LAB University of Applied Sciences

Preventing the Spread of MRSA in Home Care

LAB University of Applied Sciences
Bachelor´s Degree Programme in Nursing
2021
Iida, Ruotsalainen

Abstract

Author	Publication type	Published
Ruotsalainen, Iida	Thesis, UAS	2021
	Number of pages	
	36	

Title of Publication

Preventing the Spread of MRSA in Home Care

Degree and field of study

Bachelor´s Degree Programme in Nursing

Name, title and organisation of the client

Keskusta home care, Päijät-Häme Joint Authority for Health and Wellbeing, PHHYKY

Abstract

The thesis work focused on the topic of preventing the spread of MRSA in home care. The thesis was implemented as a practice-based thesis, thus creating of a product was carried out. The product of the thesis was an educational video for home care nurses with instructions on how to appropriately apply asepsis and hygiene protocols in the home care environment. This promotes preventing MRSA from spreading among clients of home care and employees of home care including nursing staff and other social and health care professionals. The educational video also provided basic information on MRSA and justified why certain hygiene protocols are important to follow when caring for clients carrying MRSA. The video also briefly explored some of the negative impacts MRSA can have on humans carrying the bacteria as well as the more large-scale impacts it has on the field of health care. The educational video was presented to the commissioning party, Keskusta home care of PHHYKY. The video was also assessed by a hygiene nurse of PHHYKY.

The thesis work included a written part, which was written according to thesis guidelines utilising evidence-based research and studies collected from reliable sources. The knowledgebase included general information on MRSA, what it is and what kind of impacts it has in the field of health care. The thesis also explored home care as a nursing environment from the nursing point of view. The aim of the thesis was to create an educational video and the purpose was to promote the knowledge of home care nurses on MRSA.

The practice-based thesis followed the framework of the linear model. Thematic analysis was utilised to analyse the feedback data collected after the video presentation at the headquarters of Keskusta home care. The topic of the thesis is seen important and essential. The educational video is found useful in the home care environment and will be utilised for educational purposes.

Keywords

MRSA, home care, prevention, infection control

Tiivistelmä

Tekijä	Julkaisun laji	Valmistumisaika
Ruotsalainen, Iida	Opinnäytetyö, AMK	2021
	Sivumäärä	
	36	

Työn nimi

MRSA:n leviämisen ennaltaehkäisy kotihoidossa

Tutkinto

Sairaanhoitaja (AMK)

Toimeksiantaja

Keskustan kotihoito, Päijät-Hämeen hyvinvointiyhtymä, PHHYKY

Tiivistelmä

Opinnäytetyö käsitteli aihetta MRSA:n leviämisen ennaltaehkäisy kotihoidossa. Opinnäyteyö toteutettiin toiminnallisena opinnäytetyönä, täten laadittiin myös tuote. Opinnäyteyön tuote oli opetusvideo kotihoidon hoitajille, joka sisältää ohjeistuksen miten toimitaan hygieenisesti ja aseptisesti oikein kotihoidon ympäristössä jotta ennaltaehkäistään MRSA:n leviäminen kotihoidon asiakkaiden ja hoitohenkilökunnan keskuudessa. Opetusvideo välittää myös perustietoa MRSA:sta ja perustelee miksi tiettyjä hygieniakäytäntöjä on tärkeä noudattaa kun hoidetaan MRSA:ta kantavia asiakkaita. Videossa käydään myös lyhyesti läpi MRSA:n negatiivisia vaikutuksia ihmisiin sekä terveydenhuoltoon. Opetusvideo esitettiin toimeksiantajalle, PHHYKY:n Keskustan kotihoidolle. Opetusvideo arvioitiin myös PHHYKY:n hygieniahoitajan toimesta.

Opinnäytetyön kirjallinen osuus tuotettiin noudattamalla opinnäyteyön tekemisen ohjeita. Näyttöön perustuvaa tietoa ja tutkimusta kerättiin luotettavista lähteistä kirjallista osuutta varten. Tietoperusta sisälsi yleistä tietoa MRSA:sta ja vastaa kysymyksiin, mikä se on ja miten se vaikuttaa terveydenhuoltoon. Opinnäyteyössä myös käsitellään kotihoitoa sairaanhoitoympäristönä hoitajan näkökulmasta. Opinnäytetyön tavoite oli laatia opetusvideo ja tarkoitus edistää kotihoidon hoitajien tietämystä MRSA:sta.

Toiminnallinen opinnäytetyö noudatti lineaarista mallia runkona ja viitekehyksenä. Teemoittelua hyödynnettiin videosta saadun palautteen analysoinnissa videon esittelyn jälkeen. Tämä aihe koetaan tärkeäksi ja oleelliseksi. Opetusvideota pidettiin hyödyllisenä kotihoidossa ja sitä tullaan hyödyntämään opetustarkoituksessa.

Asiasanat

MRSA, kotihoito, ennaltaehkäisy, infektioiden torjunta

Contents

Appendices

1 Introduction

The world Health Organization states that antimicrobial resistance (AMR) threatens global public health. Methicillin-resistant Staphylococcus aureus (MRSA) is a bacterium resistant to certain antimicrobial drugs. Antibiotics are important in health care as they play a large role in ensuring surgeries and chemotherapy are successful along with treating infections. If antibiotics became ineffective due to antimicrobial resistance, many resources of health care and treating illness would be compromised thus threatening human lives in the worst-case scenario. WHO urges all government sectors and societies to take action in preventing AMR. MRSA and AMR in general cause higher costs not only for the field of health care, but patients as well due to prolonged illness and hospital stays, extra testing and requiring more costly drugs for treatment. Antimicrobial resistance for example MRSA, is caused by excessive use of antimicrobial drugs, as the microorganisms (bacteria, viruses, fungi and parasites) are exposed to the drug and transform, thus building a resistance towards the drug. (WHO 2021.)

Nurses encounter and take care of MRSA-carrying patients in different health care environments, such as hospitals, nursing homes and home care. Preventing the spreading of MRSA in health care environments is important, as it could be fatal for critically ill patients. Hospitals, nursing homes and other in-patient care environments mostly have strict regulations on how to prevent MRSA from spreading. An example of a method used in hospitals is first caring for “clean” patients and lastly the patients carrying antibiotic-resistant bacteria, if the situation allows. However, this model is not possible to implement in the home care setting. The prevention of the spreading of MRSA is important in the home care setting, but how is it implemented? (Kolho et al 2020.)

According to the statistics of Duodecim, the prevalence of MRSA in Finland includes approximately 1300-1700 new cases of MRSA a year. The MRSA bacteria have become more uncommon in the northern countries of Europe. This beneficial phenomenon is a result to moderate use of antibiotics and successful prevention measures. The bacteria can be found in humans of all ages and there are regional differences in the prevalence of the bacteria. The most common source of MRSA transmission takes place in hospitals and other health care facilities up to approximately 70% of all cases. Transmission of MRSA is also possible outside of hospitals and an estimate of 10-20% of the cases originate from abroad. (Anttila 2020a.) According to Larsson et al, the European Center for Disease Prevention and Control, ECDC, has estimated the number of deaths resulting from antibacterial resistance is approximately 25 000 in the European Union a year. Additional costs in the EU caused by antimicrobial resistance are estimated to be 900 million euros yearly. (Larsson et al 2018.)

MRSA has been known as a hospital “superbug” due to its resistive features towards antibiotics causing different types of infections ranging from mild skin infections to severe septicaemia. MRSA, short form for Methicillin-resistant Staphylococcus aureus is a common bacterium capable of spreading via skin contact from one person to another. MRSA has terrorized hospitals and other health care environments by causing unnecessary infections in patients and residents as well as being a financial burden bringing significant additional costs to the field of health care. Though MRSA has been known for over five decades, it became known as a serious and concerning issue less than three decades ago. In order to prevent this bacterium from impacting health care and human lives negatively, preventive protocols and measures have been found to promote the prevention of MRSA. (McArthur 2010.)

Today, there is plenty of research studies available regarding MRSA. However very little research is available on how MRSA affects the home care environment as most studies are conducted in hospital and nursing home settings. To clarify the prevention of the spreading of MRSA in home care protocol, the aim of this thesis is to create an educational video for home care nurses on the topic. The purpose of this thesis is to promote the knowledge of home care nurses on how to appropriately apply asepsis with MRSA-carrying clients in home care. This will also promote the work safety of nurses as well as client safety. MRSA also poses a threat to home care clients as majority are ill and frail elderly people who require assistance in daily life.

2 Description of the commissioning party

Päijät-Häme Joint Authority for Health and Wellbeing is the Commissioning party of this thesis. It is a public organisation owned by the municipalities of the Päijät-Häme region. Päijät-Häme Joint Authority for Health and Wellbeing is the region´s largest provider of social and health care services also including environmental health services. The organisation aims to provide quality care and services according to its values, which are related to caring, togetherness and innovation. Approximately 7000 professionals work for the organisation. Social and health care services of Päijät-Häme Joint Authority for Health and Wellbeing include dental care, health centres, family and social services, rehabilitation and services for the elderly. The Päijät-Häme Central Hospital provides health care services from 40 different specialty areas of medicine along with policlinics, hospital wards, labour and maternity services, laboratory services, rehabilitation and imaging. (Päijät-Hämeen hyvinvointiyhtymä 2020.)

There are 19 home care areas in the Päijät-Häme region functioning under Päijät-Häme Joint Authority for Health and Wellbeing, PHHYKY. These home care areas are located around the region in the different municipalities and cities. (Päijät-Hämeen hyvinvointiyhtymä 2021.) The number of practical nurses, registered nurses and public health nurses employed by PHHYKY in home care is 650. According to spokesperson of the cooperation partner, there are 26 practical nurses and 4 registered nurses working in Keskusta home care. The number of clients in the cooperation partner´s home care area is 96. In addition to the practical, registered and public health nurses, there are also other professionals associated with home care, including care aides, physiotherapists, doctors, occupational therapists, a urotherapist and a nurse specialised in wound care under PHHYKY. Home care also includes practical nurses whose job description consists of organizing the client lists and work for practical nurses working in the field of home care. (Liikonen 2021.)

Closer cooperation was carried out with the Keskusta Home Care unit which operates under the Päijät-Häme Joint Authority for Health and Wellbeing. Keskusta Home care is located in the centre of Lahti City. The hygiene nurse of the organisation also took part in cooperation. (Päijät-Hämeen hyvinvointiyhtymä 2020.) The spokesperson of the commissioning party was unable to provide information on the current number of clients carrying MRSA in home care under PHHYKY.

3 Home care as a nursing environment

Home care as a nursing environment means that all nursing tasks and services are carried out in the homes of the clients. Home care services are meant for clients, who require assistance for example with daily activities, medicines management or anything else health related, due to illness, decrease in functional capacity or other reasons. Home care aims to promote the safety of clients along with rehabilitation and coping in daily life by supporting the health, wellbeing and functional capacity as well as independence. (Terveyskylä 2019.) The purpose of home care is to support and enable living at home despite challenges with independent functioning in daily tasks, medicines management or other equivalent situations that may occur due to old age or illness. Providing sensibility, by arranging and providing health care services at home for clients to whom visiting health care facilities is challenging, is also a purpose of home care. (Päijät-Hämeen hyvinvointiyhtymä 2021.)

In Finland, legislation ensures care is available for those who need it. The law of social welfare serves the purpose of for example promoting and maintaining wellbeing and social security, ensuring needed, adequate and quality social services and promoting the clients right to good service. (Sosiaalihuoltolaki 2014, 1 §.) The purpose of the law of health care is to promote and maintain the health, wellbeing, functional capacity and social security of citizens, implement equal availability, quality and patient safety of needed services and establish and improve promotion of health and wellbeing among health care providers. (Terveydenhuoltolaki 2010, 2 §.) According to STM these two laws are the main legislation guiding the services of home care. Both law of social welfare services and health care are utilised. (Ministry of Social Affairs and Health b.)

The clientele of home care represents a broad range of different needs making it a challenging field of work with the constantly changing work environment in the numerous different homes of clients´. Majority of the clientele are elderly citizens living with different types of illnesses and disorders such as memory disorders, cardiovascular diseases, mental health problems, reduced mobility etc. Some clients require visits several times a day as others are visited once a week or even month. The functional capacities of different clients also differ broadly as there are bed-bound clients and clients who for example take care of their own grocery shopping. (Tampereen kaupunki 2021.) In order to become a client of home care, the need for service is assessed and a service plan is made. The service plan includes a definition of the client´s need for assistance and required services. Home care services are available as regular, temporary or round-the-clock according to client´s needs.

In the Päijät-Häme region, in addition the Päijät-Häme joint authority for health and wellbeing organisations own production, home care services can be provided as purchased services from the private sector and via service vouchers. (PHHYKY 2021.)

In addition to public health care providers, private health care services are available as well to reinforce the public services. Approximately a quarter of all social and health care services are provided by the private sector by selling their services to for example municipalities or directly to clients. Legislation regarding private service providers is prepared by The Ministry of Social Affairs and Health. (Ministry of Social Affairs and Health a.) Examples of private home care service providers in Päijät-Häme include Stella Kotipalvelut Oy, Päijät-Hämeen Kotihoiva Oy and Hyvinvointia kotiin Oy and numerous other similar companies.

According to THL, the Finnish Institute for Health and Welfare, 35% out of the 45 000 staff members working in elderly care, are employees of home care in Finland in 2018. (THL 2018.) In spring of 2021, there were 17 000 employees in home care. Out of these 17 000 employees, 74% were practical nurses and 12% registered nurses or public health nurses. (THL 2021.) THL also states that in 2020, there were approximately 208 000 clients in home care. Majority of these clients received regular home care services or were so called intensive clients as they used a lot of services. (THL 2020a.)

The Ministry of Social Affairs and Health, STM, plays a role in home care as it oversees preparing legislation, planning and guidance of home care. According to STM, the municipalities are responsible for arranging home care services for residents in need. In addition to home care services, additional services are available to complete overall care. (Ministry of Social Affairs and Health b.) According to the individual needs of a client, there are numerous services available via home care. These include cleaning services, meal and grocery services, physiotherapy and many others. Home care also utilises various technology and digitalisation in caring for clients. (Tampereen kaupunki 2021.)

Nursing tasks performed by home care nurses daily consist of assisting with daily activities such as hygiene care and nutritional needs, dispensing and administrating medications, different levels of wound care, catheterization, rehabilitation and much more. Home care nurses observe the wellbeing of their client during visits as well as deliver social contact via interaction. A home care nurse´s workday consists of visiting several clients at appointed times and performing required tasks in the client´s home and assisting the client with daily activities if needed. (Tampereen kaupunki 2021.) Employees of home care represent many professions including practical nurses, registered nurses, public health nurses, physiotherapists, doctors, occupational therapists and social workers. (Helsingin sosiaali- ja terveystoimi 2021.)

4 MRSA – a burden in health care

4.1 Methicillin-resistant Staphylococcus aureus

MRSA is short-form for Methicillin-resistant Staphylococcus aureus. Staphylococcus aureus, a common bacterium, found on the skin and mucous membranes of the nose of healthy humans, typically causes mild infections. (THL 2020b.) In some cases, it can also cause severe infections such as pneumonia or even sepsis. MRSA is a type of Staphylococcus aureus resistant to certain antibiotics. It can cause similar infections as Staphylococcus aureus, however treating such infections is more challenging as antibiotics may not have an effect on the bacteria, thus compromising the healing of the infection. MRSA spreads by skin contact and majority of the infections are transmitted from other people carrying MRSA. (Anttila 2020a.) MRSA is also capable of causing symptomatic infections to healthy individuals as it is a part of the virulent microbe group. However, this is more unlikely. Though the most common location of MRSA colonisation in the human body is in the nostrils, it is also often found in the pharynx and lesions of the skin. Invasive devices such as urinary catheters are at risk for MRSA colonisation for example causing urine to carry MRSA, but it can also colonise colonize the perineum, rectum and vagina. (Anttila et al 2018.)

Healthy people carrying MRSA most likely are not affected by the bacteria but can pose a risk to others by transferring it to them via different contamination contacts. A significant risk factor in spreading MRSA are nursing staff members not following appropriate hygiene protocols, thus transferring bacteria to patients. MRSA is also capable of surviving on dry surfaces for longer periods of time if not cleaned and sanitized properly, thus posing a risk for spreading elsewhere. (Robinson et al 2014.) The research article "Methicillin-resistant Staphylococcus aureus (MRSA): what a nurse should know", states that in addition to MRSA spreading via skin contact, it can also be spread via a contaminated environment or equipment. Factors that contribute to a greater risk of infection involve open wounds, invasive devices and a weaker immune system of patients. This is more relevant in hospital environments; however, clients of home care may be at risk as well due to these factors. (Schultz 2010.)

Though the prevalence of healthcare–associated infections, HAIs, is relatively low in Finland and the other northern countries compared to countries located in central and southern Europe, the importance of preventing these infections is greatly emphasized. This is carried out in order to prevent a similar development of the increasing prevalence of HAIs as is

occurring in other parts of Europe from taking place in Finland. Many measures are implemented in health care facilities to promote the prevention of HAIs. MRSA infections are included in HAIs. Syrjänen et al describes the prevention measures to be the following, hand hygiene, one-patient rooms, personal protective equipment, cleaning and screening patients for HAIs. The importance of providing adequate information to patients about HAIs and prevention measures is highlighted. A patient who has been diagnosed with a healthcare-associated infection must be notified that they can continue living a normal life despite the HAI and precaution and prevention measures utilised in health care facilities. Especially in hospital wards and long-term care facilities the other patients´ right to remain uninfected by another patient must be ensured. This is also seen as promoting patient safety. (Syrjänen et al 2015.) According to Sihvonen et al, the prevalence of antibiotic-resistant bacteria is becoming more common, thus setting a demand for awareness of this type of threat in health care. For example, MRSA causes epidemics in wards yearly. In 2008, the city of Tampere experienced an exceptionally broad MRSA epidemic, which was tamed with strict hygienic protocols. In 2016, there was an increase in MRSA prevalence assumably due to the arrival of a large number of refugees. (Sihvonen et al 2018.)

4.2 Impacts of MRSA

MRSA is one of the sources that causes healthcare–associated infections. According to the Finnish institute for health and welfare (THL), the annual prevalence of healthcare-associated infections in Finland is 100 000. In 2019, approximately 1400 new cases of MRSA were found. (THL2020c.) Healthcare-associated infections either cause or contribute to the cause of approximately 1500-5000 deaths per year in Finland. In Europe, in 2015, the estimated average of new MRSA infections per year was roughly 144 000. The number of MRSA associated deaths in 2015 was estimated to be 7000. (Cassini et al 2018, 59-63.)

A study conducted in Sweden to determine an estimate on additional health care costs due to resistance to antimicrobial drugs suggests the total amount to be over 400 million euros by the year 2030. MRSA, which is the second most common antibiotic resistant bacteria, according to the study, is estimated to cause additional health care costs of up to 128 million euros by 2030. These high numbers of costs are relevant, despite the fact, that Sweden has a low level of resistance, and the pace of increase is slow. (Larsson et al 2018.) Another study conducted in Norway focusing on the impacts of MRSA in hospitalized patients, concludes that MRSA is an economic burden due to high additional costs. It also contributes to lengthened hospital stays compared to patients who do not carry MRSA. The study con-

cludes that in Norway the average number of extra days spent in the hospital among patients with MRSA is eight days. There was also slightly a higher risk of readmission among MRSA-carrying patients compared to those with no MRSA. (Andreassen et al 2017.)

As a patient, being infected with MRSA has a negative impact on the individual´s life, according to a Swedish study focused on patient experiences living with MRSA. The study concludes that there is a significant lack in patient education among MRSA-infected patients and due to this phenomenon, patients have even been subject to bullying. In addition, being infected with MRSA causes additional stress to the patient of not transferring the bacteria to others. Patients infected with MRSA expressed they have been subjected to improper behaviour from healthcare workers due to MRSA carriage thus causing feelings of vulnerability and anger. (Skyman et al 2016.) The impacts of MRSA carriage are not only relevant with patients but with nursing staff as well. A Dutch study conducted on perceptions of nurses carrying Methicillin-resistant Staphylococcus aureus concludes that improving information and guidance among employees is essential in order to reduce MRSA carriage in nurses along with the negative impacts it brings along. According to the study, nurses´ work-related future, personal health and social environment are impacted significantly in a negative sense. Though MRSA carriage among nurses usually do not express physical symptoms, the mental and social effects can be significant due to eradication treatment and social isolation along with the fear of spreading the infection elsewhere. The study suggests further research should be carried out on the topic as there is a lack of exploration among the experiences of healthcare workers infected with MRSA. (van Heuvel et al 2020.)

As presented in the sections above, MRSA has a negative impact and is a burden in health care in more ways than one. Not only does it cause significant increases in costs becoming an economic burden, but it also affects the health, wellbeing and lives of many for example by causing infections, lengthened hospital stays and even increased mortality. Along with the physical and economic impacts, it also has negative effects on the mental health of the MRSA-infected. Both patients and nursing staff require more education and guidance on the matter in order to prevent the spreading of this bacteria.

5 Prevention of MRSA in home care

Prevention as a concept in health care is an entirety that consists of several other concepts and actions. Examples of these include promoting, preserving and restoring health and minimizing suffering and distress. For prevention to be effective, there are several matters to be considered. These include proper knowledge, identifying risk factors, appropriate detection and treatment measures available and constant evaluation and development. Prevention is an important part of promoting health. (Know Public Health 2019.)

Preventing healthcare-associated infections is essential for many reasons. According to the statistics and concrete numbers presented in previous sections, we can conclude that MRSA alone is a serious matter, and measures should be taken to prevent such healthcare-associated infections from taking place. MRSA causes unnecessary deaths and infections and is an economic burden due to expensive additional health care costs. An important tool to prevent the spreading of MRSA is asepsis and hygiene protocols. (Kolho et al 2020.) When caring for MRSA carrying clients in home care contact precautions should be used. Once again, the importance of proper hand hygiene cannot be emphasized enough. Hand disinfectant should be used before entering and after leaving the client´s home, before and after touching the client and before putting on disposable gloves and after taking them off and additionally if needed. Disposable gloves and an apron should be used in patient care. Face mask is required to be worn during wound care. If there is a risk of splashing of bodily fluids or discharges, protective eyewear should be used. (Kangaslaakso 2021.)

There are numerous different methods to prevent the spread of infections. A clinical review article presents several effective measures in infection control and specifically MRSA. The clinical review article is based on infection prevention in care home environments but is relevant to home care as well. Communication among nursing staff is essential to ensure all employees are following the same hygiene protocols. Clients´ wounds should be covered and the dressings clean especially in public areas with other people around. Encouraging home care clients to live a healthy lifestyle can prevent infections as well as living in a clean environment and ensuring regular cleaning in the home of the client. Contact precautions should be used when caring for MRSA-carrying clients. Another effective infection prevention measure is proper hand hygiene. (McArthur 2010.) Madeo et al also emphasize the importance of effective levels of hand hygiene as a method in preventing the spread of MRSA in their study “Effectiveness of an MRSA ´seek-and-destroy´ approach in home care”. The study states that proper hand hygiene is indeed the most effective measure in infection control. (Madeo et al 2014.)

A study “Fighting MRSA Infections in Hospital Care: How Organizational Factors Matter” found that it is also essential for employees to able to discuss errors, near misses and other incidents in a safe environment without the fear of punishment in order to learn and be educated on the topic. Administrative staff and managers should make such an environment to discuss possible and allow employees to utilise it as it plays a role in infection prevention. (Salge et al 2017.) According to Seibert et al, the perceptions and attitudes of health care workers have an effect on preventing transmission of drug-resistant bacteria such as MRSA via carrying out specific prevention precautions. The criticality of identifying challenges and barriers among health care practices is emphasized as it is an important component in promoting safety in care facilities and environments. Health care workers have also demanded clear instructions and education for isolation protocols when it comes to caring for patients as it results in a need for additional patient rooms, staff, education and communication as well as preventing health care workers posing as a source of contamination. (Seibert et al 2014.)

Though most studies focus on MRSA infection prevention in hospitals and care home environments, the same risk factors for infection are also relevant in home care. A home care client may be visited by several different nursing staff daily and the home care nurses also visit numerous clients every day. This increases the risk of transferring and bacteria from client to client if complying to proper hand hygiene protocols is lacking. As mentioned in a previous section, invasive devices, life-threatening diseases and repeated hospital stays increase the risk of MRSA infection. These risk factors are common among home care clients. (Toura 2020.) A research article suggests that screening patients for MRSA is more cost-effective than dealing with MRSA infections and additional costs caused by the negative health effects and lengthened hospital stays. Other additional costs caused by MRSA include additional use of personal protective equipment, cleaning services and staff-related costs. Screening can thus be an effective prevention measure in fighting MRSA infections. According to the article, MRSA´s ability to cause disease and morbidity can be greater than that of a regular Staphylococcus. Along with this phenomenon, an antibiotic used in treating MRSA infections may have a poorer effect and an increased usage of these antibiotics can worsen the situation as drug-resistant bacteria increase to exist and stronger antibiotics are no longer a solution in treating infections. (Oksanen et al 2011.)

In addition to wearing personal protective equipment in patient care, it is also important to ensure all medical equipment for example blood pressure meters are used hygienically. Medical equipment utilised with MRSA clients should be disposable, personal or must be disinfected after use. (Kolho et al 2020.) A study conducted on stethoscope contamination also concludes that effective disinfecting of equipment especially between different patients

is another important measure in preventing the spreading of MRSA and other bacteria. (Thom et al 2014.)

According to the National Clinical Guideline regarding prevention and control of MRSA from the National Institute for Health and Care Excellence, preventing the transmission of MRSA in non-acute health care environments is important. Precautions should be made in non-acute health care facilities and environments though the risk of transmission is lower than in acute health care settings. The guideline emphasizes several actions and recommends health care facilities and environments to follow them in order to prevent and control infections. Communication among health care facilities is emphasized especially regarding patients/clients carrying MRSA as for example clients of home care sometimes require hospital care, thus being transferred between different health care environments. Good communication is also important between health care professionals and patients and their family members as to what type of precautions must be taken when living with MRSA in order to minimize the spreading of the bacteria. Health care facilities are also recommended to utilise infection prevention and control programs, which include routine monitoring of risks, keeping employees educated on infection prevention and control precautions, developing and reviewing policies and procedures as well as monitoring care practices. Hand hygiene is once again mentioned as an essential measure in infection prevention and control. Clients colonised with MRSA do not pose a significant risk to the community and simple hand hygiene measures should be sufficient. However, such clients are obligated to inform nursing staff of home care about a possible MRSA infection in order to prevent nursing staff from transferring the bacteria to other clients. (National Clinical Guideline No. 2 2013.)

6 Purpose and aim of the thesis

The aim of this thesis was to create an educational video for home care nurses. The educational video contains information on MRSA and clear instructions on how to appropriately apply asepsis when caring for clients carrying MRSA.

The purpose of the thesis was to promote the knowledge of home care nurses on asepsis specifically when caring for MRSA-carrying clients. This knowledge also promotes client safety and the work safety of home care nurses. The information and instructions to promote the knowledge of home care nurses was provided via the final product of the thesis which is an educational video. Home care nurses include practical nurses, which are a majority in home care, registered nurses and public health nurses. Other professions involved in the home care field include physiotherapists, doctors, occupational therapists and social workers.

7 Implementation process

7.1 Practice-based thesis

This thesis was implemented as a practice-based thesis. The duration of the entire process took place over the course of approximately seven months. The main characteristic of a practice-based thesis is the aim of creating a concrete product. This product can be for example a guide manual, poster, brochure or video. The implementation of this type of thesis requires the involvement of different agents, who partake in the different stages of implementing the thesis. A practice-based thesis includes involving a commissioning party, which is a cooperation partner for the student carrying out this type of thesis. The commissioning party can be an organisation for which the thesis product is carried out. The product of the thesis is produced in cooperation with the commissioning party according to the cooperation partner´s needs. In order to implement a practice-based thesis, the student interacts and cooperates with the commissioning party by discussion, assessment and evaluation, focusing the direction of the project and giving and receiving feedback. In other words, a major part of the implementation of a practice-based thesis involves human interaction between the student and cooperation partner. (Salonen 2013, 16-20.)

Terms to describe the process of a practice-based thesis include innovation, development and work-life oriented. According to the reference, a practice-based thesis possesses main characteristics such as, usability, visual activity, concrete product, planned and guiding organisation. The author also brings up development as an important factor of this type of thesis which has been left out of the list of main characteristics of a practice-based thesis. (Salonen 2013, 12-13)

Aside from producing and creating a concrete product, a practice-based thesis also includes a written report and research part, thus consisting of two parts. The thesis provides information on the chosen topic based on evidence-based research. The product is then developed in close cooperation with the commissioning party and includes the evaluation and assessment of the product utilising different research methods. The research part follows the guidelines of a specific theoretical framework which is described in the following paragraph.

This practice-based thesis followed a framework called the linear model. This model presents the working stages schematically and consecutively, as the working stages are followed by one another according to the developing plan. The model starts with defining the aim or goal, the following stage involves the planning part which is followed by the implementation stage. Lastly comes the finalizing stage of the product and thesis along with the

evaluation and assessment. This model has faced some criticism due to the lack of consideration of different factors that could change the course of progress. For example, the model does not consider human factors, cultural or social factors and it appears simpler than it really is. The linear model is presented in figure 1. (Salonen 2013, 15.)

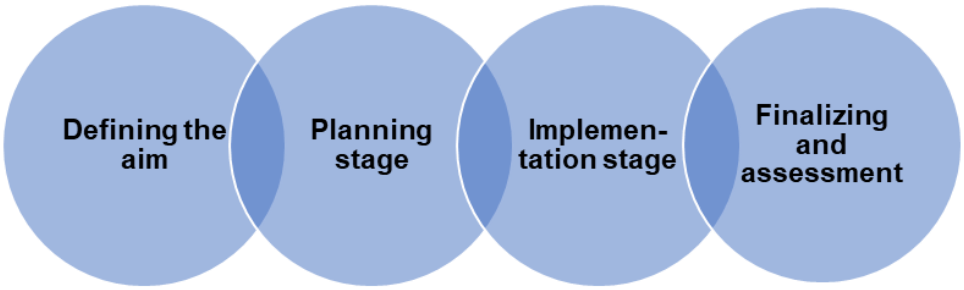

Figure 1. The linear model. (Modified from Salonen 2013, 15.)

The product of this practice-based thesis is an educational video. The content of the video provides clear instructions for home care nurses on how to appropriately apply asepsis when caring for MRSA-carrying clients. The educational video also provides basic information on the MRSA bacteria. The product was produced in cooperation with the commissioning party Keskusta Home Care (Keskustan kotihoito) of the Päijät-Häme Joint Authority of Health and Wellbeing, PHHYKY.

The developing process involves finding evidence-based research on the topic of this thesis. Once the needed information through broad researching was gathered, followed the planning and creating of the product. This phase requires a sufficient knowledgebase and definition of goals and aims.

During the planning and creating phase, communication with the spokesperson of the commissioning party took place on several occasions (see table 1, Appendix 1.) The cooperation partner´s needs and expectations regarding the product were discussed during interactions and taken into consideration when planning and creating the video. The spokesperson´s wishes regarding the content of the educational video included basic information on MRSA in the beginning of the video, followed by a motivational speech on why wearing personal protective equipment is important in order to prevent the spreading of the bacteria.

Lastly the commissioning party expected clear instructions on what type of PPE is required in different care situations when caring for a MRSA-carrying client.

The educational video was created with a video-making program called Animaker. Once the product was created taking the cooperation partner´s needs and expectations into consideration, it was presented to several home care nurses and the spokesperson during a work meeting at the office of Keskusta home care. After the presentation, feedback from the product was collected and documented.

7.2 Criteria of an educational video

Videos have become a popular method in educational purposes and play an important role in education. Videos have been integrated into different types of courses. According to a research article “Effective Educational Videos: Principles and Guidelines for Maximizing Student Learning from Video Content” technology such as a video can enhance learning and serve as a highly effective educational tool. (Brame 2016.)

The criteria of an educational video include the following points. When creating an educational video, working from a storyline and writing a manuscript are vital to ensure a structured and clear entirety. A lack of storyline and script may result in an unclear video with scattered information which is difficult to follow thus losing its educational capabilities. In order to create a structured storyline, the aim and goal of the video must be established thus creating a clear focus and direction for the video. The topic should be introduced and presented in an interesting and engaging way to capture the audience and maximize their interest in learning. It is essential to add interactive elements to the video to promote the engagement and involvement of the audience. Interaction and engagement promote learning thus fulfilling the most important goal of an educational video. Utilizing both audio and visual ways of communication in the video take into consider audience members with different learning styles allowing more people to learn equally. Lastly, when conducting a video, one must consider the length of it. Studies have shown that too long a video will not be watched entirely. Educational videos are more successful if they are shorter in length. Shorter videos are more likely to be watched entirely thus allowing a possibility to learn from received information via the video. (Columbia Center for Teaching and Learning.)

The product made in this practice-based thesis is an educational video. The goal and aim of the video are to educate and provide information and instructions on the chosen topic to the target group which in this case is home care nurses. The educational video was created according to the criteria of an educational video listed in the previous paragraph. The criteria

were followed in the video creating process in order to make a worthy and good quality video.

The video was planned before creating it and a manuscript was written to ensure clear presentation of information both audibly and visually on the video. The length of the video was left short to minimize the lack of interest and boredom amongst the audience. Different visual and audible elements were utilised to consider different types of learners and increase the interest of the video. The information is presented in two languages, English and Finnish. The main language of the video is Finnish, however English subtitles were added to consider nurses with international backgrounds who may watch the video in the future to ensure more people being able to understand the message of the video. Clear and simple language was used, and difficult words and phrases were avoided. Sentences were kept short and simple in order to increase the interest in the audience. Interactive and engaging elements were also included encouraging the audience to ponder the topic independently.

7.3 Developing process

Planning phase

During the planning phase, which is the second working stage of the linear model, the implementation of the thesis process is planned. In this thesis process the planning phase consisted of planning the contents of the thesis, the product and different methods utilised along the process. Prior to the planning phase, the definition of goals and aims of the thesis takes place. These provide a guideline to plan the thesis process in order to achieve the defined goals and aims.

The developing process was implemented by finding evidence-based research from different databases such as Cinahl, Pubmed and Medic and utilising nursing guidelines such as Duodecim. Information was also gathered from one of the hygiene nurses of Päijät-Häme Joint Authority of Health and Wellbeing, PHHYKY. The topic was researched by using the key concepts as key words, for example MRSA, home care, prevention and infection control.

Data search focused mainly on information dating back a maximum of ten years in Finnish and English. Most studies and information included as sources for the thesis were conducted in European countries, as there were not many Finnish studies available on MRSA and related matters. A small portion of research studies included in data search were conducted in Canada and the United States as they were seen as valuable assets to the thesis due to the provided information and perspective on the topic. Along with the databases

Cinahl, Pubmed and Medic, additional research and information utilised in the thesis was searched for from libraries, current Finnish nursing guidelines Duodecim and Terveyskirjasto and other reliable online sources.

Data search from Cinahl using the keyword MRSA searching research studies between the years 2010-2021 gave 4,974 results. Filtering only full text research studies gave 679 results, which of 14 were saved and utilised in the thesis process. These studies were searched between February and June of 2021. In March of 2021, the key word MRSA gave 10,815 results between the years 2011-2021 from the database Pubmed. The search word "MRSA in Home Care" gave 87 results and "Preventing the Spreading of MRSA" gave 256 results. "Prevention of MRSA transmission" as keywords gave 427 results on Pubmed. Out of these results from Pubmed, two research studies were saved and utilised. The database Medic resulted in 137 research studies or articles with the keyword MRSA between the years 2011-2021. Four of these were saved and utilised in the thesis process.

Though the keywords gave numerous results, only a very small portion of them were considered relevant to the topic of the thesis. No studies were found focusing on MRSA prevention in home care. Multiple studies were found on MRSA prevention in nursing homes and hospitals. Nursing home protocols on MRSA prevention were applied to the home care environment.

Once the knowledge base was collected by gathering evidence-based research and studies on the topic of the thesis and writing the research part of the thesis utilising collected research and studies as reliable sources, the planning phase of the educational video took place. The planning phase involved cooperation with the commissioning party, the spokesperson from Keskusta home care. During the early interactions with the spokesperson of the cooperation partner, their expectations regarding the educational video were discussed. The expectations included that the educational video should contain basic information on MRSA, a motivational speech on why preventing the spread of MRSA is important wearing personal protective equipment and clear instructions on what type of PPE to wear in different care situations caring for a client carrying MRSA. The expectations and wishes of the cooperation partner regarding the video, gave a helpful basis to the planning phase of the video. The structure of the video was created based on the cooperation partner´s wishes. The video was planned first to provide basic information on MRSA, what it is, the impacts it has on humans and health care and how it spreads. Additional information planned to be added to the video contained information on why wearing PPE is important when caring for MRSA-carrying clients and lastly what type of PPE and hygienic protocols are appropriate. The planning phase included writing the video plans on paper and what information to add

to the video also considering the criteria of an educational video. Once the information was planned, a manuscript was written based on utilised information. How the video was to be implemented was considered thoroughly and different options were examined. The educational video was finally planned to be created as an animated video. The planning of the animated video was implemented whilst creating it as the services of the video-making program were explored alongside the creating process.

Implementing phase

The implementing phase consisted of creating the educational video according to the prepared plans. The video was created as an animated video via a video-making program, Animaker. With solid plans as a basis, this phase was a straightforward process to implement. The criteria of an educational video played an important role in this phase, as it was created based on set criteria in order to implement a useful and instructive video, interesting and pleasant to watch thus ensuring it to be usable. The educational video includes animated backgrounds and objects provided by the program Animaker along with an animated character appearing in the video. The voice of the creator of the video was used as well to ensure audibility and enhance learning amongst audible learners. The main language of the video is Finnish, however English subtitles were added to consider nurses and nursing students with international backgrounds watching the video in the future. Creating the video demanded numerous do-overs and fine adjustments until it was considered ready.

In addition to creating an educational video, the implementing phase also included writing the written part of the thesis. This part also followed the ethical guidelines of a thesis ensuring no foul play or plagiarism during implementation. The written part was carried out with the basis of excessive collecting of data and material and evidence-based research related to the topic and producing text based on found information from reliable sources.

Evaluation, assessment, and data analysis

The final phase of the thesis process includes the evaluation and assessment part. This final phase of this thesis process was implemented by utilising the qualitative analysis methods thematic analysis and typification. In this case, the qualitative analysis is utilised in analysing the product of the thesis. There are many ways to carry out qualitative analysis. Emphasized perspectives in this type of analysis include the surrounding and background of the object, the purpose and significance of the object as well as expression and language. The quality, characteristics and meanings of the topic are the main targets of qualitative analysis aiming to better understand them in a broad sense. (Jyväskylän yliopisto 2010.)

Thematic analysis is a method of qualitative analysis. This method focuses on extracting the main themes from the research data. Themes are formed according to the different topics and examined in more detail. Topics searched from the data, categorized into different themes include matters regarding the theme, what is said about the theme and perspectives describing the theme. (KAMK University of Applied Sciences.) Thematic analysis is introduced as an approach for extracting meanings and concepts from gathered data, in the article “Understanding Thematic Analysis and its Pitfall” by Javadi et al. Pinpointing, examining and recording themes are included in this type of approach and there are no requirements regarding the form of the data. This method is used for analysing, detecting and reporting themes found in data. The article describes theme as concise and accurate and is presented in a shorter and simpler form than in the main text where the theme is extracted from. Thematic analysis includes coding as well and codes should be separated from themes as the code contributes to a theme, which is the outcome of coding. (Javadi et al 2016.)

According to the thesis plan, the initial plan was to have the audience assess the video by filling in a feedback questionnaire. However, this plan was not fulfilled. Instead, the audience of approximately 15 home care nurses and the spokesperson gave verbal feedback on the product after watching it, directly to the creator of the video. Notes were taken of the verbal feedback data. No collecting or saving of personal information took place. The feedback is attached to the thesis in the following paragraph.

This thesis utilised inductive thematic analysis meaning there is a strong relation between recognized themes and data. The themes may also be slightly related to asked questions. (Javadi et al 2016.) Utilising thematic analysis and using the criteria of an educational video as a directional aid, the feedback data of the product, educational video were categorized into four different themes. These themes were formed followingly, the appearance, the educational information, how the information is related and the length of the video. As the feedback data was analysed, these four themes were emphasized based on what the audience had to say about the product. All together eight different feedback comments were received from the audience. The thematic analysis was implemented by listing all the received verbal feedback in written form on paper. The feedback was read and analysed. Assessing then took place on what type of themes the feedback represents. The feedback comments were interpreted as codes, from which themes were formed. Four different themes were identified as an outcome to found codes. They were then categorized under each theme according to what they represented. The codes categorised under each theme are presented below in table 1. The four themes also represent criteria of an educational video. The thematic analysis table also includes the feedback of the hygiene nurse.

THEMES	SUBTHEMES	CODES
The appearance of the video	Appearance Visuality	Clear Great visual entirety Pleasant to watch Well done visually
The educational information	Instructive Educational Benefit Knowledge Information	Clear information Good information English subtitles are a benefit Facts were well limited Relevant information on MRSA Correct subject matter
How the educational information is related	Understandability Audibility Language and form	The information is explained clearly Plain, simple, easily understood language Good presentation of facts
The length of the video	Length	Conveniently short Appropriate length

Table 1. Thematic analysis

The audience was asked three more specific questions: Is this video useful for new home care nurses? Did you learn new information from this video? Does this video need to be improved? The first two questions received the answer “yes” and last question received no answers. The data collection environment was not completely unbiased as it may be intimidating for the audience to give constructive or negative feedback directly to the creator of the product. As the purpose of the thesis is to promote the knowledge of home care nurses on MRSA via the educational video, the additional questions presented in the beginning of this paragraph aim to determine whether the video is capable of fulfilling the aim or not. The questions were composed based on the aim and purpose of the video.

The video was also assessed by a hygiene nurse working under PHHYKY. The link to the video was sent to the hygiene nurse via email and feedback was received via email as well.

The feedback was collected and attached to this thesis. Once again, no personal information was gathered or saved. The feedback provided by the hygiene nurse included the following.

> *The video is indeed useful, it was pleasant to watch, visually well done, the facts were presented clearly and limited well, the length of the video was appropriate. Your voice is calm and clear, pleasant to listen to. The video contains everything relevant regarding MRSA. The subject matter is correct.* (Hygiene nurse 2021.)

The hygiene nurse also requested permission to utilise the educational video in training situations. Some fine minor suggestions for adjustments were made regarding finetuning the video. No corrections were required regarding the contents of the video.

8 Discussion

8.1 Ethical aspects and trustworthiness

A research project must follow ethical guidelines throughout the entire process to ensure the consideration of all ethical aspects regarding the research. Theses, conducted by students at Universities of Applied Sciences are also required to follow these guidelines. Several of the guidelines are based on Finnish legislation, especially if the focus of the research is studying humans. The promotion of responsible conduct of research is carried out by the Finnish National Board on Research Integrity (TENK). TENK is a part of the Ministry of Education and Culture, and its other missions include prevention of research misconduct and promotion of discussion and distribution of information on the topic. To ensure the ethical acceptability of a research, TENK provides guidelines for ethical considerations called "Responsible conduct of research and procedures for handling allegations of misconduct in Finland." (Finnish Advisory Board on Research Integrity 2012, 30-31.)

In this paragraph, ethical considerations and trustworthiness regarding this thesis process will be determined according to the guidelines. The entire process of this practice-based thesis strictly followed all requirements, regulations and guidelines that have been set for this type of research. The conducting of the thesis was carried out with honesty, carefulness and accuracy. The different methods utilised in this thesis met the criteria set for them in guidelines. When reading research articles and studies by other authors and researchers, their writing was respected and quoting other texts was done appropriately without any misconduct. This thesis required a research permission from the commissioning party, which means specific contracts were signed and a research proposal was submitted to the commissioning party.

This thesis was conducted by one individual, and it involved cooperation with the commissioning party and the participants. The thesis process was carried out according to the ethical guidelines and in a trustworthy manner. All partakers in the thesis were treated with respect. Viewing and assessing the product was completely voluntary and was carried out confidentially. The thesis process aimed to cause no purposeful harm for the environment or participants. The purpose was to provide benefits for the target group (home care nurses) and the process involved no risks for the partakers. No personal information was gathered on parties involved in the thesis, nor was any kind of registry maintained. Parties involved in the thesis process included the spokesperson and approximately 15 home care nurses from the commissioning party and a hygiene nurse of the Päijät-Häme Joint Authority of Health and Wellbeing, PHHYKY. Feedback data gathered after the presentation of the video

was handled with trustworthiness and analysed accordingly. Collected data was not accessed by third parties. No misconduct took place throughout the entire thesis process.

8.2 Assessment and further development

The aim of this thesis was to create an educational video for home care nurses. The educational video contains information on MRSA and clear instructions on how to appropriately apply asepsis when caring for clients carrying MRSA.

The purpose of the thesis was to promote the knowledge of home care nurses on asepsis specifically when caring for MRSA-carrying clients. This knowledge also promotes client safety and the work safety of home care nurses. The information and instructions to promote the knowledge of home care nurses was provided via the final product of the thesis which is an educational video. Home care nurses include practical nurses, which are a majority in home care, registered nurses and public health nurses. Other professions involved in the home care field include physiotherapists, doctors, occupational therapists and social workers.

Creating the video was successful and it was created based on the guidelines and criteria of a good educational video. According to the feedback received from the audience of home care nurses who watched the educational video, the video was informing and provided helpful information which is knowledge promoting. However, in this case, it is difficult to measure the results and effects of the educational video at this point. The video has not been put to proper use yet to fulfil its purposes such as promoting the knowledge of home care nurses regarding MRSA and proper hygienic protocols used in caring for MRSA-carrying clients, as well as promoting the work safety of nurses and client safety. According to the service manager of Keskusta home care, the educational video will be useful when new nurses and nursing students are orientated into the field of home care. Nevertheless, the aim of this thesis was to create an educational video, which was completed. The expectations and wishes of the cooperation partner regarding the educational video were fulfilled. The hygiene nurse of the commissioning party also stated that the video is useful and asked for permission to utilise the video in different educational settings.

Difficulties regarding data search and collecting current reliable material for the knowledge-base was challenging as there are no studies available conducted on the topic of the thesis, preventing the spreading of MRSA in home care. The findings of the thesis were gathered from studies conducted in health care facilities such as hospitals and care homes and utilised into the home care environment. Though MRSA is generally a largely researched subject, not many studies conducted in Finland were available. Most evidence-based research

studies utilised in this thesis were carried out in other European countries and some even in North America. As the state of the prevalence of MRSA varies greatly around the world and even in Europe in different countries, and Finland having one of the lower prevalence rates, the prevention protocols against MRSA remain the same, regardless of the country. (MRSA in the European Region. WHO 2015.)

The thesis uses methods such as the linear model as a guideline and framework for constructing the structure of the thesis. The linear model framework consists of consecutive working stages. Limitations regarding this model include that it does not consider different factors potentially changing the course of the progress. Examples of such limitations include lack of consideration towards human factors, cultural and social factors. The linear model is also more complex than it appears. (Salonen 2013, 15.) The evaluation and assessment of the product of the thesis, educational video, faces lacking qualities as well. Despite the criticism this framework has faced and lacking qualities, it does provide a clear and straightforward structure that is simple to follow. In the evaluation and assessment phase, the video was assessed and evaluated by numerous partakers. Some feedback for the educational video was received directly in person from the audience of home care nurses. Such an environment can be intimidating and limit the quality of feedback given and received. Anonymous feedback questionnaires may have been a better option in this case to ensure unbiased and honest feedback and evaluation. Nevertheless, received feedback both from the home care nurses and the hygiene nurse were valuable.

The product of the thesis can be utilised in the future whilst training nurses in the field of home care and nursing students, both practical nurses and registered nurses. Along with nurses, other professionals associated with home care and visiting clients of home care could benefit from the educational video as well. This thesis explores the negative effects of MRSA directly in humans and in the field of health care. The negative health effects of MRSA in humans can be life-threatening in the worst-case-scenario. In the field of health care, it is the cause for significant amounts of extra costs, thus financially burdening. It also lengthens patients´ hospital stays. (Andreassen et al 2017.) The educational video can be used for preventive purposes via educating and instructing home care employees the correct hygiene and prevention of infection transmission protocols, thus decreasing the chances of MRSA from spreading. The video could potentially help prevent unnecessary MRSA cases, thus promoting health as well. This would also play a role in lowering extra costs caused by MRSA.

MRSA as a topic is broad and plenty of research has been conducted on different MRSA-related topics. The topic of this thesis was limited to focus on the topic of preventing the

spreading of MRSA in home care. Since there are only few studies available on MRSA in home care, this could be researched more. An idea for further development and research on preventing the spreading of MRSA in home care could for example focus on educating home care personnel on the topic and measuring if it has a decreasing effect on MRSA cases among home care clients. However, this type of research would require a longer period of time to carry out. The topic of this thesis can potentially generate further researching of MRSA and even other drug-resistant bacteria in the field of home care.

References

Andreassen, A. et al. 2017. The impact of methicillin-resistant *S. aureus* on length of stay, readmissions and costs: a register based case-control study of patients hospitalized in Norway. Antimicrobial Resistance & Infection Control. Retrieved on 15 March 2021. Available at https://pubmed.ncbi.nlm.nih.gov/28694964/

Anttila, V. et al. 2018. Hoitoon liittyvien infektioiden torjunta. Terveyden ja hyvinvoinnin laitos. Helsinki.

Anttila, V. 2020a. Hoitoon liittyvät infektiot. Lääkärikirja Duodecim. Retrieved on 15 March 2021. Available at https://www.terveyskirjasto.fi/dlk01042

Anttila, V. 2020b. MRSA (metisilliinille resistentti Staphylococcus aureus). Lääkärikirja Duodecim. Retrieved on 12 March 2021. Available at https://www.terveyskirjasto.fi/dlk00586

Brame, C. et al. 2016. Effective Educational Videos: Principles and Guidelines for Maximizing Student Learning from Video Content. CBE Life Sciences Education. Retrieved on 2 June 2021. Available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5132380/

Cassini, A. et al. 2018. Attributable deaths and disability-adjusted life-years caused by infections with antibiotic-resistant bacteria in the EU and the European Economic Area in 2015: a population-level modelling analysis. The Lancet Infectious Diseases. Retrieved on 16 March 2021. Available at https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(18)30605-4/fulltext

Creating Effective Educational Videos. Columbia Center for Teaching and Learning. Retrieved on 2 June 2021. Available at https://ctl.columbia.edu/resources-and-technology/teaching-with-technology/diy-video/effective-videos/

Finlex. 2014. Sosiaalihuoltolaki. Retrieved on 2 November 2021. Available at https://www.finlex.fi/fi/laki/ajantasa/2014/20141301

Finlex. 2010. Terveydenhuoltolaki. Retrieved on 2 November 2021. Available at https://finlex.fi/fi/laki/ajantasa/2010/20101326

Finnish Advisory Board on Research Integrity. 2012. Responsible conduct of research and procedures for handling allegations of misconduct in Finland. Helsinki.

Helsingin sosiaali- ja terveystoimi. 2021. Kurkista kotihoitoon. Retrieved on 2 November 2021. Available at https://www.hel.fi/toihinsoteen/fi/toihin-kotihoitoon/kurkista/

Javadi M. et al. 2016. Understanding Thematic Analysis and its Pitfall. Journal of Client Care. Retrieved on 24 November 2021.

Jyväskylän yliopisto. 2010. Qualitative analysis. Koppa. Retrieved on 13 October 2021. Available at https://koppa.jyu.fi/avoimet/hum/menetelmapolkuja/en/methodmap/data-analysis/qualitative-analysis

KAMK University of Applied Sciences. Teemoittelu. Opinnäytetyöpakki. Retrieved on 13 October 2021. Available at https://www.kamk.fi/fi/opari/Opinnaytetyopakki/Teoreettinen-materiaali/Tukimateriaali/Laadullisen-analyysi-ja-tulkinta/Teemoittelu

Kangaslaakso, M. 2021. Palvelutalojen hygieniaohjeet. PHHYKY. Retrieved 24 May 2021.

Know Public Health. 2019. Concept of prevention. Retrieved on 23 November 2021. Available at https://knowpublichealth.com/concept-of-prevention/

Kolho, E. et al. 2020. Ohje moniresistenttien mikrobien tartunnantorjunnasta. Terveyden ja hyvinvoinnin laitos. Ohjaus.

Larsson, S. et al. 2018. A microsimulation model projecting the health care costs for resistance to antibacterial drugs in Sweden. The European Journal of Public Health. Retrieved on 15 March 2021. Available at https://pubmed.ncbi.nlm.nih.gov/30304449/

Liikonen, K. 2021. Service Manager. PHHYKY. Interview on 3 November 2021.

Madeo, M. et al. 2014. Effectiveness of an MRSA 'seek-and-destroy' approach in care homes. Retrieved on 4 June 2021. Available at https://www.researchgate.net/publication/289321803_Effectiveness_of_an_MRSA_'seek-anddestroy'_approach_in_care_homes

McArthur J. 2010. How to prevent the spread of MRSA in the care-home setting. Nursing & Residential Care. Retrieved on 4 June 2021.

Ministry of Social Affairs and Health b. STM. Kotihoito ja kotipalvelut. Retrieved on 2 November 2021. Available at https://stm.fi/kotihoito-kotipalvelut

Ministry of Social Affairs and Health a. STM. Yksityiset sosiaali- ja terveyspalvelut. Retrieved on 2 November 2021. Available at https://stm.fi/yksityiset-sotepalvelut

National Clinical Guideline No. 2. 2013. Prevention and Control Methicillin-Resistant Staphylococcus aureus (MRSA). National Clinical Effectiveness Committee. Retrieved on 24 November 2021.

Oksanen, P. et al. 2011. MRSA:n seulonta kustannustehokasta hoidon lisäkuluihin verrattuna. Lääkärilehti. Retrieved on 12 March 2021.

Päijät-Hämeen hyvinvointiyhtymä. Updated 2021. Kotihoito. Retrieved on 29 October 2021. Available at https://www.phhyky.fi/fi/ikaantyneiden-palvelut-ja-kuntoutus/kotihoito-ja-tukipalvelut/paijat-hameen-hyvinvointiyhtyman-kotihoito/

Päijät-Hämeen hyvinvointiyhtymä. Updated 2020. Yhtymä. Retrieved on 9 March 2021. Available at https://www.phhyky.fi/fi/yhtyma/

Salge, T. et al. 2017. Fighting MRSA Infections in Hospital Care: How Organizational Factors Matter. Retrieved on 18 June 2021. Available at https://web-p-ebscohost-com.ezproxy.saimia.fi/ehost/pdfviewer/pdfviewer?vid=10&sid=137244dd-5f18-4753-9ea3-f57a4ecefed4%40redis

Salonen, K. 2013. Näkökulmia tutkimukselliseen ja toiminnalliseen opinnäytetyöhön. Turun ammattikorkeakoulu. Turku.

Schultz, M. 2010. Methicillin-resistant Staphylococcus aureus (MRSA): what the nurse should know. Retrieved on 16 June 2021. Available at http://web.b.ebsco-host.com.ezproxy.saimia.fi/ehost/pdfviewer/pdfviewer?vid=4&sid=db01fcf5-90d4-4b47-8fbb-62ad5270ca0e%40pdc-v-sessmgr01

Seibert, D. et al. 2014. Preventing transmission of MRSA: A qualitative study of health care workers´ attitudes and suggestions. American Journal of Infection Control. Retrieved on 27 February 2021. Available at https://doi.org/10.1016/j.ajic.2013.10.008

Sihvonen, R. et al. 2018. Mikrobilääkkeille resistentit bakteerit yleistyvät. Duodecim. Retrieved on 16 June 2021. Available at https://www.duodecimlehti.fi/duo14428

Skyman, E. et al. 2016. Being Met as marked – patients' experiences of being infected with community-acquired methicillin-resistant Staphylococcus aureus (MRSA). Retrieved on 4 June 2021. Available at https://web-p-ebscohost-com.ezproxy.saimia.fi/ehost/pdfviewer/pdfviewer?vid=3&sid=137244dd-5f18-4753-9ea3-f57a4ecefed4%40redis

Syrjänen, J. et al. 2015. Mikrobitartuntojen torjunta on potilastuvallisuutta. Duodecim. Retrieved on 15 March 2021. Available at https://www.duodecimlehti.fi/duo12328

Tampereen kaupunki. Updated 2021. Mitä kotihoito on? Retrieved on 3 June 2021. Available at https://www.tampere.fi/sosiaali-ja-terveyspalvelut/ikaihmisten-palvelut/apua-kotiin/kotihoito/palvelut.html

Terveyskylä. Updated 2019. Kunnallinen ja yksityinen kotihoito. Retrieved on 3 June 2021. Availble at https://www.terveyskyla.fi/ikatalo/ik%C3%A4%C3%A4ntyneelle/apua-arkeen/kunnallinen-ja-yksityinen-kotihoito

The Finnish institute of health and welfare. THL. 2018. Kolmasosa vanhuspalvelujen henkilöstöstä työskentelee kotihoidossa – asiakkaat entistä huonokuntoisempia. Retrieved on

2 November 2021. Available at https://thl.fi/fi/-/kolmasosa-vanhuspalvelujen-henkilostosta-tyoskentelee-kotihoidossa-asiakkaat-ovat-entista-huonokuntoisempia

The Finnish institute of health and welfare. THL. 2020a. Kotihoito. Retrieved on 2 November 2021. Available at https://thl.fi/fi/tilastot-ja-data/tilastot-aiheittain/ikaantyneet/kotihoito

The Finnish institute of health and welfare. THL. 2021. Home care. Retrieved on 2 November 2021. Available at https://thl.fi/en/web/ageing/older-people-services-undergoing-a-change/home-care

The Finnish institute of health and welfare. THL. Updated 2020b. MRSA. Retrieved on 12 March 2021. Available at https://thl.fi/fi/web/infektiotaudit-ja-rokotukset/taudit-ja-torjunta/taudit-ja-taudinaiheuttajat-a-o/mrsa

The Finnish institute of health and welfare. THL. Updated 2020c. MRSA esiintyvyys Suomessa. Retrieved on 12 March 2021. Available at https://thl.fi/fi/web/infektiotaudit-ja-rokotukset/taudit-ja-torjunta/taudit-ja-taudinaiheuttajat-a-o/mrsa/mrsa-esiintyvyys-suomessa

Thom, J. et al. 2014. Stethoscope contamination with Methicillin-resistant Staphylococcus Aureus (MRSA) in an inner-city emergency department. Retrieved on 27 February 2021. Available at https://web-p-ebscohost-com.ezproxy.saimia.fi/ehost/pdfviewer/pdfviewer?vid=12&sid=137244dd-5f18-4753-9ea3-f57a4ecefed4%40redis

Toura, S. et al. 2020. Infektioiden torjunta pitkäaikaishoidossa ja –hoivassa. Retrieved on 18 June 2021. Available at https://www.julkari.fi/bitstream/handle/10024/139297/URN_ISBN_978-952-343-464-6.pdf?sequence=1&isAllowed=y

Robinson, J. et al. 2014. MRSA care in the community: why patient education matters. Retrieved on 16 June 2021. Available at http://web.b.ebscohost.com.ezproxy.saimia.fi/ehost/pdfviewer/pdfviewer?vid=7&sid=db01fcf5-90d4-4b47-8fbb-62ad5270ca0e%40pdc-v-sessmgr01

van Heuvel, L. et al. 2020. Perceptions of Dutch nurses carrying methicillin-resistant Staphylococcus aureus: a qualitative study. Retrieved on 18 June 2021. Available at https://web-p-ebscohost-com.ezproxy.saimia.fi/ehost/pdfviewer/pdfviewer?vid=6&sid=137244dd-5f18-4753-9ea3-f57a4ecefed4%40redis

World Health Organization. 2015. MRSA in the European Region. Retrieved on 5 November 2021. Available at https://www.euro.who.int/en/health-topics/disease-prevention/antimicrobial-resistance/surveillance/prevalence-maps/mrsa-in-the-european-region-ears-net-and-caesar,-2015

World Health Organization. 2021. About AMR. Retrieved on 6 November 2021. Available at https://www.euro.who.int/en/health-topics/disease-prevention/antimicrobial-resistance/about-amr.

.

Appendix 1. Table 2.

Cooperation schedule of the thesis process

February 2021	Sent email to cooperation partner	Service manager of Keskusta home care, Kati Liikonen
February – May 2021	Interaction via email with cooperation partner	The spokesperson of Keskusta home care, Kati Liikonen and PHHYKY hygiene nurse, Minna Kangaslaakso
11.5.2021	Meeting with cooperation partner via Teams	Kati Liikonen
May 2021	Applied for research permit	Accepted until August 31st
August 2021	Interaction with cooperation partner via text message and phone call	Kati Liikonen
	Applied for extending research permit until September 30th	Application accepted
28.9.2021	Presented product to the cooperation partner at Keskusta Home Care headquarters	Kati Liikonen and approximately 15 practical nurses and registered nurses
November 2021	Interaction with a hygiene nurse of PHHYKY and spokesperson of the commissioning party via phone and email	Sari Mölsä and Kati Liikonen

Appendix 2. Video 1.

MRSA Educational Video for Home Care