Oona Herzog and Karen Njoroge

Nurses' Skills Required in Telecare

A Literature Review

Helsinki Metropolia University of Applied Sciences

Health Care and Nursing

Degree Program in Nursing

Final Project

June 2014

Metropolia

Abstract

Author(s) Title Number of Pages Date	Herzog Oona, Njoroge Karen Nurses' Skills Required in Telecare 20 pages + 4 Appendices 02.06.2014
Degree	Bachelor of Nursing
Degree Programme	Degree Programme in Nursing
Instructor(s)	Niina Eklöf Eila-Sisko Korhonen

The purpose of this final project was to describe what are the nurses' skills required in telecare. The aim of this project was to improve nursing practice in telecare. The study question was: What are the nurses' skills required in telecare?

The methodology of this final project was a literature review. Electronical database search was conducted in two different databases and a total of six articles were selected for review. One article was selected from Cinahl (EBSCO) and four from Medline (Ovid) databases and one article was retrieved manually from the bibliographies of the articles used. The selected articles were analysed using the principles of inductive content analysis.

The results were then grouped into four categories which illustrate nurses' skills required in telecare. The four categories are: Assessment skills, organizational skills, patient education, adaptive skills. The overall conclusion was that nurses need more training in ICT skills and general training about what devices are available and how they are operated. Such approach could improve the nurse-client relationship, such as communication and quality of care.

There is a need for more studies about nurses' skills required in telecare. Currently, many researches about telecare study only clients' experience and the devices. There is also need for more studies that would clearly define telecare, telehealth and telemedicine.

Keyword	Telecare

Abstract

Kirjoittajat Työn nimi Sivumäärä Päivämäärä	Herzog Oona, Njoroge Karen Nurses' Skills Required in Telecare 20 sivua + 4 liite 02.06.2014
Koulutusohjelma	Hoitotyö
Suuntautumisvaihtoehto	Sairaanhoitaja AMK
Ohjaajat	Niina Eklöf Eila-Sisko Korhonen

Tämän opinnäytetyön päämäärä on tuoda esille, mitkä sairaanhoitajan taidot ovat oleellisia telehoidossa (telecare). Projektin tavoite on parantaa hoitokäytäntöä telehoidossa. Tutkimus rakentuu seuraavan kysymyksen ympärille: mitkä sairaanhoitajan taidot ovat oleellisia telehoidossa?

Opinnäytetyön metodologia perustuu kirjallisuuskatsaukselle. Sähköisen tietokantatutkimuksen kohteena oli kaksi erilaista tietokantaa ja kaiken kaikkiaan kuusi artikkelia valittiin katsauksen pohjaksi. Yksi artikkeleista on Cinahl (EBSCO)- kannasta ja neljä Medline (Ovid)- kannasta, lisäksi yksi artikkeli pohjautuu valittujen artikkelien lähdeluetteloihin. Valitut artikkelit analysoitiin induktiivisen sisältöanalyysin periaatteiden pohjalta.

Tulokset jaettiin sitten neljään ryhmään, jotka kuvaavat telehoidossa tarvittavia hoitajaominaisuuksia. Nämä neljä ryhmää ovat: arviointikyky, organisointikyky, potilasohjaus ja sopeutumiskyky. Johtopäätökseksi muodostui, että sairaanhoitohenkilökunta tarvitsee enemmän harjoitusta ICT- taidoissa ja yleiskoulutusta siihen liittyen, mitä telehoitolaitteita on olemassa ja miten niitä käytetään. Tämä lähestymistapa saattaisi kehittää hoitaja-potilas-suhdetta kuten kommunikaatiota ja hoidon laatua.

Jatkossa olisi tarvetta uusille telehoidossa tarvittavia hoitajaominaisuuksia käsitteleville tutkimuksille. Toistaiseksi monet telehoitoa koskevat tutkimukset koskevat vain asiakkaiden kokemuksia ja telesairaanhoidon laitteita. Tarvittaisiin myös tutkimuksia, jotka selvittäisivät tarkkuudella termit telehoito (telecare), teleterveys (telehealth) ja telelääketiede (telemedicine).

Avainsana	Telecare

Contents

1 Introduction

In the field of health care there has been an increasing interest for the benefits of telecare when developing the care of clients with long term health and social needs to be economical and of quality (Gaikwad & Warren 2009 cited in Sanders et al. 2012: 2). The United Nations claims that the number of elderly is increasing rapidly and projects that by 2020 this generation will be higher in number than the younger one (United Nations 2004 cited in While & Dewsbury 2011: 1302). In addition, people diagnosed with chronic illnesses are increasing in number as well (Stowe & Harding 2010: 193). According to Pountney (2009: 148), the current health care resources are inadequate for this on-going problem. Fortunately, rapid advancement in the development of technologies provide new ways to deliver health and social care and this problematic situation can be improved with the help of Information and Communication Technology (ICT) which can be defined as "a range of technologies which enable the exchange of data through the telephone or internet". (Pountney 2009: 148; While & Dewsbury 2011: 1302.)

Telecare is a tool using ICT that supplies services utilized by professionals to provide support to individuals with long-term conditions (Stowe & Harding 2010: 193). It allows them to live more independently and improves their quality of life (Dewsbury & Ballard 2013: 490). This is achieved with devices that monitor the individual's environment, their daily routines and their health condition. These devices are designed to maintain the individual's safety and to provide 24-hour assistance by alerting the professionals in case of any problem. (Nazarko 2007: 414.)

Describing what the practices are when using a technology such as telecaring in healthcare is important, because as Raapana and Melkas (2009: 5) claim, there are many examples of its wrong usage in elderly and patient care. There is a wide range of technologies now available on the market, but not enough resources are used when introducing them into the nursing field, therefore, professionals are not well educated and familiarized with these technologies. Furthermore, some studies have shown that the employees' well-being has weakened because of the usage of technology. (Raapana & Melkas 2009: 5, 6.) Raapana and Melkas (2009: 6) discuss that employees are not aware of the wide range of technologies available and what situations they are suitable for, thus they cannot have an impact on the decisions made

about the use of those technologies. Finally, the same authors (2009: 6) conclude that technology is only one part of the system and the decisions about its usage should always be done with taking into account the whole system.

The purpose of this final project is to describe what are the nurses' skills required in telecare. The aim of this project is to improve nursing practice in telecare.

2 Telecare

2.1 Definiton of telecare

The field of health care and social services currently benefits from telecare and other systems using ICT such as teleheath and telemedicine. The difference between these three terms is so far not clear, therefore, authors use them randomly in articles. This creates confusion when searching for information related to these terms. (Stowe & Harding 2010: 193.) Moreover, the terms telecare and telehealth are often used in parallel, however, it is important to note that they are two different systems (Pountney 2009: 148). Wanless (2006: 155) define telehealth "as the remote monitoring of vital signs such as temperature and blood pressure which can be used by medical professionals for diagnosis, assessment and prevention".

Telecare is defined as being "remote support services such as alarms or fall detectors" (Greenhalgh, Wherton, Sugarhood, Hinder, Procter and Stones 2013: 86). Finally, the World Health Organization defines telemedicine as being

> The delivery of health care services (…) using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, (…)(WHO 2010: 9).

According to Swann (2007: 516), telecare mostly benefits elderly clients as well as people diagnosed with chronic illnesses. The main goal of telecare is to support clients' independent living, as well as to improve their safety and well-being. Facilitating the work of health-care workers is considered as a secondary goal. (Raapana & Melkas 2009: 9.) The benefits of this service described by Wanless (2006: 156) include: the transfer of the client to a nursing home or to the hospital can be avoided or postponed, the discharge of an elderly client can be accelerated because the care can be

continued at home, hence resulting in hospital beds being free for other clients. Other advantages described by Swann (2007: 516) are that clients are able to choose different services provided by telecare for different needs. Accidents have also decreased and thus providing safety for the clients. (Swann 2007: 516.) Some believe that the disadvantage of using technologies such as telecare is that it might decrease the interaction time with the carer, hence increasing the feeling of loneliness especially in elderly clients. This argument is disputed by others saying that with these technologies the carer has more time and the resources are better managed, thus allowing more essential interactions. (Wanless 2006: 155.)

Ethical matters are to be taken into account when using telecare. The client's activities and daily life need to be monitored continuously for telecare to be efficient. It is important that clients' confidentiality is always maintained. (Pountney 2009: 151.) Clients must be educated about the monitoring devices, indeed some devices for example monitor clients when they are in the toilet or showering and this intrudes with their privacy (Swann 2007:516). Clients need to consent for telecare services, if they are not in a position to do so, their rights have to be considered (Nazarko 2007: 416).

Benefits of telecare on the nursing profession include first of all opportunities for nurses to allocate their time differently, thus resulting in more efficiency when providing care (Dewsbury & Ballard 2012: 424). With remote monitoring one nurse can care for more patients and the sharing of information is facilitated. The travel time for nurses when providing home-care is reduced. Despite the mentioned benefits, the effect of ICT usage on nursing profession and on the staff crucially needs more studying. (While & Dewsbury 2011: 1304, 1309.) Furthermore, the cost-effectiveness of telecaring is disputed by Stowe and Harding (2009: 197), asserting that there is a lack of studies reviewing the cost-effectiveness of this technology. For example, according to While and Dewsburry (2011: 1304), important financing will be needed to educate the professionals in order for them to become proficient in using ICT.

In this final project, telecare is defined as being a tool that utilizes ICT, more precisely remote support devices, that provides assistance to the elderly and individuals with chronic illnesses and therefore promotes their independence and well-being. It includes clients' environment monitoring devices such as alarms and detectors, but it does not include vital signs' remote monitoring used for diagnosis, treatment or prevention of diseases.

2.2 Devices

Swann (2007: 513) describes different devices that are used in telecare.
An active sensor works by detecting alerts and at the same time triggering an automatic response. Bed or mattress sensors are used to identify if a client is on the bed. It is possible to set a particular time for the sensors to be active for example at night. Cameras and video cameras monitor the clients in their homes. In case of gas leakage, a carbon monoxide monitor triggers a sensor. The chair monitor shows if the client is sitting and also it shows how long the client has been sitting for. The client can also be surveyed with the use of electronic tracking devices. The electronic tracking device uses GPS navigation system to allocate where the client is. (Swann 2007: 513.)

Fall monitors alert the call center if a client has fallen down. Flood detectors or water detectors are used to detect if there is extreme water flow, for example from the washing machines and bathtub. In case of fire, heat extremes detectors are used to alert the call center if there is a fast temperature rise. Smoke detectors trigger an alarm if the client's home has smoke. Temperature detectors are used to sense if the client's home temperature is too high or too low. Pressure pads placed under the door rug are used to inform the call center nurses if the client has left home. Tablet or pill dispensers are used to monitor the client's medication intake at the correct time. (Swann 2007: 513.)

According to Pragnell et al. (2000: 1),

> Smart Homes use electronic networking technology to integrate the various devices and appliances found in almost all homes (…) so that an entire home can be controlled centrally – or remotely – as a single machine.

The main characteristic in smart homes is that they have a single control system that combines different devices together using one remote control. Swann (2008: 274) explains that smart homes are designed according to the clients' personal requirements. The devices in the smart homes are set when to start and stop so as to meet the clients' requirements. All the devices in smart homes are connected together and perform according to the instructions given. The devices are manufactured with a battery system to be used in case of electricity failure. (Swann 2008: 274.)

Swann (2008: 275) continues with saying that smart homes are beneficial to clients who have difficulties switching on or off the lights, opening windows, doors, fridge, and so on due to an illness. Some clients are at risks of falls, gas leakage, fire, seizures

and the smart homes provides the safety needed by alerting the call center in case of accidents. Alarms are used in smart homes to alert the client if someone is at the door and also voice messages can be left for the client in case she/he is not home. An alert is triggered either by smoke, fire, flood, carbon monoxide sensors which then alerts the call center. Programmed messages can be received in a mobile phone when an alert has been triggered. (Swann 2008: 275.)

Telephones or mobile phones are also used as telecare devices where the client can receive information from nurses or family members. Pictures of the nurse or family members can also be installed to help the client's memory. Window can open automatically if there is for example something burning or if the air is too condensed, then the windows close after some time or if the client leaves home. The client is also able to find items in the house by triggering a sound system that is attached to the items, for example keys. Computerized devices using prompts are used to help clients who struggle with their day-to-day activities. (Swann 2008: 275.)

One good example that Swann (2008: 275) gives, is a bathroom that has a computer screen that gives visual and audio guidance that helps the client in case of disorientation when washing hands. Finally, there are sensors for example in the bathroom that turn the water off after it has reached a certain level in the bathtub or sink. In addition, when the client leaves a room, the light sensor turns off the lights to save on power and also to track where the client is located. (Swann 2008: 275.)

2.3 Nurses' skills in telecare

A skill is defined as

> "An ability and capacity acquired through deliberate, systematic, and sustained effort to smoothly and adaptively carryout complex activities or job functions involving ideas (cognitive skills), things (technical skills), and/or people (interpersonal skills)" (Business dictionary 2014)

The use of technology in healthcare is bound to cause some changes in the way nurses work and it requires them to learn new skills (Raapana & Melkas 2009: 16). As While and Dewsbury (2011: 1304) stated, skills required for good application of telecare are ICT and remote communication skills. In addition, nurses should have good assessment and decision making skills to determine the need and goals of telecare for a specific client (Raapana & Melkas 2009: 15). The nurses have an

important role when choosing the device that is the most appropriate for their clients (Horton 2008: 177). Furthermore, Dowding (2013: 35) claims that nurses need information management skills for them "to be able to collect, analyse and report data to carry out audit or contribute to service improvement". In another word, nurses need to become active in designing and managing the system. (Forbes & While 2009 cited in While & Dewsbury 2011: 1309.) Finally, telecare demands from nurses to be able to work in collaboration with other professionals (Horton 2008:178).

3 Study question, purpose and aim of the final project

The purpose of this final project is to describe what are the nurses' skills required in telecare. The aim of this project is to improve nursing practice in telecare. The study question is: What are the nurses' skills required in telecare?

4 Methodology and Database search

4.1 Literature review

The research method used in this final project is a literature review. This method has been traditionally used in health care literature (Hemingway & Brereton 2009: 2). This method seeks to review relevant literature in order to gain the information on what is known and unknown about a specific topic (Burns & Grove 2003: 55). The method as described by Aveyard (2010: 6) is essentially to find a research question that will be answered after "searching for and analysing relevant literature using a systematic approach". The process of how the review was done needs to be clearly documented by the writer so that the literature review can be accepted as a research methodology in its own right (Aveyard 2010: 19).

Literature review is considered as a research method of its own in health and social care and has become important because of the increasing need of evidence-based knowledge (Aveyard 2010: 2). Aveyard (2010: 6) says that literature reviews are useful for health and social care workers because they provide a summary and an analysis of the existing literature. It helps the health and social care workers to fulfill their professional duty of continuously educate themselves without them having to go through the important volume of literature that exists in this field (Aveyard 2010: 6).

4.2 Data collection

Electronic database searches were conducted using the databases Cumulative Index of Nursing and Allied Health Literature (CINAHL) and Medline. The reason for using CINAHL is that it contains an extensive amount of international literature about nursing (Aveyard 2010: 76). Medline offers as well a large amount of references in the field of life sciences (U.S National Library of Medicine 2013). As Riesenberg and Justice (2014: 16) state, at least two databases should be used for a literature review, in addition reading through the references of books and journal articles may be useful in order to obtain relevant literature.

The database searches were done during the spring 2014. Manual searches using the reference list of research articles were also used in order to obtain more relevant articles for the review. The search term used is Telecare. The limitations were articles written in English and articles published between the years 2008-2013, in order to obtain the latest researches on the topic. Only articles relevant to the topic and that provided an answer to the research question were selected. The inclusion criteria were research articles limited to the topic of telecare and that had the same definition of telecare as used in this final project, written in English and published between the years 2008-2013.

As described in Table 1., searches were conducted on both Cinahl and Medline databases using the same search term. Articles were first selected with the relevance of their titles, and then the final selection was done after reading through the whole text, to ensure that the articles suited the inclusion criteria. The searches resulted in one article selected from Cinahl, four articles were selected from Medline and one article was selected through a manual search. In total, six articles were selected for the literature review.

Table 1. Database search

Date	#	Database	Search terms	Limitations	Results	Articles selected by title	Article selected by whole text
5.2.14	1	Cinhal	Telecare	2008-2013 English	104	13	1
5.2.14	2	Medline	Telecare	2008-2013 English	627	11	4
25.2.14	3	Manual search		2008-2013 English			1

4.3 Data analysis

The data were analysed using the principles of content analysis.

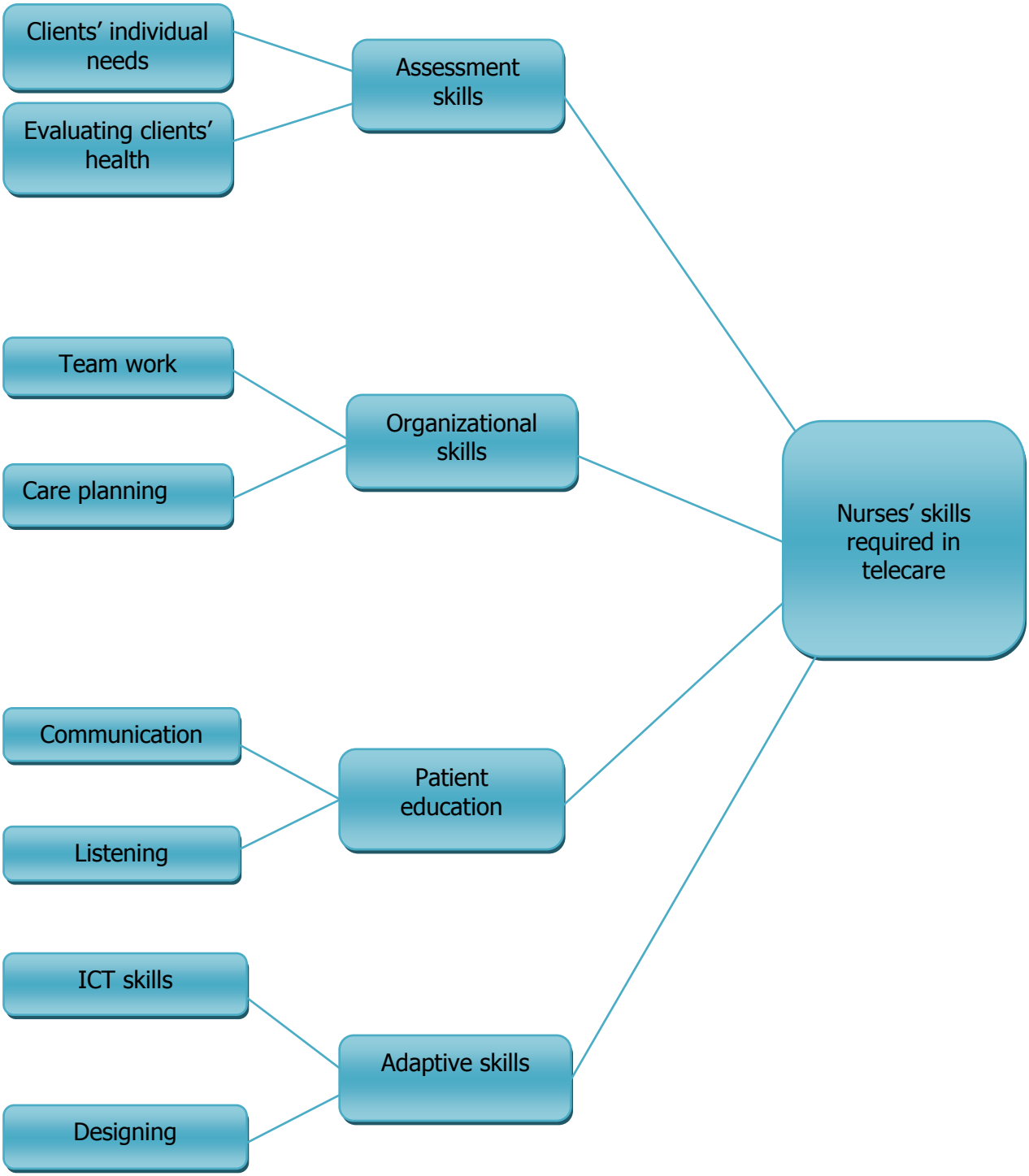
> Content analysis is a research method that is used to make replicable and valid inferences from data to their context with the purpose of providing knowledge, new insights, a representation of facts and a practical guide to action (Krippendorff 1980 cited in Elo & Kyngäs 2007: 108).

According to Elo and Kyngäs (2007: 113), content analysis is used in studies done in nursing. It is used to analyze the data in nursing that are complex and phenomena. Content analysis helps to understand the data by testing the theoretical part. Words or phrases that have the same meaning are classified. (Elo & Kyngäs 2007: 108.) Elo and Kyngäs (2007: 113) state that, inductive content analysis is used when there are not enough studies done that deals with topics or when the knowledge is fragmented. Inductive content analysis contains three phases as explained by Elo and Kyngäs (2007: 109): the preparation phase, the organizing phase and the reporting phase.

The principles of inductive content analysis were used in this final project. The six research articles that were selected are summarized in Appendix 1. The articles were divided between the authors before the data analysis phase. The data of the articles were defined during the preparation phase by re-reading the results and discussion section of the articles. In the organizing phase, the articles were then re-read and categories were formed according to similar recurring themes that answered the study question. These categories were titled and organized into four main categories and then divided into eight sub-categories as shown in figure 1. In the final phase, the results were reported.

5 Results

Figure 1. Results according to categories



Four categories were formed and then divided into eight subcategories, which in turn illustrate nurses' skills required in telecare.

5.1 Assessment skills

Clients' individual needs

Before introducing telecare to clients, nurses should take into account clients' current health condition and how they are adapting to their illness (May et al 2011: 9).
A study from Milligan et al. (2011: 353) has demonstrated that there is more need to tailor telecare devices according to the condition of the client. For example, Milligan et al. (2011: 353) discuss that conditions such as dementia followed with memory loss have an effect on how telecare devices are used, therefore this should be taken into consideration from nurses when planning telecare to elderly suffering from these conditions. Finally, the elderly's social, emotional and medical needs must be addressed by the nurse and understanding the environment where the telecare systems are being placed is also meaningful (Milligan et al. 2011: 351).

The findings of a study from Sanders et al. (2012) also agree with what was discussed in the study from Milligan et al. (2011: 351, 353). Sanders et al. (2012: 9) state that when implementing telecare with new clients, nurses should give attention to tailoring the devices according to the situation of clients and depending on their own view of their self-management, as one device could fit one client's need but at the same time it might not fit some other client's need who has the same long-term condition. For example, Sanders et al. (2012: 5) raise the problem of language when using telecare devices. In their study, it was found out that people would refuse participating to a trial with telecare devices because the language used in the devices was not a language that they felt comfortable using (Sanders et al. 2012: 5). Conclusion can be drawn from this that the language used to operate telecare devices should be individually set for every client.

As Perry et al. (2011: 69) emphasizes, clients who use telecare should chose and control what kind of services they want and it should not be imposed on them. May et al. (2011: 7) also emphasize the importance of telecare matching the clients' individual needs and at same times highlighting that it should be flexible so as the clients can chose what they want.

Evaluating clients' health

A study by Pols (2010: 385) revealed that nurses needed to learn new ways to manage with absent senses such as sight when dealing with clients during telecare. For example, to remotely evaluate clients' current health, nurses had to learn to ask the specific questions about what they would like to know about their clients' health. In a situation without using telecare, the nurses would assess by observing the client during a traditional home visit where they actually meet the client in person (Pols 2010: 379).

Pols (2010: 378) also claims that in order to provide good nursing care, nurses needed sometimes to be flexible when interpreting the different signals that the telecare devices were sending them. In order to evaluate the patient's health they sometimes had to ”correct” the information the devices provided them, always keeping in mind the individual context of the client (Pols 2010: 385). The nurses' goal was to give an individualized care; therefore they went around the good standards of devices' use when they felt it was appropriate with particular clients (Pols 2010: 378).

5.2 Organizational skills

Team work

Milligan et al. (2011: 352) discuss that good collaboration between clients, formal (e.g nurses) and informal (relatives) carers, friends, neighbors and emergency services is important for good implementation of telecare. In relation to this same topic, May et al. (2011: 9) claim that some of the health care professionals (e.g nurses) do have good relationship with the telecare suppliers, while other health care professionals do have problems with the suppliers not being more engaged. Telecare implementation barriers arise due to lack of engagement from the suppliers. The need of more dialogue between health care professionals, suppliers, and manufacturers would help to implement telecare. Manufacturers of telecare devices also feel that health care professionals lack clear business models to implement telecare in practice. (May et al 2011: 9)

Care planning

Nurses feel like telecare is replacing human contact (Engström et al. 2009: 785). According to some nurses, telecare can be seen as a negative way of caring and it is sometimes seen as impersonal and that it would lead to no human contact (Engström et al. 2009: 787). Milligan et al. (2011: 350) agree that telecare can potentially enhance the quality of life of the elderly, but on the other hand concerns are raised about decreased social contacts and clients' isolation. Therefore, when planning clients' care, nurses should consider this technology more as a support that comes in addition to human care than something that comes as substitute to it (Milligan et al. 2011: 353). Milligan et al. (2011: 350) also advise nurses to view telecare as a help and not simply as an answer to increasing needs of care.

According to a study from Sanders et al (2012: 10) when organizing telecare interventions to a client's home, should the nurses plan the care so as to integrate telecare as one component of the current regular services, this eases the adoption of this new technology. The existent relationship between the client and the service provider, for example the nurse, should be still maintained while telecare devices are in use (Sanders et al. 2012: 10).

5.3 Patient education

Communication

The importance of communication during home visits when organizing telecare implementation is discussed in a study from Sanders et al. (2012: 10). Clients did not feel that their concerns were taken into consideration during this visit. This showed that the way the information on telecare devices is communicated and discussed with the client affects his/her decision to accept telecare interventions. When introducing telecare devices for the first time to a client's home, nurses should give thorough information and allow time for discussion with the client. (Sanders et al. 2012: 10.)

When installing telecare systems to the client's home, it is crucial that nurses should ensure that the client and his or her care-giver have a good understanding of the purpose of the devices and of how they should be operated. This therefore guarantees

the correct use of these devices (Milligan et al. 2011: 350). May et al. (2011: 6) support what Milligan et al (2011: 350) said, that because nurses do not have enough knowledge about telecare this results to clients being confused about the purpose and the use of the devices. In addition, clients are not well informed of how the telecare devices would affect their home environment and maybe also interfere with the other devices at home, for example television (May et al 2011: 7).

Listening

Clients know better their own conditions and they should be able to choose and pick telecare devices according to their personal needs. Nurses should consult and actively include the client in the decision making process. (May et al. 2011: 7.) Milligan et al. (2011: 351) also bring to the attention that the elderly should be encouraged to participate in discussions about telecare systems and to the further development of these devices, in order that such technologies that genuinely support their aging could be developed. Before installing new telecare devices to clients' home, the nurse should listen to the client’s expectations, concerns about the new technology and about the coming changes that telecare brings to the social and health services the client had before (Sanders et al. 2012: 11).

5.4 Adaptive skills

ICT skills

Some nurses have difficulties when it comes to using telecare devices and mostly because they have insufficient knowledge about telecare devices. Other nurses do not know how different telecare devices work and function. (Engström et al. 2009: 787.) In addition, some nurses experienced difficulties while using computers because they lacked knowledge about handling them (Engström et al. 2009: 786). Nurses need time to learn and practice the new ICT used in telecare (Engström et al. 2009: 788).

Designing

Implementation and integration of telecare would work better if nurses had an opportunity to be able to select and design telecare devices specifically geared with the clients' own context and aim (May et al 2011: 7). Sanders et al. (2012: 11) suggest that a stronger link between the design of the technology and the evaluation of it is needed in order to utilize these observations to further develop the design and implementation of new telecare devices. Milligan et al. (2011: 351) state that when designing and implementing new technologies, nurses should "take seriously older people's ongoing and ever-changing needs for meaningful human interaction". It seems that currently telecare devices do not attend to problems such as social isolation, recognition the level cleanliness of the client's house or recognition of the correct or incorrect use of the device (Milligan et al. 2011: 351).

6 Discussion

6.1 Discussion of the results

The results from our literature review correlate with the existing knowledge about telecare and the nurses skills described earlier in this final project. New skills are needed from nurses in order to use telecare efficiently, therefore clients would benefit from it. The results of this literature review show that these skills are assessment skills, organizational skills, patient education skills and adaptive skills. Horton (2008: 177) stated that nurses play an important role when choosing the appropriate telecare devices for their clients. The results from this literature review showed that clients' individual needs should be assessed by the nurses when planning telecare services to them. The devices should also comply with clients' health situation. Nurses have to learn to remotely evaluate clients' health condition, since there is no face to face contact with them.

Team work and care planning are organizational skill needed from nurses. Horton (2008: 178) claims that telecare demands from nurses to be able to work in partnership with other professionals. The results from this literature review also revealed that nurses' team work skills are crucial for the good implementation of telecare and to ensure clients' smooth transition to telecare services. Nurses have to be able to work

with different professionals such as telecare suppliers and devices manufacturers (May et al. 2011: 9). The fear of telecare replacing human contact is predominant throughout the literature. This literature review revealed that there are some ways to avoid this from happening. Nurses should see and be able to plan the care as such that telecare is an additional support that is integrated as one component of the whole client care and not as something that would replace human care (Milligan et al. 2011: 353).

The results emphasized that nurses need to educate clients about telecare, thus requiring them to have good communication and listening skills. They need to educate the client about the purpose of the devices and how they are operated. Some results revealed that nurses sometimes lack the knowledge about different kinds of telecare devices and about how to operate them, this could be improved with providing nurses with a better training and giving them time to learn and practice the new ICT used in telecare (Engström et al. 2009: 788). In addition, the results stressed that nurses should have the skill to listen to their clients' fears and expectations about the new technology being introduced to their home, this could therefore ease the implementation of telecare. Nurses have to involve clients in the decision making process when it comes to choosing and implementing telecare (May et al. 2011: 7).

It is required from nurses to have adaptive skills in order to learn about different devices and how to use them. The results revealed that there is a need from nurses to learn different ICT skills needed in telecare, such as how to use a computer. Employers should offer to nurses more training in this area and thus increasing their knowledge about telecare, which then makes them better educators. Additionally, the results emphasized the importance of nurses being part of designing telecare devices so as to design devices that are more suited to each clients' own context and aim (May et al. 2001: 9). These results can be linked to what Forbes and While (2009 cited in While & Dewsbury 2011: 1309) have stated that nurses need to become active in designing and managing telecare.

There were difficulties to find articles for this literature review that only studied telecare devices as defined in this final project. This correlates with the current problem that there is confusion between the definition of the terms telecare, telemedicine and telehealth. Many articles were not used in this review because either telehealth and telecare devices were mixed or the definitions of these terms were not clear.

The results from this literature review can be used to further improve nursing practice in telecare in Finland. Nurses would need more training in ICT skills and general training about what devices are available and how they are operated. When nurses know more about telecare it leads to a better communication between the nurses and the clients. The nurse-client relationship would improve, whereby the client is assured that telecare is not replacing nurses and vice versa the nurses would feel that they are able to provide good quality care while using telecare. It is clear that more studies about nurses' skills required in telecare are needed. Currently, many researches about telecare study only clients' experience and the devices. There is also need for more studies that would clearly define telecare, telehealth and telemedicine.

6.2 Discussion of the validity

In order for a study to have valid conclusions that can develop nursing theory and evidence-based practice, the measurement instrument must be valid (LoBiondo-Wood & Haber 2006: 336). According to Aveyard (2010: 104,105), when evaluating the validity and reliability of a quantitative study the quality of the journal of publication, the method, the sample size, the data collection method and the data analysis method must be analysed. In addition, the author must be considered when evaluating qualitative studies (Aveyard 2010: 111). According to Graneheim and Lundman (2004 cited in Elö & Kyngäs 2008: 112), "the researcher should give a clear description of the context, selection and characteristics of participants, data collection and process of analysis".

The validity of this final project is ensured because the authors selected the articles by analyzing the quality of the journal, the sample size and according to our inclusion criteria. Both of the authors read through all the selected articles before the data analysis phase. However, due to time constraints, the selected articles were divided between the authors for the data analysis phase. A clear description of data collection and data analysis was reported in this final project. Even though Elö and Kyngäs (2008: 112) recommend using appendices and tables to illustrate the connection between the data and results, due to time constraints this has not been done.

6.3 Discussion of the ethical considerations

As Burns and Grove (2003: 187) describe, the aim of a research which is to produce thorough scientific knowledge can be achieved only with “honest conduct, reporting and publication of quality research”.

When reading and selecting articles, it is important to examine the ethical rigor of the research. The researcher must recognize and discuss the ethical considerations related to his/her study. (Burns & Grove 2003: 430.) It is important as well to pay attention to scientific fraud and misconduct. This may include falsified or fabricated data or patients that have been compelled to participate to a study. (Tilden 2000 cited in LoBiondo-Wood & Haber 2006: 307.) Other examples of dishonesty in research are manipulation of design or methods, manipulation of data and plagiarism (Burns & Grove 2003: 187). Values such as accountability, mutual respect, trust and fairness should be followed during research where often collaboration between people and team work is required (Resnik 2011). Finally, researchers should seek for advices from an external person to evaluate the ethical aspects of a research (Polit & Beck 2004: 159).

For this final project, the findings from the research articles were described accurately, without falsification or fabrication. The sources were correctly cited in the text and listed in the reference list following the Metropolia University of Applied Sciences Guidelines for Writing Papers. Finally, advices and guidance from an external person were followed during the whole process of this final project.

References

Anguita, M. (2012) Opportunities for nurse-led telehealth and telecare. *Nurse Prescribing,* 10 (1), 6-8.

Aveyard, H. (2010) *Doing a literature review in Health and Social Care. A practical guide.* Maidenhead: Open University Press.

Bradley, D.A., Williams, G., Brownsell, S.J. and Levy, S. (2002) Community alarms to telecare- The need for a systems strategy for integrated telehealth provision. *Technology and Disability,* 14, 63-74.

Burns, N. and Grove, K.S. (2003) *Understanding Nursing Research.* Philadelphia: Saunders.

Dewsbury, G. and Ballard, D., (2012) Is your home telecare aware? *Nursing & Residential Care,* 14 (8), 422-424.

Dowding, D. (2013) Are nurses expected to have information technology skills? *Nursing Management,* 20, 31-37.

Elo, S. and Kyngäs, H. (2008) The qualitative content analysis process. *Journal of Advanced Nursing* 62(1), 107–115.

Engström, M., Lindquvist, R., Ljunggren, B. and Carlisson, M. (2009) Staff members' perceptions of a ICT support package in dementia care during the process of implementation*. Journal of Nursing Management*, 17, 781–789.

Greenhalgh, T., Wherton, J., Sugarhood, P., Hinder, S., Procter, R. and Stones, R. (2013) What matters to older people with assisted living needs? A phenomenological analysis of the use and non-use of telehealth and telecare. *Social Science & Medicine* 93, 86-94.

Hemingway, P. and Brereton, N. (2009) What is a systematic review? What is...? series 1-8.

LoBiondo-Wood, G. and Haber, J. (2006) *Nursing research, Methods and Critical Appraisal for Evidence-Based Practice.* St-Louis: Mosby Elsevier.

May, R.C., Finch, L.T., Cornford, J., Exley, C., Garely, C., Kirk, S., Jenkings, N.K., Osboume, J., Robison, L.A., Rogers, A., Wilson, R. and Mair, S.F. (2011) Integrating telecare for chronic disease management in the community: What needs to be done? *BMC Health Services Research* 11(131),1-11.

Milligan, C., Roberts, C. and Mort, M. (2010) Telecare and older people: Who cares where? *Social Science & Medicine* 72, 347-354.

Nazarko, L. (2007) Independence through telecare. *Nursing & Residential Care,* 9 (9), 414-416.

Oxford Dictionnaries 2013 <http://oxforddictionaries.com/definition/english/competent?q=competent> Read 30.09.2013

Perry, J., Firth, C., Puppa, M., Wilson, R. and Felce, D. (2011) Targeted Support and Telecare in Staffed.Housing for People with Intellectual.Disabilities: Impact on Staffing Levels and Objective Lifestyle Indicators. *Journal of Applied Research in Intellectual Disabilities* 25, 60–70.

Pols, J. (2010) The Heart of the Matter. About Good Nursing and Telecare. *Health Care Analysis*. 18, 374-388.

Pountney, D. (2009) Telecare and telehealth: enabling independent living*. Nursing & Residential Care,* 11 (3), 148-151.

Pragnell, M., Spence, L. and Moore, R. (2000) *The market potential for Smart Homes*, York: York Publishing Services Ltd.

Raapana, A. and Melkas, H. (2009) *Teknologian hallittu käyttö vanhuspalveluissa. Opas teknologiapäätösten ja teknologian käytön tueksi.* Lahti: Lahti School of Innovation.

Resnik, D. B., (2011) What is Ethics in Research & Why is it Important? Internet document <http://www.niehs.nih.gov/research/resources/bioethics/whatis/> read 07.05.2014

Riesenberg, L.A. and Justice, E. M. Conducting a sucessful systematic review of the literature, part 1. *Nursing 2014,* 13-17

Sanders, C., Rogers, A., Bowen, R., Bower, P., Hirani, S., Cartwright, M., Fitzpatrick, R., Knapp, M., Barlow, J., Hendy, J., Chrysanthaki T., Bardsley, M. and Newman, S.P. (2012) Exploring barriers to participation and adoption of telehealth and telecare within the Whole System Demonstrator trial: a qualitative study. *BMC Health Services Research*, 12 (220), 1-12.

Stowe, S. and Harding, S. (2010) Technology applied to geriatric medicine Telecare, telehealth and telemedicine*. European Geriatric Medicine,* 1, 193-197.

Swann,I.J. (2008) Smart Homes: intelligent buildings*. International Journal of Therapy and Rehabilitation*, 15 (6) 273-278.

Swann,I.J. (2007) Telecare: Looking to the Future. *International Journal of Therapy and Rehabilitation*, 16 (11) 512-517.

U.S National Library of Medicine (2013) Internet document <http://www.nlm.nih.gov/pubs/factsheets/medline.html> read 06.12.2013

Wanless, D. (2006) *Securing good care for older people. Taking a long-term view.* London: King's Fund.

While, A. and Dewsbury, G. (2011) Nursing and information and communication technology (ICT): A discussion of trends and future directions. *International Journal of Nursing Studies,* 48 (10), 1302-1310.

World Health Organization (2010) *Telemedicine. Opportunities and developments in member states. Report on the second global survey on eHealth.* Geneva: WHO Press.

Appendices

Framework for Analysing Research Data

Title of the Articles	Authors, year and where the study was conducted	Purpose	Participants (Sample size)	Data collection and analysis	Main results	Remarks
Staff members' perceptions of a ICT support package in dementia care during the process of implementation	Engström et al.; 2009; Sweden	To describe staff members, perception of an information and communication technology (ICT) support during the process of implementation	14 participants who are staff members	Qualitative content analyses, Interviews and grouped in categories.	Two main themes: 1. The change of losing control to perceived increase in control and security. Some staff members thought it was in human, unrealistic, crazy and waste of money to install ICT in residents' homes and other staff thought it was exciting, a positive thing for them and the residents and wished for further development. 2. The struggle of insufficient/deficient systems. The ICT had some faults and some staff members could not trust the	Telecare had many advantages than disadvantages and there is still area for improvement both in clients' care and staff's working situation.

					devices. Some staff did not have enough knowledge about some of the devices.	
Integrating telecare for chronic disease management in the community: What needs to be done?	May et al.; 2011; England and Scotland	To identify factors inhibiting the implementation and integration of telecare systems for chronic diseases management in the community	221 participants who consisted of health professionals and managers, patients and carers, social care professionals and managers and services suppliers and manufactures.	Qualitative data interviews, task-groups and workshops. Normalization Process Theory.	Barriers to telecare were: Uncertainties about coherent, sustainable and business models. Social and primary care had no boundaries. Not enough funds to have primary care services and telecare. Patients took care of themselves because previous care services were discontinued. Doubtfulness about capability of telecare devices. Poor policy and practice of telecare were led by the above mentioned problems.	Lack of enough understanding of telecare devices. There is need for intervention between health and social care agencies so as to promote client centred care rather than care based on biomedical/service-centred models.
Telecare and older people: Who cares where?	Milligan, C., Roberts, C., Mort, M.; 2010; UK.	To find out first, older people's perceptions of telecare and care interactions within their home; second, find out how new care	1. sixty practitioners, policy-makers architects, researchers, designers and telecare providers.	1. Themed and recorded discussion groups. Data transcribed, summarised and analysed thematically.	Some telecare technologies (the ones seen by older people as being enabling and which promotes their own decision making) possibly could enrich their lives and are seen as positive, especially when	This research utilizes two consecutive European Community funded studies undertaken over the last four years

		technologies could be partly responsible of a remodeling of the nature and place of care and care-work.	2. between 8 and 10 older people grouped in 8 panels (Total about n=80) and 10 key actors from social care services and telecare design companies.	2. Recorded interviews and observational visits (field notes). Data transcribed, analysed thematically	physically coping with daily life becomes difficult. Telecare must be viewed as a resource that should be in addition to and not as a substitute to human care and support. The limit between home and institution is blurry when telecare devices such as sensors and webcams are used for surveillance and monitoring.	(2006-2010)
Targeted Support and Telecare in Staffed Housing for People with Intellectual Disabilities: Impact on Staffing Levels and Objective Lifestyle Indicators	Perry et al., 2011; United Kingdom	To evaluate the quality of life with less intensive staff intervention as an outcome from the introduction of more staff	91 participants 50 men and 41 women and the average age was 47	Data was collected 4 times within 2 years. Staffs were interviewed using the Residential Service Setting Questionnaire. Analysis: Comparing Pre-1 and Pre-2 Categorical data and the chisquare McNemar test	There was no change in the staff working methods but 23% of staffing levels were reduced. Most of participants got there income from the state benefit. In social and community activity, independence and choice, safety and home likeness there were no significant differences or changes. .	There was no adverse short-term affect with the use of telecare and targeted support on the participants but they did reduce the staff input so in one way or another they did play a role the strategic development of adults with intellectual disabilities.

The Heart of the Matter. About Good Nursing and Telecare	Pols, J. ; 2010; Netherlands	To analyze whether the worries about telecare leading to the neglect of patients, and possibly preventing the development of a personal relation between nurse and patient are justified	9 specialized nurses, 33 patients, 4 medical specialists, 13 telecare managers, 2 volunteers, 3 technicians and 2 producers (Total 93)	Interviews, content analysis, tracing norms and notions of 'good nursing' and their tensions	The practice of telecare does not lead to any negligence or compromised nurse-patient relations. In the contrary, the use of telecare allows more frequent and specialized contact between the nurse and the client.	The article reflects at end on the ethical implications of the changes that telecare brings to nursing practice
Exploring barriers to participation and adoption of telehealth and telecare within the Whole System Demonstrator trial: a qualitative study	Sanders, C. et al.; 2012; UK	To explore barriers to participation and adoption of telehealth (TH) and telecare (TC) from the perspective of people who refused to participate or retracted from a randomised controlled trial trial.	22 people who refused to participate to the trial (n=19) or who retracted themselves from the intervention arm (n=3)	Qualitative semi-structured interviews and observational visits (field notes)	Barriers to adoption of TC and TH are linked to the worries about technical competences being required to operate the devices as well as self-care, identity and independence being threatened. Finally, the fear that existing services would be interrupted.	Important issues with policy implications were raised through this study, when it comes to the insistence about the implementation of TC and TH