

## Original Article

# Nurses' Experiences of Supporting Sleep in Hospitals – A Hermeneutical Study

**Leena Honkavuo, PhD, RDN, RN, CM, RNT**

Department of Caring Science. Division for Social Sciences, University of Abo Akademi, Vasa, Finland

**Correspondence:** Dr. Leena Honkavuo, University of Abo Akademi, PB 311, 65101 Vasa, Finland

**E-mail:** honkavuo@hotmail.com

### Abstract

**Background:** Good sleep is important for health and a subjective sense of well-being. Various internal and external factors affect patients' quality and quantity of sleep. To sleep in hospitals involves a new situation and may cause changes in patients' sleep patterns.

**Aim:** To describe nurses' experiences and perspectives on sleep and sleeping in hospitals and ask how nurses can support patients' sleep to contribute the achievement of enhanced patient health outcomes.

**Methods:** The design is qualitative, descriptive and explorative and of a hermeneutic and inductive nature. The data collection is based on a sample of semi-structured interviews with twenty nurses from Finland, who narrated their experiences of sleep and sleeping in hospitals.

**Results:** Nurses experience that patients have varying understandings of sleep in hospitals. Suffering can arise from inadequate sleep. Respect for patients' sleep and a drive to implement a health-promoting sleeping environment in hospitals is a multi-dimensional challenge for nurses.

**Conclusion:** Patients can conquer the source of healthy sleep by using the nurse's support to master their illness and in this way attain a better quality of life. Evidence-based nursing and caring science sleep research that emphasizes the patient's experience perspective on sleep in hospitals is needed to increase nurses' knowledge. It is important that sleep research can be detached from the strong grasp of medical science in view of a holistic patient care.

**Keywords:** sleep, hospital, nurses, experiences, nursing, caring science, hermeneutics

### Introduction

Sleep affects health, welfare and quality of life because it can promote healing and recovery from diseases. The absence of health is interwoven with reduced activity levels and increased need for sleep and rest (Akerstedt & Nilsson, 2003). Nightingale pointed out in the 1860's that enough sleep heals and promotes patients' health during their hospital stay. She argued that loneliness, anxiety, uncertainty, anticipation and surprising information gave rise to illness in patients (Nightingale, 1992). It can be concluded 160 years later that little has changed. Nurses need more knowledge about patients' sleep in hospitals. This knowledge should be based on nursing and caring science and research about the impact of sleep on human health in order to describe opportunities to

support adequate sleep experiences for patients in hospitals. Health is an ideal state and its support includes respect for dignity (Eriksson, 2000). Nurses' support to patients is linked to a caring idea, which entails the alleviation of suffering, and the preservation and protection of life and health. This idea is related to a deep meaning and understanding of both health and sickness, and which motivate caring and healing (Antonovsky, 2005; Eriksson, 2015; Henderson, 1966). Once a patient enters a hospital the treatment of the disease or diagnosis will be first priority. The healing and nurturing effects of good sleep are often noted secondarily. This means that patients may experience caring as deficient which in turn may cause unnecessary suffering.

Sleep research has been carried out since ancient Greece, but the question of why human beings

need sleep has not yet been fully elucidated (Hellstrom et al., 2011; Lei et al., 2009). This present study highlights nurses' experiences and perspectives on sleep and sleeping in hospitals and asks how nurses can support patients' sleep to contribute the achievement of enhanced patient health outcomes.

### Previous research

Sleep studies conducted at long-term institutions, nursing homes, surgical wards and intensive care units show that patients' sleep is constantly interrupted during a hospital stay (Humphries, 2008; Ramsay et al., 2005; Tramner et al., 2003).

Patients experience that short-term sleep periods and reduced quality of sleep are unsatisfactory. The subjective experiences of sleep in hospitals partly derived from the individuals themselves, and partly from external elements, over which the patients had no influence (Ohayon et al., 2004; Snowden, 2008; Wang et al. 2010). The individual elements were connected with the patients' age and gender, emotions and pain, separation from their next-of-kin, and thoughts related to an uncertain future because of the illness or disease (Isaia et al., 2010; McMillan et al., 2008). Other influencing factors were the hospital's activities which resulted in widespread disquiet at wards night-time (Buysse et al. 2005; Chen et al., 2009). Medical-technical equipments, medication administration or routine observations interrupted sleep (Frighetto et al. 2004). Telephones, creaky doors and the nurses' communication with their colleagues, or the patients' fellow patients contributed to poor sleep quality. Sharing patient rooms with fellow patients that coughed, snored, cried, talked or screaming children as well as frequent visits to the toilet in an unknown hospital setting influenced harmfully on sleep quality and quantity (Chen et al., 2009; Hedges & Albano, 2007; Lei et al. 2009). Problems in falling asleep, involuntary awakenings and disturbed sleep phases contributed to a need to sleep in the daytime (Griffiths & Peerson, 2004; Snowden, 2008). To compensate for an interrupted night's sleep during the day may be warranted as these promote recovery from the illness and treatment and prepare patients for the next awake period (Hellstrom et al., 2011; Vallido et al., 2009).

Nurses may in different approaches allow for a better quality of sleep for patients and in that way, contribute to enhanced patient health (Pellatt, 2007). The importance of a good sleep

hygiene performed by basic nursing interventions in patient rooms arises before the patient lies down to sleep (Vallido et al., 2009). Comfortable room temperature, personal hygiene, pain relief, sleeping drugs and the monitoring of nutritional status are factors that contribute to a better sleep experience in hospitals (LaReau et al., 2008; Hoffman, 2007; Snowden, 2008). Short-term use of sleeping drugs can provide patients with a desired effect and positive experience of good sleep, but the use of these drugs over a longer period reduces the positive effect (Dogan et al. 2005; Frighetto et al., 2004).

The reduction in patient care related interventions and other hospital activities at night are necessary measures (Hedges & Albano., 2007; Monsén & Edéll-Gustavsson, 2005). Patients' need for sleep often changes during the hospital stay as a result of diagnosis, treatment and medication. Information, meaningful conversations and dialogues with both the patient and their next-of-kin can contribute to a deeper understanding of the patient's situation and his or her subjective experience of sleep quality in hospitals (Skard Heier & Wolland, 2005; Vallido, 2009). Different sleep-promoting practical nursing interventions such as reducing noise levels, night light and the offering of earplugs were emphasized in sleep studies (Li et al., 2011; Hellstrom et al., 2011; Richardson et al. 2007).

Previous studies show that the fundamental importance and healing function of sleep is complex and difficult to define. The studies reveal the need for caring science based sleep research that highlights the patient's perspective and contributes to the healing effects of sleep. The research field on sleep and rest seems to be dominated by the perspective of medical science. Patients' ability to sleep in hospitals was first discussed in the 1950s but it took several decades before clinical nursing research focused more in depth on the theme (Hellstrom et al., 2011; Skard Heier & Wolland, 2005).

### Aim of the study

This study aims to describe nurses' experience of sleep and how nurses can support sleep during the patients' stay in hospitals. The study seeks to answer the following research questions: What are nurses' experience of patients sleep and sleeping in hospitals? And how can nurses support sleep in hospitals to provide enhanced patient health?

### Methodological approach

The gadamerian hermeneutics of understanding reflect a philosophy that guides the interpretation procedure, in addition to being affected researchers' valuebases, pre-understandings and prejudices (Gadamer, 2013). In interpretive hermenautical research, researchers interpret the participants' experiences. They are at the same time aware of that understanding the participants' lived experiences always has a subjective nature.

The starting point for the interpretation in this study is the researcher's pre-understanding and background. Kvale & Brinkmann's (2014) qualitative research interview was chosen as a method of collecting material for the study. The intention with the interviews is to get closer to the participants' nuanced descriptions of their specific experiences. The interview questions asked the participants were follow: What kind of experiences do you have with patients' sleep and rest in hospital? How can you support and promote patients' sleep when you have experienced their situation of sleep and rest in hospital? In terms of this study the research interviews are in a way narratives about the specific phenomenon of interest; that of patients' sleep and sleeping in hospitals. To understand and interpret the narratives a hermeneutical approach was used inspired by Gadamer's philosophical thinking. This method involves interpreting the meaning of a text or a narrative in a structural way and it is commonly used by caring science researchers. The dialectical movement in interpretation moves back and forth between empirical material, caring science and Gadamer's hermeneutical philosophy and reveals deeper insight into meaningful content in narratives.

### Participants and setting

A strategic sample of 20 Finnish nurses was recruited from two surgical units at a university hospital in the western part of Finland, of whom fourteen participants responded and were subsequently interviewed and included in the study. Inclusion criteria included the following: 1) at least three years work experience as a registered nurse from a hospital unit 2) three-shift working schedule and 3) personnel interest to be part of this study. Exclusion criteria included the following: 1) not working in three shifts and 2) not working in a leading position. The interviews were initiated by collecting demographic data. The participants' consisted of eleven females and

three males, aged between 31 to 43 years. They all were educated as nurse specialists. The participants' work experience as legitimated nurses varied from 6 to 17 years.

The participants responded to semi-structured interview questions and described their lived experiences and understanding of sleep and sleeping in hospitals. Participants were interviewed once. For the aim of this study the narratives were recorded, transcribed and de-identified, thereby creating texts that were possible to be interpreted. The hermeneutical interpretation was a circular event and had its origin in the study's research questions. The researchers' mission was to gain an understanding of the lived experiences articulated by the participants' narratives. By using hermeneutical interpretative approach, it was possible to describe a dialectical process in order to attain understanding.

The transcribed texts constituted the data for the hermeneutic interpretation. The first interpretation stage started by focusing on the whole and then defining the research phenomenon, followed by the thematic inductive analysis. In the next stage of the interpretation procedure, the text was divided into hermeneutical meaning units. These theme units perform meaningful narrative texts from different participants. Based on these two stages the researcher continued to search a deeper understanding and concluded that the research phenomena were inductively explained by the thematic questions of the study. In the concluding stage the text was explored as a whole and the understanding and the theme units were explained in relation to the text. The content of the text material was re-read and analysed in-depth once numerous times. It was then possible to construct an understanding of the whole and identify meaningful thematic units that were found across the narratives. These meaningful thematic units describe nurses' experience of sleep and sleeping in hospitals. This hermeneutical procedure opened up for a new or a different kind of understanding and interpretation of the text. It also supported to validate the findings. This process ensured that the interpretations were warranted and the findings dependable, thereby enhancing the rigour of the study. During the final part of the hermeneutical interpretation the existing research literature was brought to bear on the

interpretations to extend, challenge or refine them.

**Research ethics**

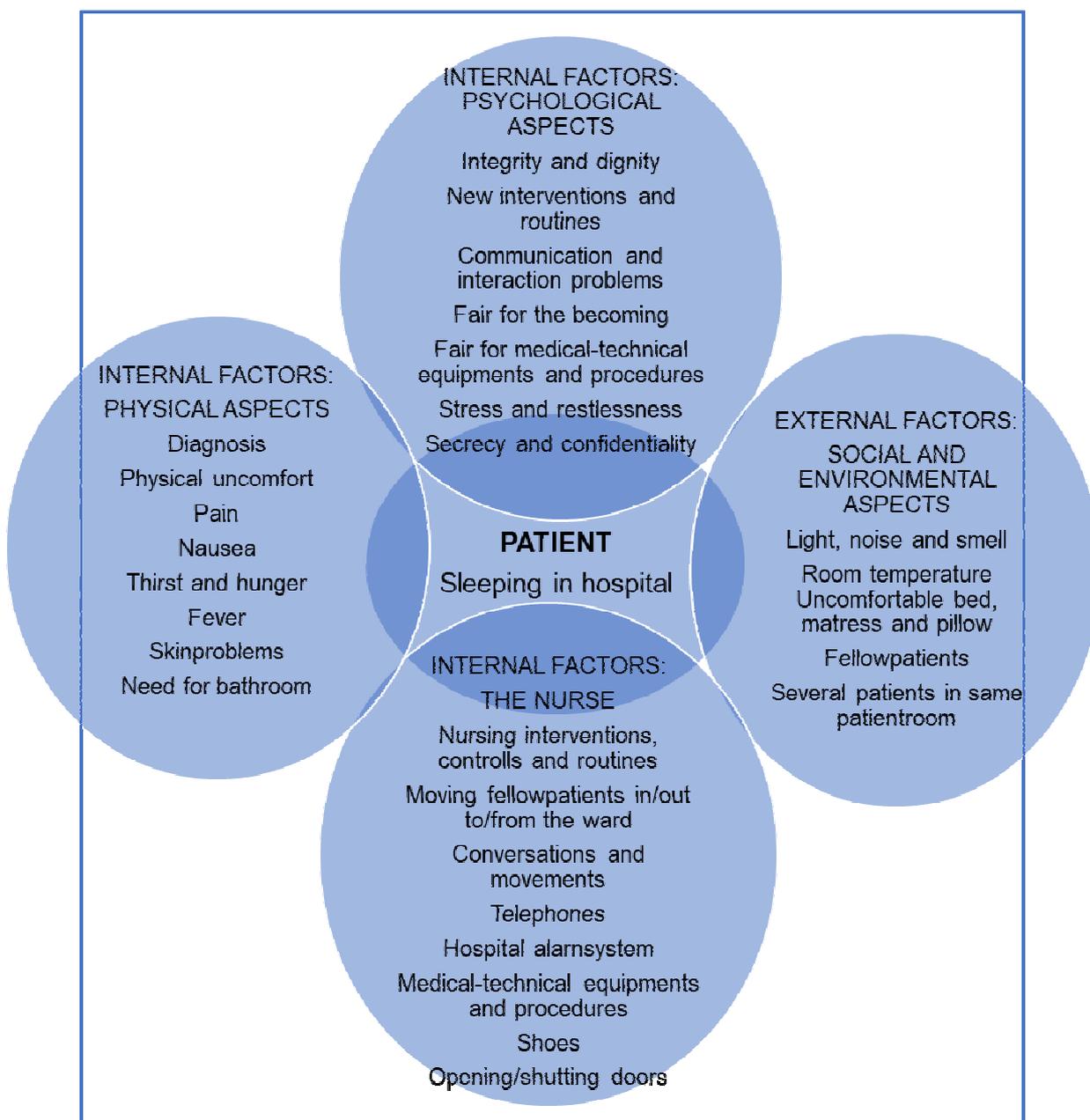
General ethical aspects and rules by have been followed throughout the study. Ethical aspects of professional secrecy and respect for the participants’ anonymity have been observed

when collecting and processing the data (WMA, 2017; ICN, 2006; NNF, 2014).

**Findings**

The participants described their lived experiences of patients’ sleep in hospitals in many common ways and words. These are portrayed in three major thematic units: supporting the sleep, nursing communion and suffering and sleep

Figure 1: Patient sleeping in hospital



### **Supporting the sleep**

It is obvious that nurses' support protects and enables the patients' sleep and rest. Naps and rest also during the day aid in recovery from illness or treatment and can thereby contribute to an enhanced health.

*It's good that the department is closed for visitors during the day. The patients need their sleep. Nursing interventions are needed around the clock so I can imagine how stressful it may be for patients and their fellow patients when somebody is always there beside them (female, 28 years).*

Nurses' respectful care for patients confirms their patients' confidence and allows for the experience of self-esteem. This can be related to the experience of well-being, preserve integrity and balance for the nurses' own situation.

*I have been a patient myself. The situation taught me a lot. It is important that we are friendly and helpful to all kinds of patients, even if we have many other things to do. We need to talk about and take patients sleep seriously and make respect our primary focus (female, 33 years).*

The hospitals' sleep environment is a larger issue and it does not promote sleep quality. Thus, it is justified for nurses to seek alternative strategies to support patients. Further, it is important that patients can have confidence in nurses and that nursing interventions are related to the advancement of the sleep environment.

*I started to give the patients earplugs. Unfortunately, we don't have economical frames to distribute eye masks for every patient so I give them an extra small towel they can keep over eyes. I hope these interventions can give them more undisrupted sleep. Of course... there are sleeping pills to deal out but many patients, especially the younger ones are quite sceptical to those (female, 41 years).*

### **Nursing communion**

The basic nature of nursing is seen as an expression of mutuality and an interactive communion between nurse, patient and the patients' next-of-kin. The interviews emphasize that nursing communions are based both on good treatment and a relationship between a nurse and a patient. The nurses' support, caring and will to

read patients' situations is of great importance for how patients experience sleep in hospitals.

*I think professional nurses can read their patients' situation and their needs. The patient is at the centre and gives meaning to all kinds of medical and nursing interventions. Patients must feel that we welcome them and that we will take care and support them in the best possible way (female, 40 years).*

### **Suffering and sleep**

The patients meet a new and often a different kind of situation during their hospital stay, which can be experienced as stressful because it usually involves a change or a turning point from the habitual. Fear and anxiety for the becoming, the unknown future, the disrupted basic health rhythm and the uncertain knowledge about how long the hospital stay will last, influence the patients sleep. It is known that a hospital stay may open up for an existential life journey. The patient's inner world initiates existential questions that give the foundation for the circumstances to the becoming related with the current situation.

*When patients get their diagnosis, they may get very scared and start to worry about how things will go. This affects their sleep, of course. They may feel that they don't sleep at all. Their recovery is sometimes a miracle when we know that their thoughts keep going round and round their minds 24/7 (female, 38 years).*

Admission to a hospital is based mostly on involuntary conditions. It is natural that patients are then forced to sacrifice something of themselves to achieve health, while a stay in a hospital is a necessity. This kind of sacrifice can be compatible with various dimensions of health and suffering. Patients are often prepared for that suffering from an illness or disease may cause a poor and reduced sleep quality because possible pain can dominate their consciousness.

*Sometimes the patients get disappointed and stressed that they are taken to the observation unit. Most of them understand that this may be the best way to release their pain and in that way give them a little rest and sleep (male, 37 years).*

One of the important views the narratives revealed was that nurses can confirm the *human*

*being in the patient* by responding with professionalism, respect, dignity and esteem. These aspects include a sensitive balance between closeness and distance and realized through the nurses' discretion and empathetic attitude for the patient's private sphere.

## Discussion

This study describes nurses' experiences of sleep and aims to answer the question how nurses can support patients' sleep during their stay in hospitals. The primary implication derived from the results is that nurses' experience that the patients' subjective understanding of sleep quality and quantity is often unsatisfactory during their hospital stay. This is something nurses should always keep in mind.

The overall goal for healthcare is to alleviate suffering caused by different factors. Hospitals strive for natural diurnal variations in spite of activity around the clock and especially the nights may initiate suffering. Poor sleep can be experienced as suffering, and can be understood as a struggle between good and evil for some patients (Eriksson, 2015). Insomnia may lead to a reflection on existential issues in life. A hospital stay can open up and extend a patient's perception and understanding of health and suffering, life and death. Nurses' important task is to create conditions for holistic patient care that take into account the whole individual, alleviate suffering and contribute to enhanced sleep and health. However, it is not always possible to meet patients' individual needs and their personal sleeping habits. Illness, disease, injury or surgical operations may cause feelings of a diminishing quality of life at different times, especially during a hospital stay. To be an in-patient means sacrificing the self and following hospital routines, timetables and clinical practice. The relief of suffering requires confidence, trust and caring.

Sleep disorders can lead to serious consequences for the immune system because the healing processes of sleep are linked to the promotion of health. The treatment of this unsatisfactory state is both conservative and medical (Snowden, 2008; Ohayon et al., 2004). The conservative way of thinking includes various forms of clinical nursing practices related to alleviating support that can soothe brain activity and lead to a healing sleep. Medical treatment consists mainly of pain and sleeping drugs. The patients need support and practical guidance to be able to sleep

in hospitals (Hendersson, 1966; Nightingale, 1992). However, it may be necessary that nurses can explain that interrupted sleep is sometimes a normal phenomenon in life, belonging to all age groups, but in a hospital, this is more prevalent. If the hospital stay lasts over a longer period and the patient's sleep patterns and sleep quality are continuously interrupted or changed, it is essential that the nurses are aware that this may lead to hormonal changes.

This present study's validity is assessed by and based on the material responding to the research questions. The study of different interpretative parts and whole is described and an internal logic has been attempted. The study reveals the meaning and experiences of the qualitative substance, hermeneutical understanding and interpretation. This means that it represents the nurses' currently available experiences and knowledge regarding sleep in hospitals. The study was limited to a moderately sample of participants, which is characteristic of qualitative methods. The purpose of using Gadamer's hermeneutical thinking was to interpret experiences based on an in-depth exploration of each participant rather than to generalize across a large number of participants. The interviews were conducted by the author at the strategically selected hospital. This means that all interview situations were similar kind. In a qualitative study such as this, validity and credibility lies in the quality of each interview rather than the number of samples. It is obvious that hermeneutical interpretation never gives one single truth that is universal. There are many ways to interpret a study, and results the study shows may represent one of several possibilities. According to Gadamer (2013), all possible interpretations are not equally probable. The author has ended up with such a truthfull interpretation of the narratives as possible. However, it is possible that other authors might have found other kind of implications or perspective, if they had been a part of the interpretation process or, if the methodological approach would had been something else. It could also have been motivated to interview and investigate patients' to elucidate the perspective of their sleep when hospitalized. However, this perspective could have changed the focus from caring science sleep research and the individual nurses' lived experiences of patients' sleep and sleeping in hospitals and given the study other characteristics.

It is clear that there is a need for caring science research to increase knowledge as regards the subject of sleep. The theoretical knowledge related to clinical practice is aimed at nurses to implement various sleep-promoting measures during a patient's hospital stay. Health care programs invite nurse students to learn about the latest sleep research, on the impact on health and wellness of sleep and how prospective nurses can support hospital patients' sleep. The narratives provide implications for a critical research review, future caring science sleep research and deeper analytical discussions of sleep in hospitals.

### Conclusion

Nurses' important task is to consider various health aspects, support and pave the way for patients' restful and safe sleep in hospitals. This task includes a mission to enable patients to achieve optimal health. Sleep increases welfare and prevents illnesses and diseases. Sleeping stages and what happens during sleep as well as sleep patterns is a topic that commonly is ameliorated with pharmaceutical treatments rather than a thoughtful consideration of the patients' environment in hospital. Hospital stays can affect patients' sleep quality and quantity. Personal reasons, thoughts about the diagnosis and hospital activities can change sleep patterns and cause suffering. It is then possible that health promotion will be delayed. It is important that nurses respect and are open to discussions with patients and their next-of-kin to help the patients' situation with a healing purpose. Health consists of various dimensions and has different meanings for different individuals. Nurses' experiences of rest, sleep and sleeping in hospitals need more investigation.

### Acknowledgement

Special thanks to Professor Lisbet Nystrom at Abo Akademi University in Finland for valuable comments when carrying out this manuscript.

### References

Antonovsky A. (2005). The mystery of health. Nature and Culture, Stockholm (in Swedish).  
 Buysse DJ., Monk TH., Carrier J. & Begley A. (2005). Circadian patterns of sleep, sleepiness and performance in older and younger adults. *Sleep*, 28 (11): 1365-1376.  
 Chen HM., Clark AP., Tsai LM. & Chao YF. (2009). Self-reported sleep disturbance of patients with heart failure in Taiwan. *Nursing Research*, 58 (1): 63-71.

Dogan O., Ertekin S. & Dogan S. (2005). Sleep quality in hospitalized patients. *Journal of Clinical Nursing*, 14 (1): 107-113.  
 Eriksson K. (2000). Health Idea. Liber AB, Goteborg. (in Swedish)  
 Eriksson K. (2015). The suffering man. Sahara Printing Company, Egypten.(in Swedish)  
 Frighetto L., Marra C., Bandali S., Wilbur K., Naumann T & Jewesson P. (2004). An assessment of quality of sleep and the use of drugs with sedating properties in hospitalized adult patients. *Health and Quality of Life Outcomes*, 2: 17.  
 Gadamer H-G. (2013). *Truth and Method*. Bloomsbury Academic, London.  
 Griffiths MF. & Peerson A. (2004). Risk factors for chronic insomnia following hospitalization. *JONA*, 49 (3): 245-253.  
 Hedges C. & Albano J. (2007). Sleep quality and noise disturbances in a cardiac/trauma step-down unit. *American Journal of Critical Care*, 16 (3): 304-305.  
 Hellstrom A., Fagerstrom C., & Willman A. (2011). Promoting sleep by nursing interventions in health care settings: A systematic review. *Worldwide on Evidence-Based Nursing*, 8 (3): 128-142.  
 Henderson V. (1966). *The nature of nursing*. Macmillan, New York.  
 Hoffman AJ., Given BA., von Eye A., Gift AG. & Given CW. (2007). Relationships among pain, fatigue, insomnia, and gender in persons with lung cancer. *Oncological Nursing Forum*, 34 (4): 785-792.  
 Humphries JD. (2008). Sleep Disruption in Hospitalized Adults. *Medsurg Nursing*, 17 (6): 391-395.  
 International Council of Nurses ICN. (2005). *The ICN Code of Ethics for Nurses*. Geneva (Switzerland). Referred 10.01.2018: <http://www.icn.no/icncode.pdf>.  
 Isaia G., Corsinovi L., Bo M., Santos-Pereira P., Michelis G., Aimonino N. & Zanolchi M. (2010). "Insomnia among hospitalized elderly patients: Prevalence, clinical characteristics and risk factors". *Archives of Gerontology and Geriatrics*, 52 (2): 133-137.  
 Kvale S. & Brinkmann S. (2014). The qualitative research interview. Studentlitteratur AB, Lund. (in Swedish)  
 LaReau R., Benson L. & Watcharotone K. (2008). Examining the feasibility of implementing specific nursing interventions to promote sleep in hospitalized elderly patients. *Geriatric Nursing*, 29 (3): 197-206.  
 Lei Z., Qiongjing Y., Qiuli W., Sabrina K., Xiaojing L. & Changli W. (2009). Sleep quality and sleep disturbing factors of inpatients in a Chinese general hospital. *Journal of Clinical Nursing*, 18 (17): 2521-2529.  
 Li S-Y., Wang T-Y., Wu SFV., Liang S-Y. & Tung H-H. (2011). Efficacy of controlling night-time noise

- and activities to improve patients' sleep quality in a surgical intensive care unit. *Journal of Clinical Nursing*, 20, 396-407.
- McMillan S, Tofthagen C. & Morgan MA. (2008). Relationships among pain, sleep disturbances, and depressive symptoms in outpatients from a comprehensive cancer center. *Oncology Nursing Forum*, 35 (4): 603-611.
- Monsén MG. & Edéll-Gustavsson UM. (2005) Noise and sleep disturbance factors before and after implementation of behavioural modification programme. *Intensive and Critical Care Nursing*, 21 (4): 208-219.
- Nightingale F. (1992). *Notes on Nursing. What it is and what it is not*. Lippincott, Philadelphia.
- Northern Nurses' Federation NNF. (2014). *Ethical guidelines for nursing research in the Nordic countries*. Oslo. Referred 10.01.2018: <http://www.ssn-nnf.org>.
- Ohayon MM., Carskadon MA., Guilleminault C. & Vitiello MV. (2004). Meta Analysis of Quantitative Sleep Parameters From Childhood to Old Age in Healthy Individuals: Developing Normative Sleep Values Across the Human Lifespan. *Sleep*, 27 (7): 1255-1273.
- Pellatt GC. (2007(b)). The nurse's role in promoting a good night's sleep for patients. *British Journal of Nursing*, 16 (10): 602-605.
- Polit D. & Beck C. (2013). *Nursing research: principles and methods*. 8<sup>th</sup> ed. Lippincott, Williams & Wilkins.
- Ramsey A., Scott H., Kennaugh J. & Doherty H. (2005). Wake-up call. *Occupational Health*, 57 (12): 20-22.
- Richardson A., Allsop M., Coghill E. & Turnock C. (2007). Earplugs and eye masks: do they improve critical care patients' sleep? *Nursing in Critical Care*, 12 (6): 278-286.
- Skard Heier M. & Wolland AM. (2005). Sleep and sleep disturbances. Cappelen Akademisk Forlag: Oslo. (in Norwegian)
- Snowden A. (2008). Insomnia: management and treatments. *Nurse Prescribing*, 6 (9): 382-388.
- Tramner JE., Minard J., Lee AF. & Rebelo L. (2003). The Sleep Experience of Medical and Surgical Patients. *Clinical Nursing Research*, 12 (2): 159-173.
- Vallido T., Peters K., O'Brien L. & Jackson D. (2009). Sleep in adolescence: a review of issues for nursing practice. *Journal of Clinical Nursing*, 18 (13): 1819-1826.
- Wang T-J., Lee S-C., Tsay S-L. & Tung H-H. (2010). Factors influencing heart failure patients' sleep quality. *Journal of Advanced Nursing*, 66 (8): 1730-1740.
- WMA 2017. *World Medical Association Declaration of Helsinki. Ethical Principles for Medical Research Involving Human Subjects*.
- Akerstedt T. & Nilsson PM. (2003). Sleep as an restitution: an introduction. *Journal of Internal Medicine*, 254 (1): 6-12.