



# Nurses' safety in the Home Hospital Environment

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**Nurses Safety in the Home Hospital Environment**

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The home hospital which is a part of home health care (HHC), has not been around for long, so not too many studies have been carried out that can help nurses stay safe in this environment. The aim of this thesis is to produce information that will help educate the nurses on how to feel safe at their home hospital working environment.

The purpose of this thesis is to describe the factors that promote and the factors that hinder the safety of nurses in their home hospital environment. The research questions where; What are the factors that promote nurses' safety in the home hospital environment? & What are the factors that hinder nurses' safety in the home hospital environment?

Method: This is a descriptive literature review conducted from 2010 - 2021 on nurses' safety in a home hospital environment. CINAHL, PubMed, Elsevier, and Google scholar where the primary database for the search of literature. Keywords included "home care", "home hospital nursing" and "occupational safety of nurses" in 10 articles met the criteria.

Findings: Data analysis of the literature pointed out five categories for hindering factors (1) Hindering factors due to geographical location (2) Hindering factors due to workplace setting (3) Hindering factors due to patient and family members (4) Hindering factors due to the nurses themselves and (5) Hindering factors due to the home care institution. There were also three categories for promoting factors (1) Promoting factors by the health sector. (2) Promoting factors by the care institution and (3) Promoting factors by the nurses themselves.

Conclusion: The nurse's safety should be ensured prior to their leaving the work environment and burn out feelings should to be avoided.

Keywords: Home care, home hospital nursing, occupational safety of nurses

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## 1 Introduction

In the EU, North America and other parts of the world, the number of people being cared for at home professionally has greatly increased. The reason for the increase is to reduce health costs (Rostgaard & Szebehely 2012) and improve patients' possibility to stay in the comfort of their homes while getting quality care (Vaartio-Rajalin, Kasanga & Fagerström. 2019). Societal changes are placing new demands on social and healthcare services, infrastructures, processes and even the outcomes. Nurses working in home health care (HHC) come across lots of challenges especially as more advanced care and treatment are increasingly being carried out in patients' homes. The home hospital which is a part of home health care (HHC), has not been around for long, so not too many studies have been carried out yet that can help nurses stay safe in this environment. In the UK for example "Hospital at home" was launched in 2015 (Lewisham and Greenwich n.d). Nurses' education, experience, abilities, prior learning, beliefs, attitudes, and values are key factors in the delivery of home-based nursing care and has a big role in identifying challenges faced by nurses at home hospitals. It will also determine how these challenges can be managed in a way that nurses feel safe at their home hospital working environment. The purpose of this thesis therefore is to describe the factors that promote and the factors that hinder the safety of nurses in their home hospital environment.

## 2 Definition of concepts

### 2.1 Home health care

Home health care can be defined as chronic or Long-term illness management that takes place at patient's home. It could either be on the street, homeless shelters, or a mansion. The patient's environment plays an important part in the kind of care the patient receives and the role the nurses play in it. This include treatment of patients with acute conditions who would otherwise have required treatment in the hospital bed and provision of a level of care that would normally be provided in a hospital bed. These services are provided at home alongside an appropriate level of emergency back-up when need be. (Neal-Boylan 2011)

Home health care are services organized to give support in a way to maintain health and functionality and give care to the sick, elderly ones with disorders, convalescents, patients

suffering from chronic diseases and people over the ages of 18 suffering from various disabilities. (Helsinki 2020)

The idea is to assist patients go through their healing process while still being able to carry out their daily activities at home. A care plan is made according to the needs of the patient, and it is done alongside the customer and their loved ones. The service provided is recorded by a home care service team. A patient may need home care services if there is evidence that there is a need for assistant with getting out of their beds or chairs, walking, going to the toilet, washing, dressing, and even eating. These services can be organized by a call to the home care service area team. (Helsinki 2020)

### 2.1.1 Home hospital nursing

Home hospital or hospital at home as it is sometimes called is an innovative care model that has been adopted by health care organizations that provide the kind of care you will normally get in hospital at the comfort of your own home (Suomi.fi 2021). The services also include home visits by the care staff. Nurses at home hospital usually administer different levels of care including iv antibiotic treatment, blood transfusion, palliative care etc. According to Hospital at home (2012), patients get diagnostic studies like echocardiograms, X-rays, oxygen therapy, electrocardiograms, and other forms of therapy including intravenous fluids, respiratory therapy, pharmacy services and services from skilled nursing professionals. Arrangement is made for clients who need hospital stay for some disease like community-acquired pneumonia, congestive heart failure, chronic obstructive pulmonary disease, and cellulitis. Patients who meet special medical eligibility criteria can get hospital-level-care. This usually includes diagnostic tests and treatment therapies from doctors and nurses in the comfort of their homes.

Included in the home nursing service package are also rehabilitation services ordered by the doctor. To obtain rehabilitation services at home, the patient will need a referral to receive home nursing services from a doctor. This can come even easier when the said client cannot receive these services in any other way. (Helsinki 2020). Hospital at home or home hospital can be found in several places in the world including USA, UK, Canada, and Finland (kotisairaala, Liikkuvat Sairaalat etc.).

The idea of a mobile hospital (Liikkuvat sairaalat) for example is to bring care to the patient. In this way, elderly patients do not have to be transported to the emergency room, but emergency procedures can be carried out on site in a nursing home or at the elderly's home. "Hus Akuuti" and "Liisa" Mobile hospital work in collaboration with the City of Espoo. (Espoo 2019).

### 3 Occupational safety for nurses

According to Zelnick, Levenstein, Farrant and Wooding (2011) occupational safety can be seen as the shared understanding of the dynamics of the work environment and the interaction of levels of causation of occupational injury and illness. The protection of workers depends on a triangle of control between the boss workers and any potential hazards. How this happens will depend on race and gender, still class struggle cannot be ignored for it is the bottom-line determinant of occupational health and safety.

As described in the Occupational Health Report (World Health Organization 2021). occupational health has a very close relation to public health and the development of the health system. WHO addresses determinants of workers' health, with the risk for diseases and injury in the occupational environment, social and individual factors, and access to health services?

According to Gershon, Pogorzelski, Qureshi, Stone, Canton, Samar, Westra, Damsky, Sherman, Henriksen, Battles, Keyes, and Grandy (2008), the prevention of nurses from workplace induced injuries and illnesses cannot be over emphasized. Having well-rested and healthy nurses is vital for providing vigilant monitoring, empathic patient care and vigorous advocacy. Stressful factors related to immediate work context which are responsible for producing diseases and injuries are present in the nursing work environment. The different hazards found in the nurses' place of work can impair health both in the short and long run.

Five danger areas for nurses' safety listed in the American occupational safety and health act (OSHA) memo include musculoskeletal conditions related to patient and resident handling (ergonomics); workplace violence (bullying, intimidation, verbal abuse, racism, aggression, harassment etc.), blood-borne pathogens, slips, trips, and falls. Other areas where you may find occupational safety issues in home hospital nursing will be shift work, poor weather conditions and means of transportation. (Brent 2016).

Providers must be able to recognize the possibility of violence, hence nurses on duty at patients' homes must be aware of the patients' community, know how to avoid violent situations and be familiar with their organization's policies and procedures related to violence and how it can be avoided. Nurses at home hospital may also be exposed to a variety of potentially serious or even life-threatening hazards including guns, weapons, illegal drugs or verbal abuse and other forms of violence, blood-borne pathogens, communicable diseases, needlesticks, latex sensitivity, temperature extremes, and unhygienic conditions (lack of clean water, unclean or hostile animals and animal waste). (Trinkoff, Geiger-Brown, Caruso, Lipscomb, Johantgen, Nelson, Sattler & Selby 2008).

#### 4 Purpose, aim of study and research question.

The purpose of this thesis was to describe the factors that promote and the factors that hinder the safety of nurses in a home hospital environment.

The aim is to produce information that will help educate the nurses on how to feel safe at their home hospital working environment.

#### Research Question

What are the factors that promote nurses' safety in the home hospital environment? What are the factors that hinder nurses' safety in the home hospital environment?

#### 5 Methodology

##### 5.1 Literature review

"A literature review is the comprehensive study and interpretation of literature that relates to a particular topic" (Aveyard 2010). When doing a literature review, it is important to identify a research question then work towards answering the question by looking for and then using a systematic approach to analyze the relevant literature. With the help of this review, a new perception can be developed when each piece of the relevant information is perceived in the context of other information. Literature review is vital because it works towards summarizing available literature on any one topic. What literature review does is that it takes a piece of research and makes an analysis of the literature present, in this way the reader will not have to access each specific research report that has been added into the review. Considering that it is the duty of every health professional working in the field to be up to date with recent developments and research that informs their practice, it brings us to the realization that it is almost impossible for any practitioner to collect, process and decide how to apply all this information in their profession. This therefore is one of the reasons why literature review is used to bring together valid information about a particular topic. Since there is likely to be a vast variety of information on the web on our specific topic, we will keep in mind that not all the information that authors find will be of good quality or useful to us. It is important to find the kind of literature that will help us answer our research question. The authors shall also consider distinguishing between the different types of information they find. (Aveyard 2010).



## 5.2 Descriptive literature review

As stated by Jessen, Matheson & Lacey (2011), a descriptive review is the most common method among students and researchers in social science, nursing research and education that is derived from various academic disciplines. It includes different methods, qualitative, quantitative, and theoretical studies. This type of review explains and gives us information about a particular subject and provides a detailed background for understanding that specific topic. By doing descriptive review, the authors summarized theories critically, explored studies and reviewed methods used in existing research. The authors compile a wide range of literature written about the topic and combine it into consistent interpretation that highlights the main issue, biases, complexities, and conflict that are within it. The authors will identify and evaluate each article and may give suggestions or direction for further research or problems that need to be investigated and possible implementation for action.

Descriptive review starts with a description of a research question and what to look for in the article. The researcher not only answers the question but provides a consistent understanding of how the topic is conceived within the existing literature. This understanding of review may result in more investigation and further studies in the future. (Jessen et al. 2011)

There are some steps associated with doing a literature review. The first step is identifying the topic of your research, then breaking down and clarifying it. The question of topic or research may develop during the writing process as researchers advance their knowledge. It is necessary to understand a research question and its complexity of the subject helps researchers formulate a clearer and more concise question. Even though in this step, researchers may do changes or modification but formulating a question will help them organize their literature review better and improve its effectiveness. (Jessen et al. 2011)

The next step is searching for material and evidence-based articles through electronic databases. In this step researchers use accurate keywords to have the most relevant and effective search relating to the research topic. Using a different synonym for the keywords can better search results because different authors use different terminology for the same term. Researcher defines what to include or exclude in the literature review which is likely the clearest aspect the literature is reviewing (Boote & Beile 2005).

Search criteria enables the researchers have a clear selection process. Once a researcher is searching for material, books, articles, and reports about his or her topic, these questions should be asked of oneself: What can I extract from the text that directly associates with my understanding of my research topic, that may assist me in attempting the answer to a research question once relevant articles or materials are found? careful reading and note taking, will enable us analyzation and summarizing of material (Jessen et al 2011).

### 5.3 Data collection

Once the research question to be answered by literature is created and the specific type of literature to be used is identified, the authors develop a systematic search strategy to identify and locate the widest range of published material to answer this research question in the most comprehensive way. It is very crucial to identify as much of the literature relevant to this research study as possible, regardless of the author's time and financial restriction. The research should be carried out in a logical and systematic way to ensure all relevant literature needed is identified. (Aveyard 2010)

Information and data collected through different electronic databases are appropriate and relevant to this thesis. Relevant data bases will include CINAHL, PubMed, Elsevier, and Google scholar for students to use during thesis writing. When a database is selected, keywords are then defined to help with the literature search. Keywords are created based on research questions or on the main concept of the research question which makes study and research specific (Aveyard 2010).

In this thesis, keywords include home care, home hospital nursing and occupational safety of nurses. Additionally, with the help of synonyms, authors can identify relevant articles from several sources. With the help of these keywords, the authors can come up with as many findings as possible. The authors will remember to use the most up to date literature which are less than 10 years old, and this will be done in a systematic way. It will be important to take note of specific inclusion and exclusion criteria that enables authors to identify the literature which addresses the research question. Clear and defined inclusion and exclusion criteria puts the author on the right track to getting strict and relevant information for the study.

Authors narrow down their searches with use of Boolean operators like "AND" to find sources that contain more than one keyword i.e., this thesis has been used as a nurse's safety "AND" Home hospital. "OR" is used to find sources that contain one of a range of synonyms i.e., aggression "OR" violence among nurses in home care, when articles are found, authors read the abstract and pick out those most relevant to their research. (McComber 2019).

When search terms addressing the research questions were identified with the help of inclusion and exclusion criteria, (seen on table 1 below), authors made an advance search by identifying databases such as CINAHL with full text (EBSCO), Elsevier, PubMed, and Google Scholar, full text and abstract inclusive. Authors got the most relevant articles that will answer all the research question. Final search terms were ("Home care Nursing" And Occupational safety).

Inclusion	Exclusion	Rationale
Nurse's safety	Not patient's safety	Nurse's safety is searched evidently less than patient's safety, so this literature aims to improve nurse's safety and well-being.
Home hospital	Not home care, hospital, or other nursing environments.	At home hospital nurse encounter lots of risky factors.
Journal articles in both English and Finnish language	Not other languages	Practical reason
Journal Articles with time frame of 2010-2021	Not older than 2010	To provide latest information
Journal articles available with full text	Not literature with incomplete text	Practical reason

Table 1: Inclusion and exclusion criteria

After identifying inclusion and exclusion criteria, relevant literature was selected from following databases such as CINAHL, PubMed, Elsevier, and Google scholar. Each selection criteria were used by authors to search for information in all above mentioned databases. They ended up with 10 most relevant articles. Selection processes are demonstrated below (Figure 1).

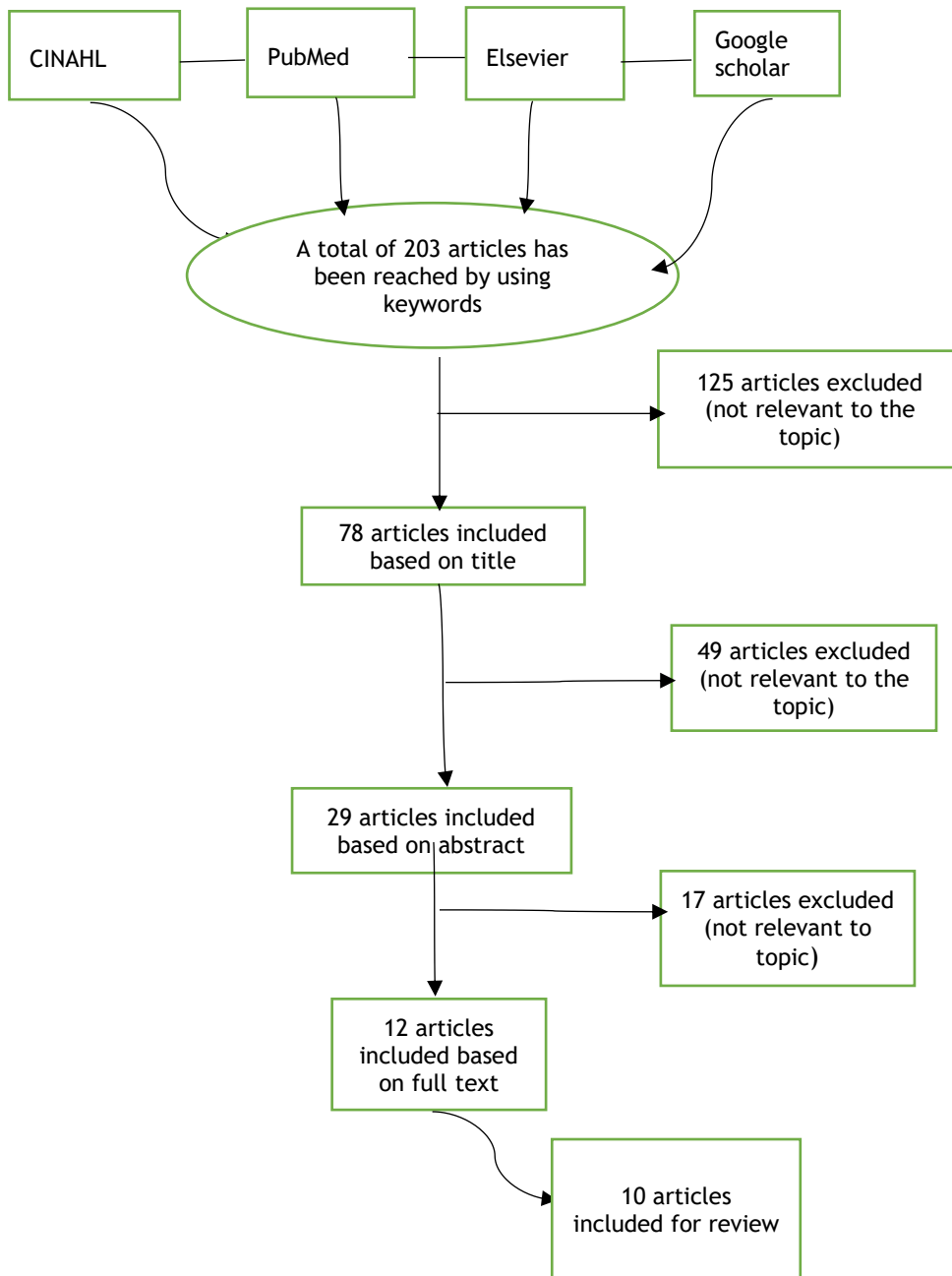


Figure 1: Selection criteria

#### 5.4 Data analysis

Inductive data analysis is adopted by authors to collect data used in developing concepts, hypotheses, or theories. Deductive data analysis test hypotheses as in rationalist research. Data analysis is the process of making data comprehensible. It involves integration, reduction, and interpretation of what people have said, seen and read. Data analysis is a complex procedure that requires moving back and forth between specific piece of data and abstract concepts, inductive and deductive reasoning, description, and interpretation. These meanings, interpretations or perceptions establish the findings of the study. Findings can be in the form of systematic descriptive reports, themes, or categories that extract from data or in the form of models and theories that explain the data. Data analysis is the process used to answer research's questions. (Merriam & Tisdell 2015)

After reading journal articles and documents found, the authors wrote down notes, comments, and took note of them. The process of taking notes of potentially appropriate, relevant, and important data that answers the research question is also called coding. The authors are open to selecting important raw data because it is possible at this point to identify component of each data that might be useful. This form of coding is often called open coding. The authors took note of the exact words, sentences and concepts found in the literature. (Merriam & Tisdell 2015)

Determining codes to pieces of data is how authors begin to make categories. Categories are conceptual parts that cover individual examples of the category. For Authors is a challenge when constructing categories or themes that get some constant pattern that cover their data. It should be explicit that categories are concepts taken from the data. (Merriam & Tisdell 2015)

The authors review and go back over all transcripts and notes(codes), to classify and group those notes and comments that are like each other. The authors develop some categories using the constant comparative method in which combining codes from open coding into fewer, more reprehensible categories. The process of grouping open codes is called analytical coding. Analytical coding is a coding that comes from interpretation and reflection on meaning. (Merriam & Tisdell 2015)

In this thesis the authors first read those 10 selected articles (See table 2 below), several times carefully, then focus on the data that answers the research question. The authors got information about 'What are the factors that promote nurses' safety in the home hospital environment?' and 'What are the factors that hinder nurses' safety in the home hospital environment?'

The ten research articles reviewed came up with this report. The following sections answered the research question of factor hindering, factors promoting and what nurses can do to stay safe in the home hospital environment. Content analysis of the articles left the author with five descriptive categories of factors hindering nurses' safety in the home hospital environment.

- Hindering factors due to geographical location.
- Hindering factors due to settings
- Hindering factors due to patients and family members.
- Hindering factors due to the nurses themselves.
- Hindering factors due to the home care organizations.

The result we got was further broken down into subcategories. Some of the subcategories found included, weather conditions, unfavorable working conditions, work related musculoskeletal disorders, lack of equipment, Injuries that come from sharps, workplace aggression, exposure to secondhand smoke, pets and environmental pollution, equipment handling and disposal, attitude of the nurses, staff motivation and education. This can be seen below on figure 2.

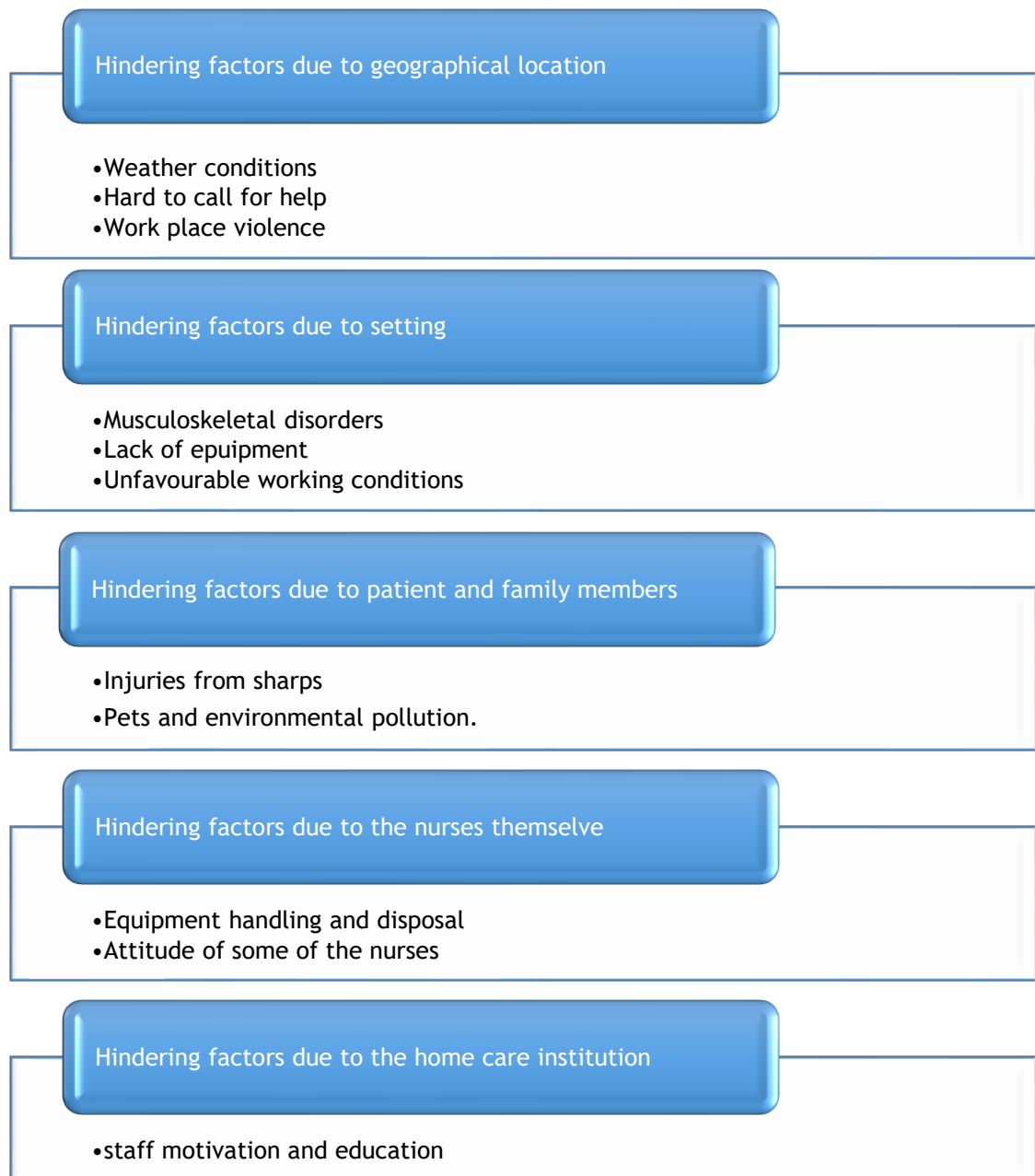


Figure 2: Hindering factors.

## 6 Factors Hindering Nurses' safety

Lots of factors hindering nurses' safety in the home hospital environment were noted but also a few factors that promote the safety of nurses in the home hospital could be located. These findings were grouped into three main categories; the duty of the health care sector to keep nurses safe, the duty of the care institutions and finally the duty of the nurses themselves. These main categories were further divided into subcategories which included use of sharps

modification, better working equipment, education and training of staff, vaccination, and precautions, reporting and attitude of the nurse. (See Figure 3 below)



Figure 3: Promoting factors.

#### 6.1 Hindering factor due to geographical location

Some of the articles identified safety hazards due to geographical location as being important when it came to keeping nursing at home hospitals safe. Winter night driving conditions also posed a risk to home hospital nurses. (Wong, Saari, Ern, Puts & Tourangeau. 2017). Threat of violence caused by challenging neighborhoods plus the difficulty of nurses to call for backup. (Pia, Galligan & Quinn 2017)

Recent research (Pia et al. 2017) has demonstrated that violence, sexual harassment, and sexual aggression often happens in home care. The experience of workplace violence can overwhelm the nurse at home hospital resulting in a prolonged stress. This kind of stress might lead to poor mental and physical health outcomes. Even so, severe form of workplace violence, verbal aggression and non-physical violence are strongly related to negative health outcome for employees. Aggressive or uncooperative patients can cause sharp injuries.

#### 6.2 Hindering factors due to the setting of hospital at home

All the articles chosen for this review identify safety hazards due to the setting of the hospital at home as essential reasons why nurse's safety at the home hospital environment may be affected. This could either be due to unfavorable working conditions, psychosocial



hazards, work related musculoskeletal disorders or lack of equipment due to the home location of the hospital.

At home hospital, nurses are exposed to aggressive pets, environmental tobacco smoke, oxygen equipment, unsafe neighborhoods, and pests. They are equally exposed to communicable diseases and unsafe chemicals (Wong, et al. 2017) but unlike hospital or long-term care settings, home hospital care is delivered in a less controlled environment with potential sanitation hazards and fewer resources (Shang, Chastain, Perera, Dick, Fu, Madigan, Pogorzelska, Maziarz & Stone 2021). According to Pia et al. (2017), ergonomic issues was ranked as one of the most frequently experienced HC hazards.

Nurses at home hospitals may face a unique challenge when it comes to preventing and controlling infections, which most possibly will spread during an infectious disease outbreak (e.g., SARS-CoV-2 or COVID 19) (Shang, et al., 2021). Shang et al. (2021) concluded that many agencies have limited capacity to respond to infectious disease outbreaks. Staff and personal protective equipment shortages remain major concerns. He also mentions how in the USA for example as in most parts of the world, most agencies did not have a full-time infection prevention staff by the time of the COVID pandemic.

According to Anderson, Hilaire and Flinter (2021) nurses who work in home care have approximately three times more lumbar complaints than their colleagues working only in health centers. As stated by Pia et al. (2017), insufficient height could cause the nurse to get lumbar complaints. Low bed height forces nurses to unfit posture that can very easily lead to musculoskeletal problems. According to Daraiseh, Genaidy, Davis, Karwowski, Stambough & Huston (2010) dissatisfaction with specific working conditions may lead to musculoskeletal symptoms.

As stated by Pia et al (2017), the most common musculoskeletal injury associated with patient handling is slips, trips, or falls (falling on icy stairs, snowy walkways) outside the home. Some nurses thought that the pain is related to their work, as physical home space limits the use of high-tech devices. Even though low-tech devices such as grab bars, shower chairs/bench, adjustable beds just to name a few, can improve both caregiver and patient safety.

### 6.3 Hindering factors due to patient and family members

The studies identify that administering nursing health care in the home presents with different challenges from those in other health setting such as hospital and other medical institutions. Patients as well as their relatives could pose a safety threat especially from the perspective of injuries that come from sharps, work aggression, exposure to secondhand

smoke or pets. At home hospital, nurses are also exposed to bloodborne pathogens, such as Hepatitis B and C and HIV (Brouillette et al. 2017).

Care workers are always placing the care of a patient who smokes above all, thus putting their own health and well-being at risk. Potential for personal harm from environmental agent such as secondhand smoking (SHS) was also a major concern. Poor air quality was reported as a hazard by 87 % of workers from one article and studies identified specific situations where risk exposure during home visit maybe greater due to patients with dementia. At the home hospital oxygen equipment risks faced by nurses may be related to indoor smoking (Brouillet et al. 2017).

#### 6.4 Hindering factors due to the nurses themselves.

When talking about nurses' safety in the home hospital environment, it is necessary to consider all factors including those that are brought about by the nurses themselves, these range from poor equipment handling to the attitude of the nurses at home hospital. Needlestick injury (NSI) will be one example, it is one of the safety hazards at the home hospital with a significant proportion of transdermic injuries occurring during the handling and disposal of the needle (McConville, Hegarty & Davis. 2018).

The increasing concern is highlighted by reports that 35 % of nurses suffered at least one injury with a previously used sharp during their home health care (HHC) career. Some nurses may even overfill the safety box and forget to replace them. This might lead to them placing the shards within normal plastic bags ill-equipped to deal with potential needle puncture; it also presents as a clear hazard for the workers collecting domestic waste. Skin puncture from a protruding needle will expose the nurse to the possibility of blood-borne pathogens (BBPs) and the gravity of the injury may be underestimated, as such there may be no serological testing or post-exposure prophylaxis. Therefore, it is important for the nurses to be sensitized since the consequences of a delay in follow-up could be life threatening. Furthermore, a survey carried out by community nurses in 2009 discovered a variety of negative attitudes towards the use of safety devices, some nurses thought they were too difficult to use, did not work well or simply time consuming to apply (McConville et al. 2018).

#### 6.5 Hindering factors due to the home hospital organization

Home hospital institutions have room for improvement when it comes to keeping their workers safe. As far as staff motivation and education is concern, not many articles reported on this but the few that did, mentioned nurses putting their health and wellbeing at risk; some nurses mentioned feeling abandoned by their employer with regards to finding solution in everyday home nursing care. It is therefore necessary to develop preventive safety policies, procedures and provide additional training for the home care staff. Training should be

designed to increase confidence and capacity to plan for safety, reduce violence and harassment (Hanson, Perrin, Moss, Laharnar & Glass 2015).

## 7 Factors promoting nurses' safety

Home hospital care is increasingly growing in many parts of the world and considering that homework environment can be unpredictable, it is important to find out ways by which nurses working in these institutions can stay safe and healthy so they can provide the best possible care for their home hospital patients. According to information gathered from the articles, the responsibility of keeping the nurses safe can be put in the hands of the health care sector & policy leaders, home health care institutions and finally the responsibility of the nurses themselves.

### 7.1 Responsibility of the health care sector and polity leaders

Some of the literature studied has helped to advance the knowledge on measures to stay safe in the home hospital environment. Preventive interventions for sharp injuries should be aimed at eliminating sharp use by development of needleless medical devices and procedures. In the meantime, sharps with engineered sharp injury protection (SESIPs) should be used at home hospital while home care agencies and nurses providing services for home hospital agencies should be given occupational safety and health training on sharp injury prevention and protection. (Brouillette et al 2017).

Implementing certain equipment better suited to difficult care such as introducing winglets for injections that are particularly difficult to perform and encouraging assistance between home care workers, as the procedure demands (e.g., lifting heavy patients) through adequate organizational measures. Proper coordination and consideration of each person's constraints is fundamental to efficient operation of the structure. (Van de Weerd & Baratta 2012).

Some home care nurses have expressed their need for a better care system. According to them, developing the home care models can be done by educating future generation of nurses to be ready for advanced practice in home hospital nursing and administration. (Jarrin, Pouladi and Madigan 2019)

### 7.2 Responsibility of the home care institution

The goal of every health care institution among others should be the continuous improvement of care. This can be achieved by promoting nurses' safety through continuous training of their staff. It can be designed to increase confidence and capacity to plan for safety, establish and maintain appropriate work boundaries, de-escalate violence and harassing situations. It

should be noted that, confidence can play a role in reducing the autonomic response to fear before, during, or after a stress-induced experience. Confidence can also help to prevent and respond to violence and harassment, and this can weaken the impact of verbal aggression or burnout. (Glass, Hanson, laharnar, Moss and Perrin 2015)

Nurses can also be trained on the skills to use to establish work boundaries; and techniques to resolve conflicts that may arise during scheduling, work expectations, or performance. Increasing patient, employers and homecare workers knowledge, skills, and resources to effectively prevent and respond to harassment and violence will likely increase the homecare workers confidence and reduce their fear of future harassment and violence. (Hanson et al 2015). Strategies that HC organizations may adopt to increase staff security while visiting patients include frequent communication, so that the staff can be informed of each other's location. If possible, security escorts can be used during home visits in unsafe neighborhoods (Wong, et al. 2017)

According to other articles, some staff vaccination rates were higher than 95 % during the last flu season (Shang et al.2021). Only 26.6 % of the agencies require staff flu vaccinations to work, and over half offer flu vaccination to their staff for free. Even so, at least half of the agencies have a policy prohibiting staff from wearing artificial nails. (McConville et al.2018).

Judging from these figures it will be of great help if all home hospital institution will copy their example and put in place every major there is to prevent their home hospital nurses from getting infected while in patients' homes. Managers should recognize the worker's relational and effective dimensions. It is therefore necessary to have work-related dialogue, job satisfaction, social support, etc. while keeping in mind that proper coordination and consideration of each person's constraints is fundamental to efficient operation of the structure. (Van de Weerd & Baratta 2012).

### 7.3 Responsibility of the nurses themselves

When it comes to injuries from sharps, the nurses have the responsibility to report as soon as possible so that prophylactic treatment can be administered. (Brouillet et al.2017). Considering that nursing can be very emotional, nurses express the emotions felt from patients to their work mates after their home visits. Positive emotions at work felt by the nurses are most often linked to regression of patient's disease, quality of their relationship with the patient, their feeling of helpfulness, success of technical procedures leading to less pain for the patient, the patient being able to accept his/her state of health and the care administered (Van de Weerd & Baratta 2012). Van de Weerd et al. (2012) concluded that for nurses to prevent occupational as well as psychosocial hazards, they have the responsibility to gather knowledge of work constraints alongside encountered difficulties. With this knowledge, they can help improve their working conditions.

## 8 Discussion.

The purpose of this literature review was to describe the factors that promote and the factors that hinder the safety of nurses in a home hospital environment. Ten research articles were considered relevant and selected for this study. Findings were analyzed and grouped into main and sub-categories. While analyzing the data, five major categories (Figure 2) were identified for factors hindering and 3 Major categories for factor promoting (Figure 3).

As for safety issues brought about by musculoskeletal problems, it is essential to minimize complaints in the lumbar region, nurses should avoid working with forearms in a posture that put arm angle between  $60^{\circ}$  and  $100^{\circ}$ , instead, they should use their arms at an angle between  $20^{\circ}$  of extension and  $20^{\circ}$  of bending. This is to help reduce the pressure created on the lumbar spine. (Carneiro, Braga & Barroso 2017). HHC nurses on their part should practice preparing a clean and safe work area before starting procedures involving the use of sharps. It is important for them to check and ensure that the sharps container is empty and safe for use before leaving for home visits. They can also practice using blood born pathogen (BBP) exposure control plan, free from distractions and using standard precautions. (Pia et al. 2017). Nurses should be prepared for a sudden movement from the patient or distractions from other family members e.g., keeping a hand on the device while the patient is shaking or moving, ensuring safe work posturers by putting patients in a position they are comfortable with or putting heavy patients on a laying down position before sharps insertion. It will be wise to clear the room of all other family members before the procedure if possible. Moreover, the education of patients and families plus nurses' communication skills on safety in HHC environment is imperative. (Pia et al. 2017). Some study found that home care agencies should provide occupational safety and health training concerning sharp injuries prevention and protection as claimed. Effective public health intervention including new medical device to remove sharps, changing clinical policies and sharp safety practices should be implemented. (Brouillette et al. 2017). Concerning sharp injury, other study indicated that use of micro needle patches can limit the risk of blood-born pathogen and needle stick injuries considerably. When the area of micro needle in contact with tissue is very small, the liquid-holding capacity will be very small too. (McConville, Hagarty and Davis, 2018). Working condition could be improved by greater knowledge of work limitation. Expression of encountered difficulties can prevent occupational and psychosocial hazard. (Van De Weerd & Baretta, 2012). Furthermore, in other to improve safety, safety policies of the agency should be developed, implemented, and reviewed annually. Policies for blood- born pathogen exposure control plans, safe patient mobilization/handling practices, violence prevention,

and oxygen therapy safety should be considered. In addition, establishing and monitoring injury, reporting system where employees can report hazards, injuries, identify and solve problems is useful. (Pia et al. 2017)

### 8.1 Trustworthiness

Trustworthiness in qualitative research refers to methodological validity and suitability. Researchers consider trustworthiness of study by developing dependability, credibility, transferability, and confirmability. The most significant of these is credibility. (Holloway & Wheeler 2009)

Despite the type of research, the authors approach the validity and reliability of research by rigorous attention to studies' comprehension and manner of data collection, analyzed, and interpreted and the way in which the findings are demonstrated. (Merriam & Tisdell 2015).

#### Dependability

Dependability refers to consistency and accuracy of the research. (Holloway & Wheeler 2009) In this research the whole process of the thesis is clearly documented. Each Step of study including methodology, inclusion and exclusion criteria, search term and the process of searching, content analysis, critical appraisal and result has been elaborated. The study might be repeated and achieved same result under same circumstances.

#### Credibility:

To ensure the credibility of this work, triangulation method has been used. According to Denzin's (1978) there are 4 types e.g., the use of multiple method, multiple resource of data, multiple investigators, or multiple theories to confirm achieved findings. (Merriam, Tisdell 2015)

In this thesis authors used multiple and reliable databases. The authors utilized only scientific and evidence-based articles. The whole process of research including topic of research, methodology, inclusion and exclusion, data analysis and result has been conducted under the supervisor's guidance and feedback. In addition, both of author read and analyzed independently and they concluded and finalized the findings together.

#### Transferability

Transferability refers to generalizability of the research. This implies that the findings of one context can be transferred to similar circumstances (Holloway & Wheeler 2009). To ensure transferability the authors utilized proper inclusion and exclusion criteria to limit the bias and developed unprejudiced approach for data selection. Despite of using different databases and

articles from different countries concerning nurse's safety the authors found out almost the same result from the research.

#### Confirmability:

Confirmabilities indicate the term of objectivity. It implies that the researchers don't achieve and conclude findings based on their own assumption and preconception. (Holloway & Wheeler, 2009). To avoid prejudiced and bias and increases objectivity the articles has been selected by strict inclusion and exclusion from reliable databases offered by Laurea university of applied science. The whole process of selection has been documented with rationale and only articles selected that are most relevant and answer research question, thereby the articles has not been chosen by authors' personal judgment issues.

#### Limitation

This study reviewed factors that improve nurse's safety and factors that hinder nurse's safety. By analyzing 10 articles authors found out significant findings concerning nurse's safety, however this study is not a systematic review, and all relevant articles are not included in this research. Regardless of that the study was limited by the methods used in the selected studies, lack of prior studies, lack of adequate sample size and inability to generalize the research finding. Some researchers need to study further such as preventive OSH interventions developed for hospital and skilled nursing facilities can serve as a model for HHC, but need adaptation for home condition, consequently new solutions planned for the specific delivery of care at home are also needed. Some study found second-hand smoke as a risk factor and recommended e-cigarette, which is likely less harmful than secondhand smoking (SHS), but the study didn't review the possible harm of e-cigarette. Moreover, the number of participants in some studies were limited.

#### Ethical consideration

Avoiding plagiarism by citing sources of information. Topic was well mastered and special note was taken of all the key words which has been carefully studied. Good, reliable, and relevant concepts where used. It is important to be accurate, open, and honest about findings, it was important to stay neutral when collecting information, Personal opinions or experiences where avoided and citing have been used to confirm.

#### 8.1.1 Conclusions

Homecare as one of the health care services are increasing globally as the world population ages. Residents as well as patients feel comfortable when they get the same care in their own home. Regardless of that the nurse's safety is important too and it is necessary for them to feel safe and secure while giving care to the patient. They should be able to deliver care

without any trouble, stress, or injuries. Unfortunately, Nurses encounter a lot of hindering factors at their home working environment, and safety policies in the home health care setting are considerably less noticed. Our thesis puts serious emphasis on the need to conduct more research especially on agency safety policies with regards to home health care. In addition, it was noticed that many safety risks are caused by a lack of standard preventive models, insufficient management, unsuitable training for nurses as well as their patients, and unfavorable working condition. We conclude that Homecare nurse's safety should not be ignored as there is a growing need of homecare nurses who provide care to patients at the comfort of their own homes. Consequently, the nurse's safety should be ensured prior to their leaving the work environment and burn out feelings need to be avoided.



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## Appendixes

## Appendix 1: List of 10 Selected articles

Table 2: List of 10 Selected articles

	No.	Articles Retrieved	Data base link
1.	Jarrin,O., Pouladi, F., Madigan, E. 2018	International priorities for home care education, research, practice, and management	CINAHL
2.	Natalie M Brouillette 1, Margaret M Quinn, David Kriebel 2017	Risk of Sharps Injuries to Home Care Nurses and Aides	PubMed (laurea.fi)
3	Won Matthew, Saari Margaret, Patterson Erin, Puts Martine, Tourangeau Ann E. 2017	Occupational hazards for home care nurses across the rural-to-urban gradient in Ontario, Canada.	EBSCOhost)
4	Jingjing Shang , Ashley M Chastain , Uduwanage Gayani E Perera , Andrew W Dick , Caroline J Fu , Elizabeth A Madigan , Monika Pogorzelska-Maziarz , Patricia W Stone, 2021.	The state of infection prevention and control at home health agencies in the United States prior to COVID-19	PubMed)
5	Aaron McConville , Catherin	Assessing the Potential Impact of Microneedle	PubMed)

	e Hegarty , James Davis, 2018.	Technologies on Home Healthcare Applications	
6.	Pia, M., Galligan, C. and Quinn, M. 2017	Safety Risks Among Home Infusion Nurses and Other Home Health Care Providers	CINAHL
7.	Van De Weerd, C, Baratta, R. 2012	New working conditions and consequences on activity of home healthcare workers	EBSCOhost)
8.	Angus, K, Semple, S. 2018	Home Health and Community Care Workers' Occupational Exposure to Secondhand Smoke: A Rapid Literature Review	Google scholar
9.	Ginger C Hanson, Nancy A Perrin, Helen Moss, Naima Laharnar & Nancy Glass, volume 15, Article number: 11. 2015	Workplace violence against homecare worker and its relationship with health outcome: a cross-sectional study	google scholar
10	Carneiro,P., Braga, C., Barroso, M. 2017	Work-related musculoskeletal disorders in home care nurses: Study of the main risk factors	Elsevier

## Appendix 2: Data analysis of the articles

Table 3: Data analysis of the articles

Article no.	Authors and publication date	Purpose	Sample	Methodology	Findings
1.	Brouillette et al 2018, U.S.A	Risk of sharp injuries among home care nurses and aides.	Evaluate all available literature and develop a pooled estimate of the risk of sharps injuries (SI) among home care (HC) nurses and aides.	Systematic Literature review, random effects model to calculate a summary measure of Sharps Injury risk for nurses and for aides.	Nurses had a 5.25% weighted average risk of experiencing at least one SI in the past year working in HC, hence there is a serious risk of SI among both the HC nurses and aides.
2..	Wang, M., et al. 2017, Canada	Describe occupational hazards for nurses working in home care (HC) and explore how they differ across the rural-to-urban gradient.	R.N in Ontario and Canada used. 14 occupational hazards were individually tested for differences between four geographical settings.	A survey developed from focus group findings and previous literature.	Most recurrent occupational hazards were dangerous or aggressive pets, winter or night driving conditions, ergonomic issues, exposure to oxygen equipment/tanks and environmental

					tobacco smoke exposure.
3.	Jingling et al 2021, United States of America.	Survey to assess infection prevention and control-related policies, infrastructure, and procedures prior to the covid pandemic	Cross-sectional study collected on paper and online, randomly sampled 1506 U.S. home health agencies.	Survey data on the quality of patient care, patient satisfaction, and other agency characteristics	prior to the covid pandemic, infection prevention and control were dissatisfactory among U.S. home health care agencies. Consequently, most agencies have limited capacity to respond to infectious disease outbreaks.
4.	Aaron et al. 2018, U.K	Present state of play in terms of sharps waste within both clinical and home healthcare environments.	Community and home healthcare workers in the USA.	Survey(interview)	considerable need for the design of more effective and accessible safety solutions for the use of needles
5.	Olga et al. 2018, United States of America	International vision for the future of home care education, research,	A Survey on home care nurses	Qualitative content analysis. sampling 50 home care professionals	The need to build evidence base for home care, design better systems of care,

		practice, and management		from 17 countries.	develop leader at all levels and address payment and polity issues
6.	Markkanen, pia, Galligan, C, Quinn, M, 2017, USA	summarize OSH risks in HHC,	Systematic analysis of focus group and interviews of home health nurses and other caregiver with similar working condition.	Systematic analysis.	illustrate importance of OSH risk, BBP hazard, working in isolation, unpredictable disruptions by family member or pets, and lack of assistive devices, etc.
7.	Van De Weerdt, C, Baratta, R. 2012, Prais, France	An ergonomic study conducted at a home	Analyzing working conditions of home healthcare aides and nurses.	Interviews	Recommendations to improve working conditions. e.g., implementing certain equipment items better suited to difficult care etc.
8.	Angus, K, Semple, S. 2018, Scotland	Considered home care worker's exposure to SHS	A rapid review to examine the literature on home health and community	Quantitative research considering home health.	Guide to prevent the harmful effects of SHS on workers in



			cares exposure to SHS.		domestic settings
9.	Hanson, G, C, Perrin, N, Moss, H, Laharnar, N, Glass, N. 2015, USA	prevalence of workplace violence among homecare workers	interviewed to assessing workplace violence.	Interview, survey	preventive safety training programs with policies and procedures should be implemented and developed to support homecare workers.
10.	Carneiro, p, Braga, C, Barroso, M. 2017. Portugal	musculoskeletal complaints in home care nursing, risk of having musculoskeletal complaint in identified region	Analyze and identify work-related musculoskeletal disorders (WMSDs) in home care nurses	Electronic questionnaire to study and test specific group of nurses for musculoskeletal symptoms.	Home care nurses have three times higher chance of having lumbar complaints compared to nurses that work only in Health centers, risk factors forearm posture, static postures, arm posture, etc.