same time (Mira, 2019; Rochon, 2022). Simultaneous use of different medications has increased over the past four decades and the proportion of polymedicated older people is increasing along with increasing the ageing population (Fimea, 2021; Lagerin et al., 2020). Medication errors are commonly representing between 30% and 50% of all practice errors in healthcare. (Dionisi, Di Muzio, et al., 2021) In older people's home care, medication errors are common (Dionisi, Di Simone, et al., 2021)

and the most commonly reported errors are the omission of medication doses (47.4%) (Härkänen et al., 2020) focusing on dispensing (29%) or administrating medications (23%) (Laatikainen, 2020).

Safe medication process in home care includes ordering, dispensing, reconstitution, administration, monitoring the effects of medications and medication education (Karttunen et al., 2019). Traditionally, home care professionals order medications for older home care clients from a pharmacy and manually dispense them to the clients' dispenser as a week's supply of medications. During daily home visits, they administer medications using different routes and in different forms including tablets and injections, which is the most time-consuming and error sensitive part of medication management (Berland & Bentsen, 2017; Lindblad et al., 2017).

Multidisciplinary home care professionals are required to pay extra attention to the safety of the medication process in home care and prevent the over-prescription of medications, polypharmacy, and errors that might endanger older people's safety in home care (Vaismoradi et al., 2021). In Finland, the multidisciplinary team of home care professionals consists of doctors, registered nurses, public health nurses, and practical nurses working in home care. In Finland, registered nurses and public health nurses study at the University of Applied Sciences, and they have completed a level-six education according to the European Qualifications Framework (European Union, 2018) and practical nurses have completed a vocational qualification and nationally regulated level-four training in social and health care (Gobbi & Kaunonen, 2018). In collaboration with doctors, registered nurses and public health nurses are responsible for older people's medication management. Practical nurses carry out medication management in the daily care in older people's homes. They work closely with registered nurses and public health nurses to ensure safe medication management (Vaismoradi et al., 2021).

The recent development and use of digital solutions in older people's home care can have a positive effect on the quality of older people's care given the provision of support to older people's independent living in their own homes (Turjamaa et al., 2019; Zhang et al., 2022). Although people in developed countries are healthier and live longer at home (de Bruin et al., 2018) they often suffer from various chronic diseases (World Health Organization, 2020). For home care, this means a need for more workforce and a higher cost of healthcare services. Therefore, home care should be able to meet the challenge and the demand caused by the increasing number of older people and the economic pressure it entails (Dostálová et al., 2021; Dugstad et al., 2019). Digital solutions empower older people to live longer in their own homes and decrease the number of daily home visits by home care professionals and the hospitalization rate. Therefore, they have been suggested as a suitable solution for older people living in remote areas and with limited access to home care professionals (Nakrem et al., 2018; Schelisch & Walter, 2021).

Currently, digital solutions have been developed for the implementation of the medication process in older people's homes (Kleiven et al., 2020; Turjamaa et al., 2020). Digital solutions for smart medication management include apps (Al-Saleh et al., 2022;

Ping et al., 2022), as well as sensors and robots (Martini et al., 2022; Rantanen et al., 2017) to remind older people of taking the right medication at the right time. The use of the digital solutions helps streamline home care professionals' daily schedules (Turjamaa et al., 2019). In Finland, home care has been encouraged to implement robotic medication management (Ministry of Social Affairs and Health, 2020) as the use of robots for medication management allows the implementation of older people's independent medication management (Turjamaa et al., 2020).

Home care professionals' involvement is key to the safe implementation of robots for medication management (Kleiven et al., 2020; Turjamaa et al., 2020). It has been reported that home care professionals are sceptical of digital solutions because the implementation of new solutions increases their already heavy workloads (Kleiven et al., 2020). Digitalization challenges healthcare professionals' competence broadly across healthcare sectors (Jarva et al., 2021; Persson et al., 2021). In this study, competence refers to "functional adequacy and capacity to integrate knowledge, and skills to attitudes and values into specific contextual situations of practice" (Meretoja et al., 2004). Healthcare professionals' eHealth competence has been described as their knowledge of digital solutions and related skills for the use of those solutions in order to provide ethical patient-centred care including social and communication skills and ethical issues of digitalization (Konttila et al., 2019). Home care professionals are uncertain about their competence in the use of digital solutions (Andersson et al., 2017; Persson et al., 2021). However, the provision of high-quality care using technology requires knowledge and skills as well as the adoption of new work methods (Beedholm et al., 2016; Persson et al., 2021). Therefore, the implementation and use of digital solutions in home care routines can be challenging for home care professionals (Johansson-Pajala & Gustafsson, 2020; Persson et al., 2021). Organizational, cultural, technological and ethical barriers that hinder the implementation and use of digital solutions in older peoples' care have been recognized (Dugstad et al., 2019). However, home care professionals play an important role in the implementation of digital solutions and in encouraging older people to use these solutions in home care (Johansson-Pajala & Gustafsson, 2020; Persson et al., 2021). Therefore, knowledge and understanding of the implementation and use of robots for medication management based on home care professionals' experiences should be improved. This paper uses the term implementation to refer to the situation in which the robot is new to home care professionals, and they gradually become familiar with how to use the robot. The term used refers to the application of the robot in daily care when the professionals are familiar with the robot.

1.1 | Aim of the research

The aim of this study was to describe the home care professionals' experiences of the implementation and use of the robot for medication management in older people's home care. In addition, it aimed to describe home care professionals' experiences of the needed

TABLE 1 The background characteristics of the participants

Variable	n		
Occupation			
Practical nurse	49		
Registered nurse	8		
Public health nurse	5		
	Mean	Min	Max
Age in years	45	18	58
	0–3 years	3–5 years	Over 5 years
Work experience in nursing, years	13	11	38
	1 year	3 years	Over 5 years
Work experience in older people's home care, years	22	16	24

competence to ensure the safe implementation and use of the robot for medication management.

The questions addressed in our research were as follows:

1. What are the experiences of home care professionals in implementing the robot for medication management in the home care of older people?
2. What are the experiences of home care professionals in the use of the robot for medication management in the home care services of older people?
3. What kind of competence is needed to ensure the safe implementation and use of the robot for medication management?

2 | METHODS

2.1 | Design

A qualitative design was used to explore the experiences of research participants to understand individuals' experiences of social phenomena (Sandelowski, 2000). The semi-structured focus group method was used for data collection (Barbour, 2010; Bourgeault et al., 2010) and the data were analyzed using inductive content analysis (Vaismoradi & Snelgrove, 2019). The Consolidated Criteria for Reporting Qualitative Research (COREQ) was used for reporting the study (Tong et al., 2007).

2.2 | Research environment and study participants

The study was carried out in government-funded home care in a rural region in Eastern Finland during the spring and autumn of 2021. In Finland, home care is organized in collaboration with local municipalities and other organizations, such as private companies and the not-for-profit sector. The services that older people receive are based on legislation and planned and implemented in collaboration with the older people, their relatives and home care professionals (Act, 980/2012). The collaboration

organization employs about 800 home care professionals and has 1,500 older people as clients. The organization obtained robots for medication management. Altogether 110 older people were given a robot for medication management during the year 2021. The robot is part of the home care service and older home care clients pay a monthly service fee based on their incomes. The main purpose of the robot is to assist home care clients by dispensing their medications at the right time. The robot, which stands on a table, assists older home care clients by dispensing their medications at the right time. Pharmacies dispense medicines that are to be taken regularly packed in single-dose bags that are sufficient for 2 weeks. After that, the pharmacies deliver the bags to home care services, and home care professionals load them inside the robot. When it is medication time, the robot provides guidance for taking medications, both by issuing spoken instructions and sound signals and by displaying written instructions on the device screen using indicator lights. If the medication is not taken after multiple reminders, the dose is locked inside the device and home care professionals are notified. The robot enables the monitoring of medication management and maintains an electronic treatment record of each dose taken by the client. In addition, the robot for medication management enables home care professionals to plan and complete home visits with more flexible schedules.

After receiving the research permission, the researcher (blinded for review) contacted the head of home care and provided information about the study and inclusion criteria for home care professionals as study participants. Inclusion criteria were as follows: (1) voluntary participation in the study, (2) working experience in older people's home care, (3) having the experience of implementation and use of the robot for medication management and (4) being Finnish or English speaker. The head of home care asked home care professionals about their interest to participate in the study. Sixty-two home care professionals enrolled as voluntary participants. After that, home care supervisors planned interview times in collaboration with the researcher and organized home care professionals for the interviews. The participants were mostly practical nurses (n = 49) and their mean age was 45 years. They had over five years of work experience in older people's home care (Table 1).

2.3 | Data collection

The semi-structured focus group method was used for data collection, providing the participants an opportunity to talk and reflect aloud on their own and each other's thoughts. Therefore, they could present their shared and individual experiences of the robot for medication management (Barbour, 2010; Bourgeault et al., 2010). The interview themes were developed by the research team based on the previous literature (Turjamaa et al., 2020). The interview guide comprised the following themes: (i) experiences of the implementation of the robot for medication management; (ii) experiences of the use of the robot for medication management; and (iii) required competence for implementing and using the robot (Table 2). During the first interviews, the themes were tested and found appropriate for the purpose of the data collection. The participants were also asked about their background data such as age, occupation, work experience in nursing in years and work experience in older people's home care in years.

Due to the Covid-19 pandemic, the focus group interviews were carried out and recorded online via the video conference application by the researcher (blinded for review). The interviews began with an introduction followed by a discussion on the included themes until conclusions were reached. Twelve focus group sessions, with three to six participants in each were held by the same researcher to achieve data saturation. The interviews lasted from 43 to 110 minutes and their total duration was 16 h and 20 min.

2.4 | Data analysis

Data were analyzed using the inductive content analysis method (Elo & Kyngäs, 2008; Gibbs, 2007). The recorded data were transcribed, yielding 193 pages of text on A4 paper printed with 1.0 line spacing. All the transcriptions were read through to understand the overall content of the interviews. They were categorized by identifying meaning units in terms of single words, a combination of words, sentences, or whole paragraphs, according to the research questions.

TABLE 2 Themes of the focus group interviews

Theme I: Experiences of the implementation and use of the robot for medication management
1. What are the aspects that support the implementation of the robot for medication management?
2. What are the aspects that support the use of the robot for medication management?
3. What are the developmental aspects in the implementation and use of the robot for mediation management?

Theme II: Competence required to ensure the safe implementation and use of the robot for medication management
1. What kind of competence is required for the use of the robot in medication management?
2. What kind of education and training did you receive before the use of the robot in medication management?
3. What kind of competence is required to be able to teach the implementation and use of the robot to older people?

Next, the data were grouped into sub-categories and main categories. The final phase of data analysis was conducted together with the entire research group when writing the results (Hsieh & Shannon, 2005; Vaismoradi & Snelgrove, 2019).

3 | RESULTS

3.1 | Home care professionals' experiences of the implementation of robots for medication management in older people's home care

Based on our analysis, the home care professionals' experiences of the implementation and use of the robot for medication management can be described as follows: (i) timely adequate introduction before the implementation of the robot including clear written instructions and technical support round the clock and (ii) the fluent usability of the robot in daily work including flexibility of schedules during the work shift and medication safety. In addition, home care professionals' experiences of the needed competence to ensure the safe implementation and use of the robot for medication management can be described as (iii) current competence towards the use of digital solutions, preconceived attitudes, and competence to evaluate the robot's suitability for older people, and advising them on the use of the robot.

3.1.1 | Timely and adequate guidance and technical support on the robot for medication management

Home care professionals described that despite the introduction of exciting changes in older people's care including the robot, they were able to cope with this new change thanks to the presence of timely and adequate support and guidance about the robot for medication management. Sufficient trainings were arranged for professionals before the adoption of the robot. For instance, they practised how to use the robot in the meeting room. In addition, the robot was available around the clock and the opportunity for individual training was provided. Written and illustrated information sheets increased the intelligibility of using the robot for medication management.

> I was terrified at the beginning when I heard that we are implementing digital technology in the form of robots for the medication process. However, they are easy to use and the information sheets with step-by-step instructions are clear. You cannot go wrong! (FG 3, Informant 3)

The home care professionals highlighted the possibility of contacting technicians to get technical support around the clock and to report any issues. This was seen as very important because they worked on their own and could not ask a colleague for help. Technical support supervised, counselled, encouraged, controlled, and monitored robots for the medication process. This possibility

was available for home care professionals when they followed older people's use of the robot. It was valued as a matter of medication safety.

> I am happy for the chance to call technical support. They will always answer, and they advise patiently. (FG 11, Informant 6)

In each team, one trained home care professional took the responsibility for training other team members. Professional and peer support were acknowledged by the home care professionals as important elements that improved the safety of robot use. On the other hand, they rarely met other colleagues during their work shifts because they were alone when visiting older people's homes. Therefore, learning how to use the robot independently was of great help.

3.1.2 | The fluent usability of the robot

The home care professionals stated the fluent use of the robot in daily work within home care in terms of flexibility of schedules during the work shift. The use of the robot for the purpose of medication safety was emphasized. They explained that the robot would alert them if someone tried to unlock the robot at the wrong time. However, the older people would not be able to open it because it required a username and a password. In addition, it would inform them if the older people had not taken their medication at the right time. At the same time, it also meant that the older people could not take their medications too late.

> Many older people have memory disorders. Before the implementation of the robot, I was constantly afraid that they were taking medications at the wrong time. It could have had fatal consequences. (FG 5, Informant 1)

The participants pondered that using the robot for the medication process increased the flexibility of work schedules during the work shift. The time reserved for home visits was reduced and some home visits could be omitted. The robot also brought flexibility to their daily work schedule given that they did not have to stay in the older peoples' homes for a certain amount of time to take care of medications. In addition, some older people had virtual home visits. It made it possible to verify virtually whether they had taken their medications. It was considered that the use of the robot reduced professionals' mental burden as there was no pressure to visit a particular person at a certain time.

> Now there is an opportunity to plan my work shift with more flexibility. Previously, there was a feeling that I had to be with all older people at the same time and take care of medications. (FG 7, Informant 4)

In contrast, the home care professionals pondered that the robot obliged older people to stay at home. Some older people needed to go outside to visit friends or go shopping. However, they could not take the robot with them. Furthermore, as professionals' home visits were cancelled due to the use of the robot, they had concerns about the older people's increased loneliness. On the other hand, some older people enjoyed the opportunity to take the responsibility for the medication process and felt that it increased their sense of independence.

> One of the older people said that luckily, home visits have decreased. She does not like many professionals visiting her home. That's why she is glad that she got this robot. (FG 10, Informant 1)

Robots sometimes caused some problems for the home care professionals. Due to technical issues the robots would break down, which changed the home visit schedules. The professionals considered whether there should be another robot in reserve to be taken to the older peoples' homes. Despite such obstacles, the professionals thought that the robots worked fine and had only a few bugs.

> The robot's alarm sound is terrible. One older person said that she would throw the robot out the window if she didn't get help quickly. (FG 3, Informant 5)

3.2 | Home care professionals' experiences of needed competence to ensure safe implementation and use of robot for medication management

The home care professionals assessed their needed competence to implement and use the robot for the medication process based on three perspectives including current competence towards the use of digital solutions, preconceived attitudes, and competence to evaluate the robot's suitability for older people and advise them on the use of the robot.

All home care professionals mentioned that the use of the robot had developed their competence in the application of digital solutions. They felt that earlier experience and knowledge regarding the use of digital solutions was not required. The use of the robot was exciting, their self-confidence increased, and the use of the robot proceeded as normal. The professionals received support from their digitally oriented peer colleagues. Nevertheless, the participants pondered that there should be more responsible users in the community. Also, access to experts during holidays should be guaranteed to safeguard the medication process.

> The first time was really thrilling. I watched how a young colleague used the robot for the very first time. It was so natural. Luckily, we also have young colleagues in the workplace. (FG 2, Informant 3)

The home care professionals indicated that attitude plays a role in whether someone learns to use the robot. A positive attitude was associated with learning a new skill. In general, no one opposed the incorporation of the robot into clinical practice. On the contrary, the

participants were excited about using the robot because it facilitated their work and eliminated hurry during work shifts.

> Attitude matters. If you have a negative attitude towards new solutions, you won't learn how to use them. We were all excited about the robot and we wanted to learn how to use it. (FG 5, Informant 2)

The home care professionals highlighted the importance of knowing how to use the robot smoothly before being able to instruct the older people about its application. In addition, they explained how significant their competence was in advising home care clients on the use of the robot. They had to ensure that the home care clients had the ability to learn how to use the robot. Furthermore, the home care clients needed to be able to take medications independently and they had to remember to take their medications. These were essential requirements for the home care clients to ensure the safe use of the robot. Lack of required competence led to robot's inactivity or even incorrect medication process.

> Some older people first became skeptical about the robot. We practised the use of the robot together and after that they no longer wanted to give up the robot. It was lovely to see that they enjoyed learning a new thing. (FG 9, Informant 2)

4 | DISCUSSION

This study provided new knowledge about home care professionals' implementation and use of the robot for medication management as well as the needed competence to ensure safe implementation and use of the robot for medication management in older people's home care. Our results indicated that *during the implementation the robot for medication management*, there was a need for timely education and training before robot use and for on-time technical support, which is in line with the findings of previous studies (Glomsås et al., 2020; Kleiven et al., 2020). Based on our results, the home care professionals considered that the home care organization had planned adequate training in collaboration with technical support for the successful implementation and use of the robot for medication management. Furthermore, professional and peer support were acknowledged by the home care professionals as important elements that improved the safety of robot use, as also indicated by Johansson-Pajala & Gustafsson (2020) in their study. In contrast, limited involvement of home care professionals can reduce home care professionals' engagement, preventing opportunities for expanding and developing the use of digital solutions. The successful implementation and use of the robot required adequate training; without it, home care professionals might have based their expectations towards robots on their limited experiences. Habituation and first-hand experiences with digital solutions increase the acceptance of new solutions (Höflich & El Bayed, 2015; Jarva et al., 2021; Melkas et al., 2020).

Based on our results, the home care professionals believed the robot improved the monitoring of the medication process and on-time interventions to prevent medication errors. The administration of medications by hand often takes up much of the daily schedules of home care professionals because medications need to be given at the right time (Berland & Bentsen, 2017; Lindblad et al., 2017). Our results showed that the robot for medication management facilitated scheduling home care professional's work routines. Medication management is a time-consuming and error-prone task that requires compliance with strict schedules, which causes stress and concerns for patient safety. Mistakes during medication management, including medication administration, are well-known threats to home care (Härkänen et al., 2020; Lindblad et al., 2017). Medication errors have serious implications for older people' health in terms of morbidity, human suffering, and even death. In addition, medication errors indirectly impose huge costs on the healthcare system and society (Dostálová et al., 2021).

The home care professionals raised concerns about older people becoming home-bound because the robot obliged them to stay at home. Current home care for older people has been criticized for organization-based care with fragmented services (Dostálová et al., 2021; Pauget & Dammak, 2019). Therefore, it is important that clients are given the opportunity to play an active role when planning home care where digital solutions are an important element. Older people are experts in their own lives, with positive attitudes towards digital solutions, and therefore they should be included already in the development stages of digital solutions.

Based on our study, the home care professionals assessed their *needed competence to implement and use the robot for the medication management* based on three perspectives including current competence towards the use of digital solutions, positive attitudes, and competence to evaluate the robot's suitability for older people and advise them on the use of the robot. The implementation and use of the robot for medication management increases home care professionals' needed competencies, which is in line with a previous study (Jarva et al., 2021). In addition to this, home care professionals were not uncertain about the implementation and use of the robot, unlike reported in a previous study (Kleiven et al., 2020). The home care professionals justified this by the fact that the implementation and use of the robot for medication management did not require prior competence due to its ease of use. However, they emphasized that the use of the robot for medication management increased their eHealth competence, which has not been extensively acknowledged in previous research (Henneman et al., 2017; Konttila et al., 2019).

Based on our results, home care professionals had positive attitudes towards digitalization, and they described that the implementation of the robot for medication management was exciting. Home care professionals found the implementation and the use of the robot as an opportunity to learn new skills, which contributed to the development of competence (Bartosiewicz et al., 2021). Contrary to this, it has been reported that home care professionals may be sceptical and prejudiced against digital solutions because

the use of new solutions increases their workloads. In addition, they are uncertain about their own competence in the use of digital solutions (Andersson et al., 2017; Persson et al., 2021). It is understandable that a lack of eHealth competence along with inadequate training can lead to frustration among home care professionals (Frennert, 2019).

Our results showed that home care professionals pondered their competence to evaluate the robot's suitability for older people and advise them on the use of the robot. It is evident that home care professionals play an important role in encouraging older people to use these robots in home care (Johansson-Pajala & Gustafsson, 2020; Persson et al., 2021). In addition, home care professionals emphasized that before using the robot for medication management, it must be ensured that the older clients' cognitive skills and physical capacity are sufficient. Therefore, older clients with memory disorders need to have access to digital solutions early enough to be able to learn about them and benefit from their use as reported in the previous study (Holthe et al., 2018).

4.1 | Study strengths and limitations

This study has some limitations that should be taken into consideration. Our results do not represent the experiences of all home care professionals in Finland regarding the use of the robot for medication management. However, we believe that they can reflect the common aspects of the experiences of home care professionals who had experiences with the implementation and the use of the robot for medication management and worked in older people home care. In line with qualitative methods, the number of participants was limited, but it enabled concentration on participants' multiple views of the study phenomenon. The use of focus group interviews as a data collection method could have impacted the depth of data collection and insight into the study phenomenon compared with individual interviews (Guest et al., 2017). At the beginning of the interviews, the researcher tried to establish a relationship with the participants based on trust and confidentiality. Accordingly, the participants were reminded of the voluntary nature of participation in the study and respect for their anonymity. The home care professionals shared their thoughts with familiar colleagues during the interview rounds and discussed their experiences in confidence. Furthermore, variations in the shared experiences and opinions gave the authors enough confidence regarding the depth of data collection. After the twelfth interview, the authors carried out the preliminary analysis and agreed that satisfactory saturation had been achieved. In addition, the research process including planning, data collection, and analysis, were carefully documented, and performed, to achieve the trustworthiness of the research. (Elo et al., 2014.) Furthermore, the research report was presented using The Consolidated Criteria for Reporting Qualitative Research (COREQ). (Tong et al., 2007.) The research results were confirmed by the entire research group.

5 | CONCLUSIONS

Our study focused on home care professionals' experiences of implementation and use of the robot for medication management in older people's home care as well as their experiences of needed competence to ensure the safe implementation and use of the robot for medication management.

We found that the home care professionals' experiences of the implementation and use of the robot for medication management focused on timely adequate introduction before the implementation and the fluent usability of the robot in daily work. In addition, home care professionals' experiences of the needed competence included current competence towards the use of digital solutions, preconceived attitudes, and competence to evaluate the robot's suitability for older people and advising them on the use of the robot.

Digital solutions will enhance the complexity of older people's home care in the future. In addition, the use of digital solutions should consider in they make the workflow fluent, prevent burnout and turn-over among home care professionals. Therefore, there is a need to deepen our understanding of the implementation and use of digital solutions in the face of digital challenges. Home care professionals' individual eHealth competence should be developed. They need education and training and appropriate support to be able to use all capacities of digital solutions in home care. The reorganization of home care professionals' daily work with digital solutions at the organizational level is emphasized. Future research is needed to examine the experiences of older people regarding the implementation and use of the robot for medication management in order to provide a more comprehensive picture of this phenomenon. In addition, research focusing on whether the use of the robot affects medication administration incidents is required to develop safe medication management.

AUTHOR CONTRIBUTIONS

Study design: Riitta Turjamaa, Mojtaba Vaismoradi, Satu Kajander-Unkuri, Mari Kangasniemi. Data collection: Riitta Turjamaa, Mojtaba Vaismoradi, Satu Kajander-Unkuri, Mari Kangasniemi. Data analysis: Riitta Turjamaa, Mojtaba Vaismoradi, Satu Kajander-Unkuri, Mari Kangasniemi. Manuscript writing: Riitta Turjamaa, Mojtaba Vaismoradi, Satu Kajander-Unkuri, Mari Kangasniemi.

All authors have agreed on the final version and meet at least one of the following criteria [recommended by the ICMJE (http://www.icmje.org/recommendations/)]:

- 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.

CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

ETHICAL STATEMENT

The Ethics Committee of the University of Eastern Finland provided ethical approval (24/2017).

DATA AVAILABILITY STATEMENT

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

AUTHORSHIP STATEMENT

All authors listed meet the authorship criteria according to the latest guidelines of the International Committee of Medical Journal Editors and all authors are in agreement with the manuscript.

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