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Pressure ulcer prevention and its implementation in practise – a literature review

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<p>This thesis is a literature review on pressure ulcer guidelines implementation. The aim is to produce information about the implementation of evidence-based pressure ulcer prevention guidelines, describe the challenges met, and identify measures which healthcare organizations can take in order to ease the implementation process. The subject is timely as the revision of Finnish pressure ulcer prevention guidelines took place on October 2015 by the nursing research foundation HOTUS, based on the international guidelines created by EPUAP (European Pressure Ulcer Prevention Advisory Panel) and NPUAP (National Pressure Ulcer Prevention Advisory Panel).</p> <p>Tämä opinnäytetyö on kirjallisuuskatsaus painehaavojen ehkäisy-suositusten toteutumisesta. Työn tavoitteena on tuoda tietoa näyttöön perustuvien painehaavojen ehkäisy-suositusten toteutumisesta aikaisempien tutkimusten perusteella ja kuvata toteuttamisessa kohdattuja ongelmia sekä kertoa mitä terveydenhuollon organisaatiot voivat tehdä parantaakseen toteuttamista. Hoitotyön tutkimussäätiö HOTUS julkaisi lokakuussa 2015 uudistetun suomenkielisen painehaavojen ehkäisy-suosituksen, joka perustuu EPUAP:in (European Pressure Ulcer Prevention Advisory Panel) ja NPUAP:in (National Pressure Ulcer Prevention Advisory Panel) kansainvälisiin suosituksiin.</p>	
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1 Introduction

Prevention of pressure ulcers is a vital part of nursing care and the knowledge of the optimal ways of prevention is important. Detailed recommendations which are based on evidence-based research exist internationally, and have been revised by the two leading research and educational organizations of the field: European Pressure Ulcer Prevention Advisory Panel (EPUAP) and National Pressure Ulcer Prevention Advisory Panel (NPUAP), which works in the United States. These recommendations have worked as the basis for the Finnish guidelines. Revision of Finnish guidelines was published in October 2015 and our thesis is part of that project.

As pressure ulcers are a cause of individual suffering and health care costs, the prevention of them needs to be prioritized. According to Cooper (2013) In the United Kingdom, stage III or IV pressure ulcer has been classified as a never event, indicating that they should never occur. The classification of a never event suggests that the event is entirely avoidable, and would not happen under good-quality care. However, not all pressure ulcers are entirely avoidable but the consensus was reached on a NPUAP conference that most of them are. In addition, specific situations where unavoidable pressure ulcers may occur are also addressed and the need of more specific situational guidelines identified (Black et al 2011).

The prevalence rates of pressure ulcers are still high and they produce lots of costs to health care. As stated by Soppi (2006), prevention of pressure ulcers is estimated to be cheaper than treating the consequences. It is also worthwhile to mention that according to Finnish Nursing Research Foundation, over 60% of pressure ulcers go unnoticed in Finland. Pressure ulcer development is shown to result in reduced physical and mental functions, reduced vitality and increased pain, and they impact heavily on quality of life and on mortality (White 2014). Also the cost of litigation is rising (White 2014). The overall incidence of pressure ulcers in Finland is approximately 14-15% and 10% if the grade 1 pressure ulcers are being left out (Soppi 2010).

The new guidelines were published in Finland October 2015. To ensure that the recommendations are implemented well into everyday nursing practice in healthcare facilities, research needs to be done about the implementation. In this thesis we try to find out how

the implementation has worked internationally and find out the possible barriers during implementation and assess the possible effects of the circumstances. We are making a literature review and combining and analyzing the existing research so that it can serve as a platform for future research. In Finland there seems to be no previous research done about the implementation of guidelines.

2 Pressure ulcers as a health care problem and significance of pressure ulcer prevention guidelines

2.1 Pressure ulcers

A Pressure ulcer is an injury which can break the skin and underlying tissues. They are the cause of much discomfort, pain, prolonged illness, prolonged hospital stay and heightened care costs. Treating pressure ulcers becomes more expensive as the ulcers worsen, and so does patient's situation. (Soppi 2010.) Pressure ulcers have been classified according to their severity. The classification has been revised by EPUAP and NPUAP. According to the EPUAP standards ulcers are divided into four categories, from stage 1 to stage 4. A stage 1 pressure ulcer presents as erythema; redness on the surface but no breaks on the skin. In stage 2 there is a superficial tear of the skin. In stage 3 a tear goes through the whole skin but does not reach to bones. In stage 4 the tear goes under the skin and reaches the bone. (EPUAP guide to prevention of pressure ulcers 2009.)

The prevalence of pressure ulcers is persistent, even though it has been stated that the most of them are avoidable (Soppi 2010). 13% of acute care patients, 16,5% of long-term care patients and 22% of home care patients are shown to have pressure ulcers (Soppi, Iivanainen & Korhonen 2012). Over 60% of pressure ulcers in Finland go unnoticed. The costs caused by pressure ulcers in Finland have been evaluated to be approximately 2-4 % of the annual healthcare costs. (HOTUS 2014.) It is essential to improve the prevention of pressure ulcers since the prevention is estimated to be cheaper than treating the consequences (Soppi 2006).

In Finland pressure ulcers are classified as a HaiPro-incident. HaiPro is an anonymous, voluntary reporting system of patient safety incidents, created to improve patient safety which is also firmly connected to the nursing staff safety (Knuutila, Ruuhilehto & Walle-

nus 2007.) According to The Nursing Research Foundation HOTUS and Patient Insurance Centre, between the years 2007 and 2014, 40 to 50 HaiPro-reports about pressure ulcers had been made. Every fourth of these reports has led to repayments (HOTUS and Patient Insurance Centre 2014). However, it has been estimated that only 60% of pressure ulcer incidents actually even get reported (Soppi, Iivanainen & Korhonen 2012).

Common risk factors for an increased risk of pressure ulcers have been identified. These are immobility, friction and shear, moisture, incontinence, poor nutrition, perfusion, age, skin condition, and altered level of consciousness. Patients at risk should be identified by pressure ulcer risk screening soon after admission to a healthcare setting. Risk screening should be done under the supervision of a registered nurse or health care professional. (Stechmiller et al. 2008.) Risk group includes patients with impaired mobility like elderly people, patients with spinal cord injury or intensive care patients (JBI 2008). Risk assessment should be performed using a validated instrument and it should be suitable for the patient group in question. Risk assessment must include the following: activity, mobility, and skin condition. Regardless of what instrument is used, clinical assessment is necessary. (HOTUS 2015.)

2.2 Prevention

The prevention of pressure ulcers is an important nursing intervention in every healthcare setting. According to EPUAP and NPUAP (2009) each healthcare setting should establish own policy for risk assessment. They should have a structured approach to risk assessment relevant to that health care setting, targeting clinical areas including the timing of the risk assessment and reassessment, documentation of risk assessment and communication of required information to the wider healthcare team. In addition, the recently published Finnish research foundation's HOTUS guideline is also addressing the importance of social and health care organizations having operational guidelines regarding assessment of risk for pressure ulcers, including a skin and tissue assessment procedure (HOTUS 2015.)

Education must be used to ensure the required competence of the care staff in identification of redness of blanching/non-blanching skin, localised heat, swelling, and induration. Patients at risk of pressure ulcers should undergo a comprehensive skin assessment immediately after arriving for treatment, or within eight hours at the latest. In home

care, assessment should be performed during the first home visit. Skin should be assessed automatically while making a risk assessment and whenever the patient is being moved to another place of care or is discharged from one. (HOTUS 2015).

2.3 Pressure ulcer prevention guidelines

Pressure ulcer guidelines are comprehensive and include a lot of recommendations about skin assessment, repositioning and early mobilization, nutrition and education and use of medical devices. Nursing research foundation and European Pressure Ulcer Advisory Panel has published prevention guidelines recently. Also Joanna Briggs institute has published best practice information recommendations about pressure ulcer prevention for healthcare professionals which is suitable for Finnish practice.

2.3.1 Skin assessment and prevention of medical device-related pressure ulcers

Skin assessment should be comprehensive and regular. It should include identifying redness, blanching response, localized heat, oedema and hardness of the skin. It should be known that people with darker pigmented skin are in greater risk of pressure ulceration. Individuals should be asked about for any discomfort and pain, since the pain over the site can be a precursor to tissue breakdown. Accurate monitoring is essential for monitoring the progress of the individual, especially when there is any pain possibly related to pressure damage. (EPUAP and NPUAP 2009.)

Any medical devices should be chosen so that they cause a minimal damage due to pressure or shear and while attaching any tubes, the focus should be on avoidance of pressure to tissues in question. The position of the patient and medical devices should be such where pressure is evenly distributed and shear is alleviated. If it is possible, patient should not be placed directly on top of any medical devices. The position of medical devices should always be adjusted and altered when possible. (HOTUS 2015.)

2.3.2 Repositioning and early mobilization

In addition to a risk and a skin assessment, key priorities in prevention are also repositioning and the use of preventative devices. In NICE guidelines (2014) adult patients at risk of developing a pressure ulcer should be encouraged to change position frequently,

at least every six hours. Adults at high risk should be encouraged or assisted to change their position frequently and at least every four hours. There are pressure distributing devices available and they should be used in adults who have been assessed as being at high risk of developing a pressure ulcer or patients undergoing a surgery or patient who sit for prolonged periods.

When changing positions, the patient's activity and mobility, skin condition, and tissue resilience to pressure should be considered. If the patient's state of health does not allow for a change of position, a pressure-redistributing support surface preventing high-risk pressure ulcers should be used. Change of position should reduce or redistribute pressure on the patient's tissues. If patient is bedridden, repositioning should be carried out with help of cushions, at a 30-degree angle with the patient on left or right side, or using a supine position. Repositioning requires that patients' state of health allow it. When patient is seated he/she should be able to hold balance, which feels good and minimizes pressure and shear on the skin and soft tissues. (JBI 2008.)

2.3.3 General recommendations concerning support surfaces

The support surface should be chosen individually according to the patient's needs. Each time, the appropriateness and functionality of the support surface should be assessed. The repositioning should be continuous despite of the use of pressure-redistributing support surface. The number of bed protection pads and bed sheets should be limited if needed. In case of patient being at high risk of developing ulcer, a high quality foam mattress should be used over a regular foam mattress. When patient is unable to undergo regular repositioning, a dynamic support surface should be used. (HOTUS 2015).

2.3.4 Documentation of pressure ulcer care

Documentation provides evidence that the care planning is appropriate and serves as a basis of the patient monitoring. A structured approach should consist of combining the risk assessment scale with a comprehensive skin assessment and clinical judgement. The establishment of skin-care teams, education programs and care protocols together with risk assessment can reduce the incidence of pressure ulcers. Risk factors identified should always lead to an individualized care plan. Recording all occurrences of pressure ulcers graded two or above to the patient safety reporting system as a local incident can

help improve the clinical practice and patient care. (Chamanga 2011.) Documentation in a structured way may promote the consistent recording of pressure ulcers, which in turn improves the follow-up of nursing results and efficiency. This can improve the nursing efficiency and level of knowledge. (HOTUS 2015.)

2.3.5 Nutrition

Nutrition is an important part of comprehensive care and the prevention of pressure ulcers. The body needs an adequate intake of calories, protein, fluids, vitamins and minerals to maintain skin integrity and preventing tissue breakdown. Known risk factors for pressure ulcer development are compromised nutritional status such as unintentional weight loss, undernutrition, protein energy malnutrition and dehydration. Other risk factors associated with an increased risk of pressure ulcers are low body mass index (BMI), reduced food intake and impaired ability to eat independently. (Dorner, Posthauer & Thomas 2009.)

Early nutrition screening and assessment is important to identify the risk of undernutrition which may result in pressure ulcer development and delayed healing. Initial screening should be done by a qualified healthcare professional and then referrals to the appropriate professionals can be done for further assessment. Mini-Nutritional Assessment (MNA) and The Malnutrition Universal Screening Tool (MUST) are potential screening tools. (Dorner et al. 2009.) NICE guidelines (2014) recommend that nutritional supplements should be offered to adults with a pressure ulcer who have a nutritional deficiency and information and advice about how to follow a balanced diet to maintain an adequate nutritional status. Nutritional supplements or subcutaneous or intravenous fluids should not be used to treat a pressure ulcer in adults whose nutritional intake is adequate.

2.3.6 Education of health care staff

The knowledge and attitudes of health care staff regarding the pressure ulcer care and prevention should be updated systematically. A reliable and valid scale should be used for competence assessment. The organization should have an evidence-based education plan for the staff which should be based on assessment on one's competence regarding pressure ulcer care. Education should be offered and carried out as a regular

basis, taking the requirements of the organization and staff into consideration. (HOTUS 2015).

2.4 Evidence-based guidelines and their formation internationally and in Finland

Guidelines of pressure ulcer prevention have their basis in evidence-based nursing care. The aim of evidence-based nursing is to answer the health care needs by using methods whose effectiveness are evidence-based (STM 2009). The figure 1. shows a model created in the Joanna Briggs Institute to depict what evidence-based nursing is and how it is in relation to other aspects of health care.

To ensure and help the evidence-based care, guidelines have been created to guide professionals, teachers, students, patients, their next of kin and decision-makers at multiple levels: managerial, staff and national level. By a definition, guidelines of care are statements and resolutions about the implementation of care, made by experts in a systematic, scientific manner (HOTUS 2015).



Figure 1. The Joanna Briggs institute model to depict what evidence based nursing is and how it relates to other aspects of health care

An evidence-based guideline is a set of recommendations which gathers the best evidence possible on the subject as its principal aim. It helps the working methods to be “effective, meaningful, and safe for the patient, and cost-effective for both the patient and society.” (HOTUS 2015). The revision of Finnish pressure ulcer prevention guidelines that took place on October 2015 has been based on the international guidelines created by EPUAP and NPUAP.

3 Purpose and aim

The purpose of this thesis is to describe the implementation of pressure ulcer prevention guidelines regardless to health care setting where the implementation took place. Our aim is to bring new information about the implementation of the guidelines and make the new Finnish guidelines easier to implement for the health care professionals. It should help them to bring the evidence-based recommendations into the practice and advance the quality of nursing. We decided not to put an emphasis on a certain type of institution whether the research took place in a hospital, home care, acute care or a service institution but rather to describe the implementation as generally. Our research is focused on answering three research questions: 1) What kind of previous research exists on the implementation of pressure ulcer guidelines? 2) What are the challenges in implementation of pressure ulcer prevention guidelines? And 3) How organization can foster the implementation of pressure ulcer prevention guidelines?

4 Methods

4.1 Literature review as a method

A literature review is a method to identify, analyse and combine the knowledge that already exists and is produced by scientific research. It can be said to be “research done about research” in order to provide an overview and conclusions of the existing knowledge. This serves as a platform for future research (Salminen 2007). This review was implemented as a scoping review. A scoping review is a method of literature review to scope the existing research and give direction for future research (Levac, Colquhoun & O’Brien 2010).

A useful methodological framework for scoping studies was created in 2005 by Arksey and O’Malley. More recently, the framework has been revised and enhanced by authors Leva et al. According to Levac et al, the methodological framework of a scoping study can be divided into stages as follows: Stage one is clarifying the aim and purpose, and linking the purpose and research questions. In stage two, the scoping process is balanced by the feasibility with breadth and comprehensiveness of the scoping process. In stage three, an iterative approach is used to approach to select studies i.e. implement section process in a repeatable manner so anyone doing the same selection would end

up with the same results. In stage four data is extracted and in stage five a numerical summary and qualitative thematic analysis reporting results, and considering the implications of study findings to policy, practice or research is incorporated. In stage six, the consultation of the stakeholders can be incorporated as a required knowledge translation component of scoping study methodology. (Levac et al 2010.)

To ensure that our original material is high-standard and scientific, we have used an accredited database CINAHL as our article database. We have chosen our search terms so that they produce the most reliable and accurate result. Our research questions and theory base for the subject have guided us towards choosing the best suitable search terms. The exclusion process has been done by two people, which diminishes the possibility of error and bias. The stage 6 in framework presented above is consulting stakeholders, whom in this case could be HOTUS, hospital ward managers, or pressure ulcer specialists. However, in this thesis we have not done the consulting of stakeholders as our thesis as a school project has its limitations in resources.

4.2 Search process

Our search process was based on our research questions and planned carefully. We made the search process systematically, according to good scientific practice. The following phases of systematic search for a literature review have been identified by Elomaa and Mikkola (2006): First, the essential subject or problem that knowledge is needed for is defined. Then concepts included in, or concerning the subject are being defined. In our thesis such concepts would be for example pressure ulcers, prevention, guidelines and implementation. Thirdly, concepts are transformed into search terms and combinations are considered. Then the suitable data bases are chosen and search performed. Finally the result of search is evaluated based on relevance, quality and reliability. (Elomaa & Mikkola 2006.)

The subject of implementation of pressure ulcer prevention guidelines included several important concepts. The most important of them were defined in the introduction of this thesis: pressure ulcers, pressure ulcer prevention, guidelines. After considering and trying few different combinations of search terms we decided on using terms pressure ulcer prevention AND guidelines AND implementation.

We considered the suitable databases. We went through Medic, PubMed and CINAHL. We decided to use the CINAHL database. Using the Finnish database Medic was also part of our original plan, but no matching results were found there. It would seem that research has not been made about this subject in Finland.

Terms	Results	Limitation criteria	Results after
Pressure ulcer prevention AND guidelines AND implementation	128	English language, academic journal, full text available and publication years between 2006-2016	23

Figure 2. The used search words and results from database CINAHL

The search produced 128 results. We out ruled 19 articles based on their headline which did not meet the criteria for answering to our research questions. We limited the publication between years 2006-2016 to out rule outdated and older studies. The articles had to be academic journals, written in English language. It left us with 65 articles. Based on all 65 abstracts, we chose the suitable articles to be read fully. At this point we added the criteria of being available in full text format.

We were left with 19 articles to read. After reading them fully we found that seven articles did not meet the criteria for our research or were otherwise poor scientific quality. In the end, 12 articles were included in the literature review.

4.3 Data analysis

In this study we formulated the results using data-driven content analysis. Content analysis is a common analytical method for qualitative research, because it's seen as a flexible way to analyse research material in text format. It is also a suitable analysing method for systematic literature review. It enables systematic organization and description of research data. The aim of the content analysis is to provide knowledge from the studied subject. The data can consist of already existing text-form documents or gathered group

or individual interviews. The content analysis can be based on theory, when the classification of material is based on already existing theoretical premises, or it can be data-driven, when the classification is based on perceptions raised from the material. (Kylmä, Rissanen, Laukkanen et al., 2008.) In this study we used the data-driven content analysis.

In data-driven content analysis words and expression are categorized inductively based on their theoretical meaning and categories are let to be derived from the data. It is essential to recognize propositions of contents, because they are the key element in describing the studied subject. Content analysis is a multistage process which consists of understanding the overall impression of the data and its detailed analysis by simplifying and then conceptualization. When simplifying the meaningful expressions, their essential contents must remain. However, purpose would be not to repeat the original expression directly. (Kylmä, Rissanen, Laukkanen et al., 2008.)

Quote	Reduction	Category	Upper category
“To assure that knowledge is retained, repetition and practice are necessary. Therefore, education should be organized continuously, presented regularly, and updated frequently” (Beeckmann et al., 2013)	To assure knowledge is retained; education should be organized continuously, presented regularly and updated frequently.	nurse knowledge educational interventions	EDUCATION

Figure 3. Example of a data-driven content analysis that we used in formulating the results.

Similar kinds of expressions are put under the same category. The material and researchers interpretation guide the conceptualization. By connecting the similar categories are made upper categories. This is how cluster of different categories can be made.

This categorizing and forming clusters give answer to study purposes. Data - driven content analysis is based on induction, where is proceeded from individual descriptions to general overview. (Kylmä, Rissanen, Laukkanen et al., 2008.)

5 Results

5.1 Previous research on implementing the pressure ulcer prevention guidelines

When forming our material for the literature review, we went through the existing research on the subject. Our aim was to define and analyse, specifically what kind of previous research exists on the implementation of pressure ulcer guidelines.

There seems to be a reasonable amount of research on pressure ulcer guideline implementation done internationally, as evident by the 74 search results produced by search terms pressure ulcer prevention and guidelines and implementation in CINAHL during the last 10 years. Finnish studies on the subject, however seem to be non-existent as Medic searches provide 0 results. For our final review we analysed 12 articles seen in the table below. The analysed studies have taken place in Australia, the UK and Ireland, Netherlands, Spain, Canada, Germany and Belgium.

Author(s), year, country where the study was conducted	Purpose	Participants (sample size)	Data collection and analysis	Main results	Remarks
Barker, Anna, 2013 Australia	to study the implementation of pressure ulcer guidelines in acute care in 3 metrics: 1) nurse compliance with pu prevention documentation; 2) accuracy of pu risk assessment scoring; 3) use of prevention strategies	prevalence data from point prevalence studies; 270 patients and 4368 patient medical records on patients on medical and surgical wards	9-year cohort study. Data conducted by audits, assessments done by 2 special assessors	significant reduction in pu prevalence during years 2003-2011; compliance with documentation was high; risk assessment and prevention strategies were used more by experienced nurses and underused by usual-care nurses	usual-care nurses underutilised risk assessment and prevention strategies; time restraints and education level effects need further studying; strategies were made but sometimes underused

Paquay L, 2010, UK/Ireland	to study how a patient and family education programme on pu prevention affects the adherence of guidelines and pu prevalence in home-care	Final analysis was performed on the data of 17980 study subjects	pretest/posttest study; statistical analysis comparing pretest sample and post-test-sample	the education programme improved guideline adherence and reduced pu prevalence; nurse's view of the risk status was the biggest factor for implementing prevention strategies	family/patient education is an effective tool in preventing pu's in home-care patients risk assessment seemed inconsistent and requires more protocols
Mesterberends Esther et al, 2009, Netherlands	To investigate dissemination and implementation of guidelines in 6 european countries	In total 51 interviews of nurses in nursing homes	Open-question interview, open coding analysis and literature review	Further research needed about implementation Only Sweden and England carried out monitoring strategies	Monitoring strategies exist at high rate, but not carried out
Kapp Suzanne, 2013, Australia	To study the implementation of guidelines in a home health care setting in Melbourne	Survey of 21 nurses, audit of 218 clients	A pilot study, survey of nurses and audit	Guidelines were well adopted by nurses Low-risk patients did not receive adequate attention from nurses	a pilot approach was found useful in fostering evidence-based care
Beeckmann Dimitri et al, 2013, England	To study whether a clinical support system makes a difference in adherence pu guidelines	4 nursing homes, 11 wards, 464 residents, 118 professionals	A two-arm randomized controlled trial, comparing the effects with or without the clinical support system	Residents got more prevention when seated on chair on the experiment wards No substantial effect on knowledges was seen, but attitudes improved	Knowledge level of professionals remained low, further study needed to find ways to improve knowledge
Buttery J, 2009, UK	Study risk assessment and interventions in implementing guidelines	Patient data of up to 30 000 patients annually (2005-2008)	Data analysis	Significant gaps in basic preventative care harmed the implementation of prevention guidelines; prevention needs to be timely and more efficient	More attention needed to ensure and encourage timeliness of prevention
Newham Roger, 2015 UK & Ireland	Study the staff experience of the process of implementation	72 nurses and health care aides	Thematic analysis on data from 61 surveys and 11 interviews	Guidelines have been imposed but barriers remain	Lack of time and knowledge perceived as a barrier
Pan-corbo-Hidalgo	Determine three metrics: 1) nurses'	40 registered nurses (3-	Survey of 2006 registered and	Nurses holding a university degree obtained	Interventions like special education, research

et al, 2007, Spain	knowledge of existing guidelines 2) level of implementation 3) what professional and educational factors affect it	year university degree) and LPNs (2 year diploma)	licensed practice nurses working at hospitals, primary healthcare centres and elder care centres	higher scores for knowledge and implementation. Taking part in Research and receiving special education also improved nurses' knowledge and implementation.	projects are important interventions to guide nurses' knowledge and actions
Marchionni, C. & Ritchie, J., 2008, Canada	To examine the influence of the organization on evidence-based nursing practice and gain knowledge of two contextual variables (organizational culture and key people leading challenge).	A total 90 surveys were distributed to nurses, 20 nurses (25%) nurses returned the survey.	A quantitative survey of nursing staff on two inpatient units in a large university-affiliated health care centre in Canada.	The pilot study revealed variability in best practise guideline implementation despite the presence of a culture of organizational learning and transformational leadership.	In the both inpatient units, a supportive culture of organizational culture and key people leading change were present. Implications for further studies are offered.
Wilborn, D; Halfens, R. & Das-sen T, 2006, Germany	To examine how pressure ulcer prevention protocols are currently applied in German hospitals and nursing homes in relation to contents compared with the expert standard and the EPUAP and Royal College of Nursing (RCN) guidelines	In total 10683 patients and residents. 8572 questionnaires were evaluated, response rate of 80.2%.	Survey. On a fixed date trained nursing staff gathers data regarding the frequency of pressure ulcers during a prevalence survey	There is no relation between the availability of protocols and pressure ulcer prevalence. Neither is there any relation between the contents and pressure ulcer prevalence. The institutions currently developing protocols have the lowest prevalence rates.	Only two out of the 21 protocols developed in-house are completely concurrent with the expert standard. Higher problem awareness in nurses has led to better outcomes.
Van Herck et al. 2008, Belgium	Study the knowledge-to action gap in Belgian hospitals Compare hospital data to latest evidence-based findings	6030 patients in 22 Belgian hospitals	A systematic review approach, evidence grading, recommendations formulation, algorithm construction, programming of the rule set and application on the database. Two national databases were used	Belgian hospitals frequently failed to provide appropriate prevention care. Significant levels of underuse in pressure ulcer prevention education and use of dynamic systems mattresses.	The integrative use of administrative data and clinical applications is successful method to study the bridge to knowledge-to-action gap in medical practice.

Meesterberends et al, 2010, Netherlands	Study the dissemination and implementation of guidelines in Dutch nursing homes	Interviews of 8 staff members in 8 nursing homes	Semi-structured interviews	Guidelines were often not used in practice, knowledge was lacking, special education was lacking and not obligatory	Education offered by the organisation needs to be prioritized and offered more. PU prevention needs to be seen as vital nursing skill
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Figure 4. Table of previous research done on implementing the pressure ulcer prevention guidelines, after the limitations

The results give insight into the process of guideline implementation and its challenges, but as concluded in later parts of the results section it seems evident that more research is needed especially about leadership and managerial issues. As seen in the table, only Marchionni & Ritchie stated leadership research in their study purpose, and while management was mentioned in many, few studies discussed it in depth.

5.2 Challenges in implementation of pressure ulcer prevention guidelines

When reviewing the articles we found three parent categories that would describe the nature of challenges when implementing the existing pressure ulcer prevention guidelines in practice. They are management, nurse-related factors and work environment. Resources and for example time restrains can also hinder the implementation of different prevention strategies. Relationships between these parent categories are not always easy to separate and they may combine.

Management has a big role in the successful implementation of guidelines and interventions to change clinical practice must address multiple levels in organization, the individual provider, the work team, the organization itself and the larger healthcare system (Marchionni & Ritchie 2008). Managers and leaders have important responsibility for deciding what they want to prioritize among their staff in addition to financial decisions, resource allocation and work arrangements.

Van Herck et al. (2008) states that the organizational-level factors such as the lack of time, infrastructure, support and resources can contribute to non-compliance. Financial limitations can create barriers in implementation of pressure ulcer prevention guidelines.

In Meesterberends et al (2010) lack of money was mentioned barrier for dissemination of guidelines: "The barrier mentioned most often is lack of money for dissemination." Sometimes the barriers to use the prevention strategies may also be dependent on equipment availability and time like Kapp (2013) stated "Barriers to the use of these strategies may be dependent on equipment availability and sufficient time to put the equipment in place".

Managers are responsible for offering education to the staff and monitoring the knowledge levels among staff. Nurses' unawareness and lack of knowledge can hinder the guideline implementation. Also the updating of policies is important task of management level and can lead to better nursing outcomes. Meesterberends et al (2010) find in their study that: "a lack of (qualified) personnel and lack of nurses/nursing assistants' knowledge/education were mentioned as a barrier" and Beeckmann (2013) stated in his study that: "To assure that knowledge is retained, repetition and practice are necessary. Therefore, education should be organized continuously, presented regularly, and updated frequently." According to Wilborn (2006): "It is worthy of note that prevalence is considerably lower where protocols were in the process of being developed or revised. Nursing staff obviously is more aware of the problem in institutions when working on it in teams." and "by developing protocols, discussions about this subject influence the nursing results in a similar way as training or further education do. It is obvious that sensitization leads to an improvement in nursing results".

Monitoring of the dissemination of guidelines and nurses knowledge should be bigger priority in organizational managers. Not to monitoring the dissemination of guidelines and nurses knowledge can hinder the implementation of guidelines. It would seem that the prevention of pressure ulcer is not seen as big priority as should inside the healthcare organizations. Meesterberends et al (2010) state that "successful dissemination of guidelines is the first step actually applying them into the practice, and therefore monitoring the dissemination is essential." Buttery (2009) says that "prevention needs to be prioritized more in terms of monitoring" and Paquay (2010) that "adaption of risk assessment procedures seems to require high priority." More priority towards low-risk patient groups is also needed, because low risk patients received inadequate attention from nurses, and monitoring the risk factor assessment in low risk groups should be done to improve ulcer prevention care (Kapp, 2013).

Other challenges in implementation of pressure ulcer prevention guidelines can be work environment and atmosphere related. Supportive culture together with transformational leading may be key effect in sustainability of best practice guidelines (Marchionni & Ritchie, 2008) and if culture is not supportive, it can hinder the guideline implementation. According to Wilborn (2006): "An important factor when putting theory into practice is not only the nurses' attitude but also the creation of an open, creatively critical working atmosphere amongst the group of nursing staff and other professions involved." Also poor communication between different disciplines can be the barrier in implementing the guidelines in practice. In Meesterberends et al's study (2010) it was pointed out that "barriers to applying guideline recommendations in practice were mostly related to personnel and communication." Wilborn (2006) also states that successful changes in nursing practice requires thorough information to all people's involved and wide agreement amongst the staff.

Implementation of pressure ulcer prevention guidelines can also be subject to nurse-related factors. Outdated knowledge and lack of education can hinder the implementation of guidelines in practice. According to Meesterberends et al (2010): "lack of knowledge and education is a barrier for implementation of guidelines." Also Wilborn (2006) states that: "Sometimes outdated knowledge of nursing staff impedes the implementation of evidence-based practice guidelines." Besides nurses' knowledge and education, individual characteristics like attitudes, awareness and skills of the nursing staff can affect the compliance of guidelines. Van Herck et al. (2008) mentioned in their study that: "individual provider characteristics, such as awareness, attitude, knowledge and skills, importantly affect compliance." and Barker (2013) that "nurses knowledge, attitudes, beliefs and variable amount of training can harm the guideline implementation." Nurses can for example can under-utilize the prevention strategies and underestimate the risk of ulcer development or they can believe that their clinical judgement is superior to use of risk assessment. (Barker 2013.)

Sometimes the factors related to knowledge source itself can hinder the guideline adherence. It can be written in difficult language or be otherwise impractical. Van Herck et al. (2008) state that: "factors related to the knowledge source itself can deter adherence: information overload, form, language, scientific jargon, presentation of recommendations, etc."

5.3 What organisations can do to foster implementation of evidence-based pressure ulcer prevention

Based on the information provided by the research articles in this thesis, several concepts emerged which healthcare organisations can focus on in order to foster and enable the implementation of pressure ulcer prevention guidelines. A level of a healthcare organisation in this case can be seen as the actor upon nursing staff, which can be a unit, a ward, or the entire hospital / nursing home level. Different types of health care organisations and the different management levels naturally vary a lot, with their capabilities and resources, but in this thesis we have focused on answering mainly on what kind needs exist for organisational interventions and actions. Our 12 research articles shows a variety of settings in which implementation of pressure ulcer guidelines has taken place, and present the issues that staff members, especially nurses, are faced with.

Based on our research material we identified 3 parent categories: management, nurse-related factors, and work environment. Even though these categorisations overlap at times and partly, they still emerged as distinguishable components of implementation. The amount and broadness of nurse-related factors that were seen in our research material was substantial. Nurses' attitudes and beliefs were seen as important for the outcome of guideline implementation. The knowledge level of nurses was highlighted in many studies, with remarks that the knowledge was either too low or too inconsistent between different nurses. In terms of what an organisation can do to affect nurse-related factors several concepts emerged.

The power of organisation-offered educational interventions was discussed in several articles, to answer the need created by the lacking and inconsistent knowledge and education level of nurses. Nurses and their work colleagues like health care assistants are educated in schools, colleges, universities and other different types of schools. The education provided during their schooling is just one component of their professionalism. Offering organisation-provided educational interventions is one of the easiest ways an organisation can affect the knowledge and skill profile of its nurses, and in many of our research articles the importance of organisation-supported learning emerged. As stated by Kapp: "Activities directed towards the uptake of clinical practice guidelines should include strategies to support, educate and enable clinicians to practice from an evidence base." (Kapp 2013).

Educational interventions in the articles consisted of training programmes, pilot studies in which nurses were encouraged to participate and give feedback, special training and participating in research. The educational needs were present in several articles: Barker (2013) found that the gap between usual-care nurses and more educated nurses was affecting guideline implementations, and usual-care nurses were under utilising the prevention strategies. Beeckmann (2013) also reported of low knowledge level of nurses.

In a study conducted in nursing homes in Netherlands, Meesterberends et al (2010) found that the knowledge level of nurses was inadequate and they were lacking of pressure ulcer-focused educational interventions offered by organisations for many reasons: financial reasons, prioritization reasons (education was not seen as a priority), and lack of mandatory participation in pressure ulcer prevention education. The study discussed that the model where nurses are free to choose what kind of training they participate in, is not the most functional model since important topics like pressure ulcer care can be left with less attention. "Offering sufficient and obligatory education for nursing home staff and increasing the attention given to PU care in the nursing homes, e.g. by means of organizing efficient wound rounds on the wards, can be the first steps in initiating an increase in the degree of PU guideline implementation in Dutch nursing homes." (Meesterberends et al 2010). They also stated that "Research has shown that passive strategies, such as simply providing educational materials, whether in written form or by mail, have little to no effect in changing practices."

In a Spanish study, Pancorbo-Hidalgo et al found that nurses holding higher degrees were more likely to implement guidelines actively, but that special educational interventions also increased nurses' attitudes and actions. These interventions were special education and encouraging nurses to participate in research. The importance of organisation-provided education was mentioned: "Because education in chronic wound management is important, we recommend active involvement of managers in the organization of education activities aimed at updating nurses' knowledge and skills" (Pancorbo-Hidalgo 2007).

Also a finding from Wilborn (2006) demonstrated the finding that pressure ulcer prevalence lowered when protocols were being revised: it was explained through increased nurse awareness. Wilborn stated that nurse involvement and participating in teams to review protocols, to discuss about the subject and sensitize to the issue were factors that

clearly made a difference in the daily care provided. This again shows the importance of actively engaging workers in the process of implementation. (Wilborn 2006.)

A second parent category in our findings was management. The concept of management is here understood to include different managerial responsibilities and actions, and some of these which emerged in our research as challenges were: poor monitoring, resource managing. In terms of what organisations can do to foster implementation of guidelines through management and managerial actions, subcategories monitoring, work arrangements and prioritization emerged.

Several of the articles highlighted that on workplaces, using and monitoring prevention measures of pressure ulcers was either lacking or not prioritized enough (Buttery 2009, Paquay 2010). Buttery says: "the focus is on measuring adverse events once they have occurred not actually preventing the event occurring." Kapp reported of results showing that especially low and moderate risk groups of patients were not getting enough nurse attention, stating that "low and moderate risk do require structured interventions and close and rigorous monitoring". Barker et al mentioned that integrating documentation into the daily work flow did seem to be influential for nurse compliance with documentation. Arrangements such as this are an important part of managerial work.

The third parent category was work environment. In this context it is understood as a broad category containing subcategories leadership, communications, work atmosphere and workplace/worker values. Meesterberend et al stated that barriers of implementation were mostly related to personnel and communication (Meesterberends et al 2010). These are two things largely dependent on, among other things, strong organisational characteristics like leadership and culture. Wilborn (2006) pointed out that "an important factor when putting theory into practice is not only the nurses' attitude but also the creation of an open, creatively critical working atmosphere amongst the group of nursing staff and other professions involved" (Wilborn 2006). Marchionni et al also called for "transformational leading" in order to achieve meaningful working environments. As prioritisation was mentioned in many articles to be an issue, the prioritisation was either lacking or not strongly enough voiced in the workplace, it would be vital to recognize that when leadership and work culture are strong, priorities are usually clear and well known within employees.

Leadership and culture were discussed more in depth in only a few of the articles. Marchionni et al studied the effect of leadership and culture on guideline implementation by surveying the staff on two Canadian inpatient units. The study found variability in the level of implementation despite culture of the unit and suggested further research about the subject is needed.

6 Discussion

Based on the material included in our literature review, it seems evident that further research about the implementation process itself is needed, and should be focused on certain type of impactors of the process. Research done about the subject internationally has provided us some insight into the implementation of pressure ulcer guidelines, its process and challenges arisen. Most commonly identified challenges have been several: lack of use of the preventative measures, inadequate risk assessment, unsystematic monitoring, communicational problems, resource allocation, work environment, and flaws in the implementation process. Also limitations and inconsistencies in nurse knowledge, attitude and work habits presented strongly. These are affected by not only the direct educational interventions of the organisation but also other characteristics of management and work environment.

The current research does not provide enough material to draw conclusions on how the cultural and leaderships elements in an organisation affect the implementation of guidelines. In line with Meesterberends' conclusion (2010) that pressure ulcer prevention needs to be treated more as a priority by all levels, it can be speculated whether the attitudes in the workplace mirror the attitudes, values and implications of management and organisation. Marchionni & Ritchie (2008) noted: "Transformational leaders, on the other hand, define a vision and communicate organizational values to achieve cohesion among all employees." How strongly the organization's' values and message correlate with better nursing care in regards to pressure ulcer prevention, is an important and interesting question for further research.

Many suggestions for organisation's possibilities to impact the implementation process also emerged from the reviewed material, and were described in the results-section. Most commonly prevalent in the reviewed articles were mentions about educating staff through different interventions, importance of monitoring both inside organisation and on

local and national level, conditions and attitudes in the work place, local protocols and methods of implementation, and managing resources. Leadership and culture were mentioned but not studied closely apart from one article.

Suggestions for further research have emerged in order to help health organisations in the implementation process. More systematic research about the nature and effects of leadership and culture is needed: especially, since the role of strong management is closely tied to many of the themes that were arisen in the studies (education, monitoring, arranging of work). It should be taken into account that the strength of management is always dependent on the leadership culture of the workplace. Therefore, leadership culture of health care workplaces and its effects on the prevention of policies seems to need more research.

Research about educational interventions exists, but needs more focusing: the current research hasn't really focused on this subject in-depth. Also, further studies could be done about the effects of hiring policies, as a change of hiring policies is one way that the organisation can control the staff profile. It would be interesting to see how these hiring policies contribute to the know-how of the staff in and whether it correlates with better outcomes in pressure ulcer prevention.

Finally, our thesis consists of studies made in several different countries and settings; different fields of work like acute care settings, hospitals and care homes were included in the studied articles. The healthcare systems, work culture and education of nurses in these countries and workplaces are different, and these differences need to be taken into account when interpreting the findings.

7 Reliability and ethics

In order to present noteworthy findings, a research needs to be conducted in a manner that follows general scientific quality criteria, is ethical and reliable (Finnish Advisory Board of Research Integrity 2012). The main criteria for reliable research are evaluability and credibility. Evaluability means that the reader is able to follow the phases of research step-by-step, evaluating the process and its reliability. A second criteria for reliability of research, is credibility. The process of analysis and conclusion needs to be logical and well-documented. Careful documentation, a systematic approach and openness in doc-

umentation are important factors. The credibility is ensured by accurate reporting, systematic reporting of the methods and steps of the research, and citation of sources (Finnish Advisory Board of Research Integrity 2012).

A third criterion for reliability of research is repeatability of research (Salminen 2007). The repeatability means that if the same research was done by another person, the same results in every phase would be found and conclusions would be same. A useful tool for conducting and documenting a research step by step is Fink's model (Salminen 2007). The Fink's model explains in detail the every step of conducting a literary review: the research questions, choosing of a search base, choosing the adequate search terms and systematic inclusion criteria to out rule unsuitable search results. The model stresses the reliability and validity of the research that is integrated in every step of the research implementation.

To ensure evaluability, we have presented the whole search process and how the material that was chosen. To form our theoretical framework and knowledge, we searched through different databases like CINAHL and Ebsco, which both are reliable sources. Because credibility demands carefully chosen articles from a good source, we searched our articles from CINAHL. The search process is documented to its own section, and cited references are documented throughout the whole paper. However, the broadness of our material has been influenced by the fact that we do not have access to all articles at CINAHL because many of them are not available to us free of charge. Valuable information could have been among the articles that were left out.

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Framework for Analysing Research Data

Figure 5. Framework for Analysing Research Data. EXAMPLE.

Author(s), year, country where the study was conducted	Purpose	Participants (sample size)	Data collection and analysis	Main results	Remarks
Hautamäki-Lammien et al., 2008, Finland	To describe patients' notions of sexuality and experiences of the effect of cancers on sexuality and couple's relationship	Patients (n=20) including 12 males and eight females of a department of oncology at a university hospital	Theme interview, inductive content analysis, forming categories	Three categories were identified: 1. <i>Significance attached to sexuality</i> : partnership, tenderness etc. 2. <i>Change in sexuality</i> : attractiveness, physical symptoms etc. 3. <i>Change in couple's relationship</i> : whether it deepens or deteriorates.	Gained knowledge of a topic scarcely studied in nursing science; results may be utilised in developing patients' and their spouses guidance and support at hospital



Pressure ulcer prevention and its implementation in practice - a literature review

Rosa Loikkanen, Mariam Tammi

Background

Revision of the Finnish pressure ulcer prevention guidelines took place in October 2015 by the Nursing Research Foundation HOTUS. The guidelines are based on the international recommendations of European Pressure Ulcer Prevention Advisory Panel EPUAP and National Pressure Ulcer Prevention Advisory Panel NPUAP. The aim is to produce information about the implementation of evidence-based pressure ulcer prevention guidelines.

Purpose and aim

Aim is to bring new information about the implementation of the guidelines and make the new Finnish guidelines easier to implement for the health care professionals. Study answers to three research questions:

- What kind of previous research exists on the implementation of pressure ulcer guidelines?
- What are the challenges in implementation of pressure ulcer prevention guidelines?
- How organization can foster the implementation of pressure ulcer prevention guidelines?

Results

There are reasonable amount of research done internationally about the subject. Most commonly identified challenges are: lack of use of the preventative measures, inadequate risk assessment, unsystematic monitoring, communicational problems, resource allocation, work environment, and flaws in the implementation process. Limitations and inconsistencies in nurses' knowledge, attitude and work habits are also challenges. Education of the nurses, controlling the dissemination of guidelines, the attitudes in work place, local protocols and resource management are the factors that organizations can do to improve the implementation. Further research is needed.