An Evidence-based Guideline on Using Acupressure to Improve Quality of Sleep for Hemodialysis Patients

By

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BN; RN

A dissertation submitted in partial fulfillment of the requirement for the Degree of Master of Nursing at The University of Hong Kong

July 2015
Declaration

I declare that this dissertation represents my own work, except where due an acknowledgement is made, and that it has not been previously included in a thesis, dissertation or report submitted to this University or to any other institution for a degree, diploma or other qualifications.

Signed ______________________________________

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July 2015
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Globally, the number of patients with end-stage renal failure and undergoing hemodialysis is increasing. Patients who have chronic dialysis will suffer from different physical and emotional symptoms. One of them is having sleep disorders which is common among hemodialysis patients. Many hemodialysis patients report poor sleep quality which can be assessed by the Pittsburgh Sleep Quality Index (PSQI). The health, daily activities and quality of life of hemodialysis patients will be affected by the poor sleep quality. Pharmacological treatment is often prescribed for the management of their sleep problem.

Various randomized controlled trial (RCT) studies show that the use of acupressure, a non-pharmacological and non-invasive method, can improve the sleep quality of hemodialysis patients. Yet, there is no evidence-based guideline established on improving sleep quality by
using acupressure for hemodialysis patients and the aim of this dissertation is to develop an evidence-based guideline.

To develop a guideline for using acupressure to improve the quality of sleep among hemodialysis patients, a systematic review of related literature was performed. Four relevant RCT studies were found and data were extracted from them to generate a table of evidence. Moreover, the quality of the studies was assessed using a quality appraisal tool, the Scottish Intercollegiate Guideline Network (SIGN). After that, an evidence-based guideline on using acupressure to improve quality of sleep for hemodialysis patients was established and the implementation potential was found to be high through evaluating its feasibility, transferability and cost-benefit ratio.

Throughout the implementation, a communication plan was developed for recognizing the stakeholders of the evidence-based guideline first, and to initiate, guide, and sustain the change. Then a pilot test plan was made in order to determine the feasibility of implementing the evidence-base guideline. The pilot test lasted for 4 weeks and targeted 60 hemodialysis patients. An evaluation plan was also conducted to assess the evidence-based guideline in regard to accomplishing the outcomes in hemodialysis patients, renal nurses and the system.

The proposed evidence-based guideline on using acupressure to improve quality of sleep for hemodialysis patients is recommended to be worthy of adoption in the renal ward of local hospital.
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Department Operation Manager of the Target Hospital

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Renal Nurses of the Ward

Ward Manager of the Renal Ward

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4.2 Pilot Test Plan

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Chapter 1

Introduction

Sleep disorders, which are categorized by disturbances of usual sleep behaviour or patterns (Thorpy, 1994), are a common problem among hemodialysis patients. Sleep disturbance may cause a negative influence on their health and quality of life. One of the duties of nurses is managing the symptoms of patients and promoting their comfort. Nevertheless, current treatments to manage sleep problems such as sleeping medicine may cause side-effects. Studies have reported the effectiveness of using a non-invasive and non-pharmacological method, acupressure, to improve the sleep quality of hemodialysis patients. Throughout this chapter, the background, affirming needs, objective and significance will be discussed.

1.1 Background

In 2010, the two countries with the highest prevalence rates of end-stage renal disease (ESRD) were both in Asia. They were Taiwan and Japan at 2,584 and 2,260 per million population respectively (United States Renal Data System, 2012). Globally, the number of patients who have ESRD with renal replacement therapy (RRT) is increasing. Hemodialysis is one of the RRTs and it is the most common dialysis therapy (Murtagh, Addington-Hall & Higginson, 2007; United States Renal Data System, 2012).

In Hong Kong, the trend of patients with RRT increasing, the incidence rate of patients with RRT was 95.1 and 157 per million population in 1996 and 2011 respectively (Ho, et al., 2013). The number of patients with ESRD on peritoneal dialysis is more than those on hemodialysis in Hong Kong; however, since 2010 the prevalence rate of patients on hemodialysis in public sections increased significantly (Ho, et al., 2013).
Sleep disorders are common among hemodialysis patients. The studies of Tsay and Chen (2003) and Walker, Fine and Kryger (1995) reported that about 50% to 80% of them had sleep disorders. The most common sleep disorder for those undergoing long-term hemodialysis is insomnia (Cengic, Resic, Spasovski, Avdic & Alajbegovic, 2012; Haba-Rubio, de Seigneux & Heinzer, 2012). The other frequent sleep disorders of patients on dialysis include excessive daytime sleepiness, sleep apnea, periodic limb movement in sleep and restless legs syndrome (Bastos, et al., 2007; Kosmadakis & Medcalf, 2008; Winkelman, Chertow & Lazarus, 1996).

Instead of sleep disturbance, the other common physical and emotional symptoms that patients on chronic dialysis experience are fatigue, anorexia, pain, pruritus, constipation, nausea, restless legs, anxiety and depression (Kimmel, 2002; Merkus, Jager, Dekker, de Haan, Boeschoten & Krediet, 1999; Murtagh, Addington-Hall & Higginson, 2007; Weisbord, et al., 2004).

The Pittsburgh Sleep Quality Index (PSQI) is used commonly to measure the quality of sleep, and a global PSQI score of over 5 indicates that a person has poor sleep quality (Buysse, Reynolds, Monk, Berman & Kupfer, 1989). Iliescu and colleagues (2003) and Bastos and colleagues (2007) found that around 75% of patients on hemodialysis had poor sleep quality. Poor sleep quality may affect hemodialysis patients’ daily activities and their social behaviour, and as a result their performance and quality of life will be reduced. Not only quality of life, numerous studies show that poor sleep quality will also lead patients to have more severe diseases and higher mortality (Elder, et al., 2008; Iliescu, et al., 2003; Sanner, et al., 2002; Inonu & Kokturk, 2010).
The sleeping medications and bronchodilators are usually prescribed to hemodialysis patients to improve their sleep quality (Nasiri, Raei, Vatani & Khajeh-Kazemi, 2011). However, considering the side-effects and helpfulness of pharmacological management, it may be beneficial to promote a new approach of complimentary treatment of acupressure to improve sleep quality among hemodialysis patients.

Measurement of sleep quality
The Pittsburgh Sleep Quality Index and sleep log are the measurements usually used clinically to measure sleep quality.

The Pittsburgh Sleep Quality Index (PSQI)
Since the development of the Pittsburgh Sleep Quality Index (PSQI) by Professor Buysse in 1989, PSQI has become a useful instrument to assess subjective sleep quality and sleep disturbance with prevalent acceptance. It was originally suggested to be used for clinical practice and research activities in psychiatry and general medical settings.

The PSQI is a self-rating questionnaire measuring a widespread variety of indicators of sleep quality with regard to the past one month before testing (Appendix I). It consists of 19 self-rated questions which are used to generate seven components including subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, daytime functional status and use of sleeping medications. The score of each component is rated from 0 to 3. The sum of the seven components becomes the global PSQI score, ranging from 0 to 21. The higher the global
score, the poorer the sleep quality. A global PSQI score of over 5 is a measure to distinguish good and poor sleepers with a diagnostic sensitivity of 90% and specificity of 87% (Buysse, Reynolds, Monk, Berman and Kupfer, 1989).

Moreover, the PSQI does not only contain 19 questions but also five questions are rated by the bed partner or roommate. These five questions are used for clinical data as a reference only and are not counted in the global PSQI score (Buysse, Reynolds, Monk, Berman and Kupfer, 1989).

**Sleep log**

Sleep log, also called sleep diary, is a simple and inexpensive method that is used to monitor sleep day-by-day. It is commonly used clinically and in research settings. Patients will record their time awake at night and frequency of nocturnal awakenings. The subjective sleep quality will be rated from 0 to 10. The highest score indicates that the patient sleeps well (Rogers, Caruso & Aldrich, 1993; Tsay & Chen, 2003). Sleep log can provide reliable data about sleep and awake patterns with a sensitivity of 92.3% and specificity of 95.6% (Rogers, Caruso & Aldrich, 1993).
1.2 Affirming Needs

The number of patients with end-stage renal disease (ESRD) is increasing worldwide and in Hong Kong. The prevalence of patients on hemodialysis has increased. Since sleep disorders are a common problem for patients on hemodialysis, as a nurse it is essential to help them to improve their quality of sleep in order to promote better health and quality of life. The health and quality of life can be assessed by the SF-36 Quality of Life Scale, which was developed by Ware and Sherbourne (1992) and it was stated to be effective in chronic diseases such as ESRD (Karadag, Kilic, Karatay & Metin, 2014).

1.2.1 Local setting

I work in a renal ward of a local acute hospital with adult patients only. There is an area for end-stage renal disease patients to have maintenance hemodialysis two to three times per week. Each time lasts about 4 to 5 hours, depending on the frequency of having hemodialysis every week. There is a morning section and afternoon section provided. In each section a renal nurse needs to take care of about 5 to 6 hemodialysis patients.

Hemodialysis patients in my ward usually complain of fatigue, restless legs and constipation. Moreover, 6 out of 10 hemodialysis patients report that they have sleep problems such as insomnia and excessive daytime sleepiness, which affect their daily activities. The usual method for them to manage their sleep problem is by taking sleep medicine. The pharmacological treatment may no longer be effective for them after a lengthy period of taking the sleep medicine. Besides
pharmacological methods, there is no other complimentary treatment provided to them to manage their sleep problems.

### 1.2.2 Clinical Issue and potential innovation

Recently medicine has commonly been used to manage the sleep problems of patients; however, they may experience adverse effects from and dependency on the medicine (Griffiths & Johnson, 2005). Furthermore, the dosage of sleep medicine for patients on dialysis is usually high, which will increase the risk of dependency, drug resistance, memory problems and addiction (Longo & Johnson, 2000).

Aside from pharmacological management causing adverse effects, other non-pharmacological treatments such as acupressure or acupuncture are a new approach to improve quality of sleep for patients. However, the increase of the occurrence of blood transmitted diseases, for example acquired immunodeficiency syndrome, more people are preferring to have acupressure (Reza, Kian, Pouresmail, Masood, Bagher & Cheraghi, 2010). Furthermore, most ESRD patients have diabetes mellitus (Brancati, Whelton, Randall, Neaton, Stamler & Klag, 1997) so it is better to keep their skin intact; thus acupressure may be more suitable for hemodialysis patients.

Acupressure is a type of stimulation of applying pressure to the specific acupoints on the body with the fingers or hands for therapeutic purposes. This therapy is based upon the Chinese medicine theory of Yin and Yang, the natural balance, and it works by correcting the balance of qi in the
body (Freeman and Lawlis, 2001; Tsay, 2004). Qi travels along the 12 energy pathways at different depths of the body called meridians. Along the meridians, there are 365 to 2,000 acupoints. Applying pressure to these acupoints can relieve imbalance by stimulating the energy flow to promote health and offer comfort (Birch and Felt, 1999; Freeman and Lawlis, 2001; Sandifer, 1997; Sinder, 1992). Stimulating the acupoints may also elevate the release of serotonin so the body will become relaxed and then sleep will be promoted (Tsay & Chen, 2003).

Different studies show that acupressure is effective in improving symptoms including fatigue (Tsay, 2004), depression (Cho & Tsay, 2004) and thirst (Yang, Yates, Chin & Kao, 2010) for end-stage renal disease patients. Additionally, many studies indicate that acupressure not only improves the sleep quality of patients on hemodialysis, but also promotes sleep quality for institutionalized residents (Chen, Lin, Wu & Lin, 1999), HIV patients (Phillips & Skolton, 2001) and older adults (Gooneratne, 2008).

Furthermore, the treatment of hemodialysis for end-stage renal failure patients can increase their life expectancy but it cannot change the progress of their chronic disease. They may often feel helpless with loss of control to deal with their disease (Nasiri, Raei, Vatani & Khajeh-Kazemi, 2011; Tsay, 2004). However, using the therapy of acupressure can help patients to reclaim a sense of control over their health and lives (Fryback and Reinert, 1997). Acupressure can be performed by a health care provider, relatives of patients or patients themselves without experts (Chen, Lin, Wu & Lin, 1999; Tsay & Chen, 2003).
Acupressure can relieve different symptoms for ESRD patients, improve quality of sleep for different patients and acupressure does not have side-effects (Tsay & Chen, 2003) compared with the use of sleep medicine. It may be a potential innovation to introduce to hemodialysis patients to improve their sleep quality.

1.3 Research question

The research question is “Can acupressure improve quality of sleep for hemodialysis patients?”

1.3.1 Objectives

The objectives of this paper are:

- To perform a recent literature review on using acupressure to improve the sleep quality of hemodialysis patients
- To review the effectiveness of using acupressure to improve sleep quality among hemodialysis patients
- To develop an evidence-based guideline of using acupressure to improve the sleep quality among hemodialysis patients.
- To assess the probability of implementing the proposed guideline in local settings.
- To perform a quality assessment of the implementation potential of the identified intervention from the literature.
1.3.2 Significance

Increasing numbers of patients are undergoing hemodialysis, many of whom complain of different symptoms. The most common one is poor sleep quality. Poor sleep quality may cause negative effect to their health, daily activities, quality of life and a higher mortality rate. Recently, pharmacological treatment is the usual choice to manage sleep problems, but it causes different adverse effects.

Acupressure is a safe method without side-effects and it can give chronic patients a sense of control of their disease, as it can be performed by themselves. This non-pharmacological and non-invasive method, acupressure, may be effective in improving the sleep quality of hemodialysis patients. Having improved sleep quality with a lower PSQI score and lesser sleep disorder, enables them to have normal daily activities and social performance is not affected. Their quality of life can be improved and mortality rate can be decreased.

In general, an effective evidence-based guideline on using acupressure for hemodialysis patients could improve their quality of sleep.
Chapter 2
Critical Appraisal

In the previous chapter, the background was stated; the affirming needs and significance of an evidence-based guideline on using acupressure to improve the quality of sleep of hemodialysis patients were discussed. A systematic review of the related literature will be described throughout this chapter.

2.1 Searching and Appraisal Strategies

2.1.1 Searching Strategies

Search Methodology
During the period of 1st May, 2014 to 20th June, 2014, a systematic search was conducted through the electronic database from the Yu Chun Keung Medical Library of the University of Hong Kong. The available published studies were searched from the electronic database of PubMed and Cochrane Library. The language was limited to English and all year available were searched from the databases.

Keywords
The keywords and Medical subject heading (MeSH) used for searching were “acupressure”, “Shiatsu”, “Shiatzu”, “Zhi Ya”, “Chih Ya”, “hemodialysis”, “renal dialysis”, “extracorporeal dialysis” and “sleep quality”. The keywords were searched individually and then combined as shown in Appendix II and III.
**Inclusion Criteria**

Studies that were randomized controlled trials (RCT) using acupressure with sham treatment or only a control group to improve the quality of sleep of hemodialysis patients were included. There was no limitation as to gender but the patients had to be 18 or above and undergoing hemodialysis. The treatment should include acupressure and the primary outcome measure should involve the quality of sleep.

**Exclusion Criteria**

Patients under the age of 18 were excluded. Interventions that related to invasive procedures such as acupuncture instead of acupressure were excluded. If the outcome measure of sleep quality was a secondary one or not involved, the study was excluded.

**Searching Result**

The result of using the keywords for searching from the electronic database is presented in Appendix II and III. In conclusion, four out of six from PubMed and one out of 10 were chosen from Cochrane Library. According to the inclusion and exclusion criteria, eight potential studies were searched. After revising the title there were eight potential studies selected. Throughout the screening of the abstracts any repetitions with the other electronic database were then excluded. Five studies were obtained that fulfilled the inclusion criteria. Moreover, the reference lists of the five studies were also screened, but no additional study was found. After revising the full-text of the five articles, two of them were from the same study and one of these two studies was retracted, that is Tsay, Rong and Lin (2003).
Through the keywords searching, instead of RCT there was one pilot study about acupressure improving the sleep quality of hemodialysis patients; however there was no control group (Wu, Zou, Liu, Wu & Lin, 2014). Moreover, there was no other cohort study found. It is possible to have a cohort study on this topic but the chances are slim. As the study would have to follow the cohort groups for some time, it would be difficult to identify whether acupressure is valid or invalid for the outcome. A RCT is more useful. Therefore, finally there were four RCT studies obtained for review.

2.1.2 Appraisal Strategies

After reviewing the four studies, the data about the patient characteristics, details of the intervention and comparison, outcome measurements, and the results of the studies were extracted and listed in a table of evidence, which is shown in Appendix IV. The quality of the studies was assessed using the questions of the checklists from the Scottish Intercollegiate Guidelines Network (SIGN) (Scottish Intercollegiate Guidelines Network, 2014). The results of each SIGN checklist of each study are listed in Appendix V. Throughout the checklist, the quality of the studies was rated by level of evidence of the Scottish Intercollegiate Guidelines Network (SIGN). The rating score was from 1++ to 4 where 1++ was the highest score and is shown in Appendix VI.

Summary of Quality Assessment

The quality of the four studies was assessed using the checklists of the Scottish Intercollegiate Guidelines Network (SIGN), each of which are shown in Appendix V. All the four studies were randomized controlled trials (RCT) and they were all rated 1+ with a low risk of bias (Nasiri, Raei,
Randomization
The four RCT studies clearly stated the focus question in the introduction, which evaluated the effectiveness of acupressure on quality of sleep for hemodialysis patients. All the samples in the four studies were randomly assigned into an intervention or control group, by simple randomization (Shariati, Jahani, Hooshmand & Khalili, 2012), or blinded randomization in which the two trained research assistants who collect the data and the care provider were blinded (Tsay & Chen, 2003). The others did not describe this in detail. All the studies did not mention the concealment method. It might increase the risk of allocation bias and as a result the effect of intervention might be overestimated.

All studies indicated that the intervention and control groups were similar at the beginning. There was no significant difference between the intervention and control group for the baseline information such as demographic factors, mean hemodialysis duration, the mean global PQSI score, current use of medication and the number of chronic diseases. All the studies used standardized acupressure as the intervention for hemodialysis patients.

Blinding Process
For the method of blinding, the subjects cannot be blinded as they will know that they are to have acupressure as an intervention. One study mentioned that the interviewer and care providers were single blinded (Shariati, Jahani, Hooshmand & Khalili, 2012). Two trained research assistants collected all the data and care providers including physicians, nurses, dieticians, and social worker
were single blinded in the study of Tsay and Chen (2003). The studies of Nasiri, Raei, Vatani and Khajeh-Kazemi (2011) and Tsay, Cho & Chen (2004) both did not state the blinding method, indicating that this aspect of the study’s design was ignored.

**Primary Outcomes**

The primary outcomes were reported clearly in all the studies and measured in a standard, valid, and reliable way. The measures of sleep quality in Nasiri, Raei, Vatani and Khajeh-Kazemi (2011) and Tsay and Chen (2003) were measured by using the Pittsburgh sleep quality index (PSQI) and sleep log, while the other two studies were measured by using the PSQI score only (Shariati, Jahani, Hooshmand & Khalili, 2012 & Tsay, Cho & Chen, 2004).

**Missing Data**

Except the study of Nasiri, Raei, Vatani and Khajeh-Kazemi (2011), the other three studies reported that there was dropout with the stated reasons being transplantation, transfer to the intensive care unit, medical reasons and patient relocation. Shariati, Jahani, Hooshmand and Khalili (2012) reported two dropouts for each group. For the study of Tsay, Cho and Chen (2004), there was one dropout for each group. The other reported seven dropouts but did not state the dropout for each group (Tsay and Chen, 2003). For the study of Nasiri, Raei, Vatani and Khajeh-Kazemi (2011), the intention-to-treat principle did not need to be adopted, as there was no dropout; however, the other studies with dropouts also did not. Moreover, the study of Nasiri, Raei, Vatani and Khajeh-Kazemi (2011) was conducted in one hospital which did not need to compare the result with other sites, whereas the other studies were carried out in two to four hospitals, so they also did not compare the result with other hospitals.
Sample Size
The calculation of sample size was reported in the study of Shariati, Jahani, Hooshmand and Khalili (2012) and Tsay, Cho and Chen (2004). The sample size of all studies ranged from 44 to 106. In the study of Tsay, Cho and Chen (2004), the statistical power was stated to be 80% but the other studies did not give this information.

2.2 Summary and synthesis of findings

2.2.1 Summary Data

The data extracted from the four studies are shown in the table of evidence (Appendix IV).

Paper characteristics
The four randomized control trial studies, in which the subjects are randomized into intervention and control groups, were published from 2003 to 2010 in Taiwan (Tsay & Chen, 2003; Tsay, Cho & Chen, 2004) and Iran (Nasiri, Raei, Vatani & Khajeh-Kazemi, 2011; Shariati, Jahani, Hooshmand & Khalili, 2012). Excluding the study of Shariati, Jahani, Hooshmand & Khalili (2012), the other three reported the source of sponsorship or funding.

Patient characteristics
There were a total of 310 adult subjects in all the studies and 135 of them received acupressure during their hemodialysis. The ratio of males to females was 1:5. The mean age of the subjects was 51.17. The mean length of dialysis was 52.55 months (about 4.38 years) and the mean global
PSQI score before intervention was 9.73. There was no significant difference between the intervention and control groups with regard to the characteristics of the subjects.

**Intervention**
The intervention group in all studies received the usual routine care and acupressure massage. The intervention of acupressure massage in all studies was performed 3 days per week for 4 consecutive weeks. The patients in the studies of Nasiri, Raei, Vatani and Khajeh-Kazemi (2011) and Shariati, Jahani, Hooshmand & Khalili (2012) began the intervention 1 hour after the hemodialysis and the latter study stated that this could help patients to have better emotions. In the study of Nasiri, Raei, Vatani & Khajeh-Kazemi (2011), the patients would start by asking for readiness and instruct the patients to sleep on their back and breathe in deeply five times through the nose and expire through the mouth.

The investigators and their assistants were trained by the acupressure massage expert before commencing the study. During the intervention, they would apply consistent pressure at the rate of two rotations per second using the finger tips with the force of 3 to 4 kilogram. Three studies reported that the precision of acupressure could be confirmed by the patients feeling sore, numb, heavy, distended and/or warm (Shariati, Jahani, Hooshmand & Khalili, 2012, Tsay & Chen, 2003; Tsay, Cho & Chen, 2004).

The time of the intervention including time for acupoint massage and relaxation massage ranged from 15 to 20 minutes, depending on the number of acupoints, time for each acupoint and any relaxation massage. The time for each acupoint was 3 minutes in three studies and 5 minutes for the study of Nasiri, Raei, Vatani & Khajeh-Kazemi (2011). The relaxation massage which massages the area around the acupoint, varied from 3 to 6 minutes or none.
The acupoints for each study were not identical. Totally there were eight of them in all studies comprising Shenmen (H7) in the ear, Shenmen (H7), Neiguan (P6) and HeGu (Li4) in the hand, Sanyingjao (SP6), Zusanli (St 36) and Yanglingchuan (Gb34) in both legs and Yungquan or Yungchuan (K1) in both feet. The position of each acupoint is displayed in Appendix VII. The acupoint in the feet in Yungquan and Yungchuan was found in two different research projects but their abbreviation is the same, K1; therefore they represent the same acupoint. Different acupoints applied in different studies are presented in the table in Appendix VIII.

Comparison
All the control groups only received the routine unit care. In the study of Tsay and Chen (2003), there was one more shame group for the comparison. Those patients in the shame group not only received the routine care but also massage at locations with no acupoints, 1 cm away from the meridian, at the same frequency as the intervention group.

Follow up
There was follow up of the patients after the beginning of the intervention in all the studies. The length of follow up for two studies was 5 weeks (Nasiri, Raei, Vatani & Khajeh-Kazemi, 2011; Shariati, Jahani, Hooshmand & Khalili, 2012) and the other two was 4 weeks.

Outcome measures
There were several outcome measures used in the studies. The seven components including subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, daytime functional status and use of sleeping medications that were generated from the Pittsburgh
Sleep Quality Index (PSQI) and the global PSQI which is the sum of the seven components, were all the eight outcome measures. These eight items were the outcome measures of the studies of Nasiri, Raei, Vatani and Khajeh-Kazemi (2011), Shariati, Jahani, Hooshmand and Khalili (2012) and Tsay and Chen (2003), while the other study only assessed the global PSQI (Tsay, Cho & Chen, 2004). Two studies assessed the time awake at night, frequency of nocturnal awakenings and the perception of the quality of sleep (Shariati, Jahani, Hooshmand & Khalili, 2012; Tsay & Chen, 2003). In the study of Tsay, Cho & Chen (2004), the Piper Fatigue Scale (PFS) and Beck Depression Inventory (BDI) were assessed as their study not only determined the effectiveness of acupressure on sleep quality but also on fatigue and depression.

Results
In all studies the effect size of the seven components of the PSQI, the global PSQI, PFS or BDI was recorded with mean, standard deviation or p-value, which is shown and discussed in the form of tables in the result section. The results of the time awake at night, frequency of nocturnal awakenings and the perception of the quality of sleep of two studies (Shariati, Jahani, Hooshmand & Khalili, 2012; Tsay & Chen, 2003) are shown in graph format and discussed in the result part.

2.2.2 Data Synthesis

The provision of acupressure for hemodialysis patients was suggested by all the studies to improve their quality of sleep. In the study of Tsay and Chen (2003), which used a sleep log as one of the measurements of sleep quality, indicated no improvement in the frequency of nocturnal awakenings; however, the time awake at night decreased and the subjective sleep of quality
improved. The improvement of the subjective sleep quality could be seen immediately after the first acupoint massage and it continued to improve throughout the intervention. Furthermore, Nasiri, Raei, Vatani and Khajeh-Kazemi (2011) stated that the enhancement of sleep quality could last till one week after the last acupoint massage.

The mean score of the global PSQI for the intervention groups among all the studies after having acupressure decreased and the result demonstrated significant improvement. In the study of Tsay, Cho and Chen (2004), they only reported the global PSQI score. For the other three, the results of the seven components comprising subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, daytime functional status and use of sleeping medications were recorded. Nevertheless, only the study of Shariati, Jahani, Hooshmand and Khalili (2012) found significant difference in all of these seven components. There were no significant differences in the result of using sleeping medications in both of the studies of Nasiri, Raei, Vatani and Khajeh-Kazemi (2011) and Tsay and Chen (2003). Additionally, the result for sleep latency and sleep disturbances were also not significant in the latter study.

There were different combinations of different acupoints located on the ear, hand, leg and foot for applying massage to hemodialysis patients to improve the quality of sleep among the four studies as shown in Appendix VIII. From the result in the study of Shariati, Jahani, Hooshmand and Khalili (2012), in which there were significant differences in the result of global PSQI and all the seven components of PQSI, so the combination of the acupoints in this study may be more effective than
the others. The acupoints used in this study were Shenmen (H7) and HeGu (Li4) on the hand and Sanyingjao (SP6) on the leg.

There was no standard duration for the intervention, which ranged from 15 to 20 minutes for the four studies. The intervention included two parts, acupoint massage and relaxation massage. For the three studies with both parts, each acupoint was massaged with consistent pressure at two rotations per second for 3 minutes. For the study without relaxation massage, the time of massage for every acupoint was 5 minutes (Nasiri, Raei, Vatani and Khajeh-Kazemi, 2011). In the study of Tsay and Chen (2003), there was significant improvement of PQSI subjective sleep quality for the sham and control group. Though the improvement was greatest in the acupressure group, the massage of acupoints and non-acupoints might produce different levels of relaxation to the body which as a result causes different effects on sleep (Tsay & Chen, 2003). The relaxation massage was essential as one part of the intervention. The duration of relaxation massage of the three studies varied from 3 to 6 minutes.

The study of Tsay, Cho and Chen (2004) not only measured the effectiveness of acupressure on sleep quality for hemodialysis patients but also measured the effectiveness of acupressure in relation to fatigue and depression. The result of the level of fatigue and depression was lowered with significant difference.
2.3 Recommended Interventions

Throughout the systematic review of the four studies, the level of evidence was moderate with a low risk of bias. There was adequate evidence showing that acupressure can improve the quality of sleep for hemodialysis patients. The non-pharmacological and non-invasive method of acupressure is effective to improve the sleep quality of hemodialysis patients. With the improvement of sleep quality, daily activities and social performance will not be affected. Finally, the quality of life of hemodialysis patients will be improved and the mortality rate will be minimized by the acupressure.

Based on the results from the review, the target group for the intervention will be aged 18 or above with ESRD and a global PSQI score of more than 5 under hemodialysis. They should also have a clear mental state without dementia and be able to communicate. They should not have limb amputations or be insulin-dependent diabetics. The intervention will last not more than 20 minutes, including acupoint massage and relaxation massage. Each acupoint is massaged for two rotations per minute for 3 minutes. The recommended acupoints will be Shenmen (H7) and HeGu (Li4) on the hand and Sanyingjao (SP6) on the leg. Acupoint massage can improve sleep quality immediately which continues throughout the intervention. Not only sleep quality, but the other common symptom, fatigue, which can be assessed by the Piper Fatigue Scale, may also be decreased through the intervention as an advantage. Moreover, this intervention can be taught to healthcare providers, patients and their relatives easily and be performed at home by following the picture in Appendix IX. To conclude, acupressure can be introduced to hemodialysis patients to improve their sleep quality.
Implication
The above results more or less indicated that using acupressure can improve sleep quality. It was believed that providing acupressure to hemodialysis patients can improve their quality of sleep. Overall, nurses play an important role in educational intervention regarding the use of acupressure. It is important to set up the evidence-guideline of educational intervention in the local setting in order to improve hemodialysis patients’ sleep quality.
In the previous chapter, a literature review about the effectiveness of using acupressure to improve quality of sleep for hemodialysis patients was discussed. The review showed that using acupressure as a non-pharmacological treatment is effective in improving the sleep quality of hemodialysis patients. It is essential to translate the evidence into practice in order to propose an innovation and enable patients to gain advantage from this. In this chapter, the implementation potential of the recommended innovation will be evaluated according to three components, which are the transferability of the findings, feasibility and cost-benefit ratio of the innovation (Polit & Beck, 2004).

### 3.1 Target setting

The target setting is a whole floor renal ward of a public hospital located in Kowloon, Hong Kong that is responsible for performing hemodialysis for patients. The renal nurses are responsible for providing acupressure to the patients and assessing their sleep qualities before and after the treatment.

### 3.2 Target audience

The target audience are all 18 years old or above with end-stage renal failure. Male and female patients are involved in the recommended innovation. The patient should undergo hemodialysis
that is scheduled three times per week but not emergency cases. They should be mentally fit, able to communicate, have no limb amputations and not be insulin-dependent diabetics. Moreover, those patients who have skin irrigation as a side-effect after having the recommended innovation of acupressure will be excluded.

Those patients who have hemodialysis two times per week or emergency cases will be excluded. Furthermore, the patients who are below 18-years-old, their skin is not intact or already have skin problems will not be involved in the recommended innovation.

3.3 Transferability of the findings

In the previous chapter, four studies were included and it was concluded that acupressure is effective in improving the quality of sleep for hemodialysis patients. After comparing the settings in the four studies with the target settings, it is found that the findings are transferable since the recommended innovation fits the target setting and audience.

3.3.1 Comparing the target setting and audience

In the four included studies, the patients had scheduled hemodialysis three times per week in the renal ward of different hospitals. Male and female patients were all included in the four studies and the ratio of males to females was nearly one to one in three out of four studies (Nasiri, Raei, Vatani & Khajeh-Kazemi, 2011; Shariati, Jahani, Hooshmand & Khalili, 2012; Tsay & Chen, 2003). The patients were all middle aged and the mean age ranged from 48.2 to 58.61. Two out of four studies were held in Taiwan, and were all Chinese (Tsay & Chen, 2003; Tsay, Cho & Chen,
2004). Based on the data obtained and observed in the local public hospital from January to November of 2013, the patients had scheduled hemodialysis two to three times per week in the target renal ward of the hospital. The ratio of males to females of the target patients was around one to one. Moreover, the target population was mostly Chinese with a mean age of 52.5. It is indicated from the above that the demographic features of the patients in the four studies were relatively similar to the target patients in the target setting.

3.3.2 Philosophy of care

The goal of the recommended innovation is to provide acupressure to hemodialysis patients to improve their sleep quality. The healthcare providers in the target setting will care for the patients’ physical needs. Moreover, they also provide high-quality specialized care to enable hemodialysis patients to fulfil their psychological and spiritual needs. The philosophy of care of the recommended innovation and the target setting is relatively the same. They both deliver patient-centered nursing care and high-quality holistic care to hemodialysis patients.

3.3.3 The number of patients gaining advantage from the recommended innovation

Based on the data from the target hospital, the average number of hemodialysis patients admitted to the target renal ward per year is around 100. Hence, there are about 100 hemodialysis patients who can gain benefit from this recommended innovation.

The total time required for the implementation and evaluation of the recommended innovation is not too long. At the beginning of preparing the implementation of the recommended innovation,
an in-charge committee should be formed. This committee would be responsible for delivering the assessment form for assessing the sleep quality to the head office of the hospital for approval before the intervention. Furthermore, the committee is responsible for communicating with the administrators. They will plan and organize the training workshops for the renal nurses. These will take about four weeks. Moreover, two identical training workshops will be held on two days within a week for all staff. Totally 30 staff will be divided into two groups and each group will join one of the workshops in that week. After that a pilot programme will last for four weeks. The evaluation will be started immediately after the target patients take part in the recommended innovation and continue for a week after the end of the pilot running. Consequently, the total time for implementing and evaluating the innovation is about ten weeks.

To conclude, the target ward, target audience and philosophy of care is nearly the same as the included studies. Furthermore, the total time for implementing and evaluating the innovation is not too long, about 5 weeks. It is indicated that the transferability of the innovation is quite high.

3.4 Feasibility

This recommended innovation is simple and feasible. The acupressure will be provided by renal nurses by hand, for which extra equipment is not needed. However, it is important to overcome the difficulties during the implementation of a new innovation and gain the support of administrators, different departments and involved staff.
3.4.1 Obtainability of the administrators’ support

In the previous several years, it is shown that the administrators of the target hospital support the application of the evidence-based practice of educational intervention to provide high-quality of nursing care to patients. For instance, in the renal department, an evidence-based nursing education of Tenckhoff catheter self-care to patients who undergo peritoneal dialysis has been adopted. The recommended innovation is evidence-based and can improve the sleep quality of hemodialysis patients by renal nurses performing the acupressure. Thus, it is believed that the administrators will also support this recommended innovation.

3.4.2 Interfering with current staff tasks

Not only the administrators, but the support from the ward manager and renal nurses of the target ward and other cooperative departments should not be neglected. Actually, there must be some barriers to implementing a new innovation and they should be overcome in order to gain support. Fortunately, for this recommended innovation, the cooperation with other departments is not needed. Then it mainly focuses on overcoming the barriers in the target ward.

In the renal ward, the ward manager and the renal nurses may worry about the implementation of the recommended innovation which will affect the original routine of nursing care and increase the workload. For those patients who have three times of hemodialysis per week, their duration for each hemodialysis is about four hours. Each renal nurse will look after five patients during each shift and they will take observations on vital signs hourly. The acupressure will be provided after the hemodialysis has settled down for an hour so they still can conduct hourly observations on the
patients. Thus, the original routine will not be affected much. The sleep quality assessment will take about 5 minutes and the time of the acupressure for each patient is about 15 minutes. The overall time for implementing the innovation will be 20 minutes for each patient and 2 hours for five patients. It is presented that extra manpower is not needed and the workload will not be increased a lot.

3.4.3 Independence of implementation

In the target ward, all renal nurses perform the recommended innovation anytime for the hemodialysis patients who fulfil the inclusion criteria. Obviously, nurses have the freedom to stop providing the acupressure to the patients when it is found to be not suitable.

3.4.4 Staff training, special skills and equipment

During the launch of a new innovation, a clear and thorough explanation with regard to making use of the evidence-based guideline should be given to ward managers, renal nurses and the hemodialysis patients. The ward manager is eager to promote and support the new innovation; hence the support from the ward manager is essential. Moreover, the recommended innovation is a new intervention. The hemodialysis patients may not want to try it as they may be concerned about its effectiveness and the opportunity of receiving optimal care. Thus, renal nurses should explain it to them thoroughly before the intervention. Furthermore, the renal nurses may not want to implement the new innovation because they are not convinced of its effectiveness and lack the confidence to learn the special skills. Therefore a
training workshop will be provided for renal nurses to gain confidence. In the workshop, a thorough explanation will be provided to them and it will be clarified to them that no special skill is needed to provide the acupressure. A Chinese medicine practitioner with 10 years’ experience will hold the training workshop for a total of 30 renal nurses of the renal ward. The workshop will last for two hours. In the first hour, the principles and benefits of acupressure and the evidence-based guideline on using acupressure on hemodialysis patients will be introduced and the acupressure technique will be demonstrated. Then in the next hour, the nurses will pair up to practise the acupressure; then each nurse needs to re-demonstrate it and be assessed by the practitioner.

The principles and benefits of acupressure and the demonstration of the technique of acupressure will be recorded in a digital videodisk (DVD) and introduced by the Chinese medicine practitioner, who is the consultant of the recommended innovation in-charge committee. This DVD can help current renal nurses to do revision and new staff to learn in the future. Moreover, the recommended innovation in-charge committee with four members includes one Advanced Practice Nurse and three renal nurses. The committee will prepare the pamphlet for hemodialysis patients and a problem-solving book with the usual questions about the innovation for the renal nurses. Moreover, they will answer any questions from the renal nurses during and after the pilot run. Also, the Advanced Practice Nurse of the committee will be the in-charge to reassess the nurses yearly and teach new staff in the future.

Moreover, another significant matter is funding for implementing the new innovation, which will be obtained from the renal department as there is evidence showing that it is beneficial to the patients. Fortunately, in implementing this innovation, it is only simply providing acupressure to the hemodialysis patients with the fingers and hands of the renal nurses and only use the form of
the Pittsburgh Sleep Quality Index (PSQI) (Appendix I) for assessing the sleep quality so no extra equipment needs to be purchased.

From the above information, it is shown that the recommended innovation is feasible with the support from the administrators, the ward manager and the increased agreement among renal nurses through the evidence-based guideline and the training workshop.

3.5 Cost-benefit ratio of the innovation

In assessing the implementation potential, the cost-benefit ratio of the recommended innovation should also be considered.

3.5.1 Potential advantage gained from the implementation

Sleep problems are common among hemodialysis patients. Their sleep quality can be improved through having acupressure which can be shown by assessing the Pittsburgh Sleep Quality Index before and after the intervention. When their sleep quality is better, their health and their quality of life will also be better. Moreover, their consumption of sleeping pills will be decreased. As a result, hemodialysis patients will suffer less side-effects from such pills; also the hospital expenditure on the medication will be lower.

It is a new intervention in the renal ward of providing acupressure to hemodialysis patients to improve their sleep quality. This new intervention will be delivered by the renal nurses. The job satisfaction of the renal nurses will be increased when the sleep quality of hemodialysis patients is
gradually improved after implementing the recommended innovation. This is because their evidence-based nursing care can improve the health and quality of life of hemodialysis patients. Furthermore, the fame of the hospital will be higher, as the innovation is implemented with the support of the evidence-based.

3.5.2 Potential risk during the implementation

The recommended innovation will be implemented by the renal nurses delivering acupressure to the hemodialysis patients with their fingers and hands. No adverse effect is reported by the included studies. Moreover, irritation to patients’ skin is rare.

3.5.3 Cost of the implementation

Material cost
The overall cost for setting up the innovation is about HK$23,075 (Appendix X). It includes the cost of the in-charge committee to have planned meetings before and after the pilot run and organize the staff training workshop. The time of each staff for training, the employment fee of the practitioner and the DVD for recording is also included. Moreover, the printing and photocopying fee of the notes for training, the PSQI assessment form, the guideline, the pamphlet and the problem-solving book is included. Furthermore, the total running cost of the innovation is around HK$4,898 (Appendix XI) every year. This includes the cost of the revision by renal nurses and committee to reassess them and
teach the new staff. Additionally, the printing fee of the PSQI assessment form and the pamphlet is included.

*Non-material cost*

By implementing the innovation, the workload of the renal nurses will be slightly increased; also they may be tense as they need to learn new knowledge in order to provide the new intervention. Consequently, the turnover rate will become higher and their morale will become lower. To prevent such situation, the committee can encourage nurses to discuss and share with each other and not hesitate to ask for help when necessary.

In conclusion, through the evaluation of the transferability of the findings, feasibility and cost-benefit ratio of the innovation in this chapter, it is shown that the innovation has great potential to be implemented and an evidence-based practice guideline on using acupressure to improve quality of sleep for hemodialysis patients will be introduced in Appendix XII.
Chapter 4

Implementation Plan

In the previous chapter, an evidence-based guideline on using acupressure to improve quality of sleep for hemodialysis patients was introduced according to the included studies. Moreover, after evaluation of the transferability of the findings, feasibility and cost-benefit ratio of the recommended innovation, it is indicated that the innovation has strong potential to be implemented. Therefore, an implementation plan of the evidence-based guideline is needed. In this chapter, the implementation plan containing communication plan and the pilot test plan will be discussed.

4.1 Communication Plan

It is essential to construct a communication plan, so as to obtain the support from different stakeholders for the recommended innovation and carry out the evidence-based guideline effectively.

4.1.1 Recognizing the Stakeholders

In order to get the support from different stakeholders, recognizing the stakeholders of the proposed guideline is the first stage of developing a communication plan. The main stakeholders of the proposed guideline include the renal nurses and the ward manager who are the users of the guideline and management level of the renal ward respectively. The department operation manager who is the administration level of the target hospital is also one of the main stakeholders of the
proposed guideline.

Renal Nurses of the Ward
The renal nurses will be the users of the evidence-based guideline. They will be mainly influenced by the proposed guideline because they are the frontline nurses. They are the ones who will provide acupressure to the hemodialysis patients during hemodialysis and assess the patients’ sleep quality before and after having the acupressure. As a result, the recommended innovation may increase their workload. Therefore, the proposed guideline should be explained and discussed with them thoroughly to let them state their worries so as to increase their support.

Ward Manager of the Renal Ward
The ward manager is an experienced nurse who supervises the renal ward and allocates manpower and resources of the target ward. She is responsible for making decisions on different issues of the ward which include supporting implementation of the proposed evidence-based guideline or not. Moreover, the support from the ward manager as a leader is essential because a positive attitude of the involved staff towards the proposed guideline can be developed by her support.

Department Operation Manager of the Target Hospital
The administrator of the target hospital, including the department operation manager, has an important duty to assess and approve the new recommended innovation to be carried out in a department. It is necessary to obtain the approval and economic funding from the administrator in order to carry out the proposed guideline.
4.1.2 Communication Progression and Strategies

After recognizing the stakeholders of the proposed guidelines, the sequence and strategies for approaching them is also important in order to obtain their support to initiate the change.

4.1.2.1 Initiating the Change

*Communicating with Ward Manager*

The literature review showed that sleep disorders are a common problem among hemodialysis patients and about 50% to 80% of them have this problem. This evidence will be stated to the ward manager who is the first stakeholder to be communicated with. Moreover in the target ward, six out of 10 patients complain of having sleep problems. The daily life and health of hemodialysis patients is affected greatly by their poor sleep quality. However, the current solution for managing sleep problems is pharmacological management which will cause side-effects. Therefore, it is necessary to introduce a new method of using acupressure, a non-pharmacological and non-invasive method, to improve the sleep quality of hemodialysis patients.

After discussing the background information and the need to have a new innovation to improve sleep quality for hemodialysis patients, the information obtained from the critical appraisal, the proposed guideline and the implementation potential of the new innovation will also be presented to the ward manager.

Once the proposed guideline is approved by the ward manager, it is essential to discuss with her the assignment of manpower for establishing an in-charge committee. This committee will comprise an Advanced Practice Nurse as the coordinator who has more experience and knowledge in managing different complications and three other renal nurses as members. The committee will
be responsible for communicating with other stakeholders and handle the issues with regard to the recommended innovation.

*Communicating with Department Operation Manager*

After obtaining approval from the ward manager, the department operation manager who is the administrator will be the next stakeholder to be approached. A detailed proposal about the recommended innovation, comprising the aims, need for change, the transferability of findings, feasibility, benefit, budget, time schedule and the proposed guideline on using acupressure among hemodialysis patients, will be prepared by the committee. The proposal will be presented to and discussed with the administrators during a formal department meeting. Moreover, the assessment form, Pittsburgh Sleep Quality Index (Appendix I), for assessing the sleep quality also needs to be approved by the administrators before the intervention.

*Communicating with Renal Nurses*

Finally, the renal nurses will be the last and the most important stakeholders to be talked to. A two-hour training workshop, which will be held by a Chinese medicine practitioner with 10 years’ experience, will be provided to them. During the workshop, the aims, needs, benefit of the new innovation, and the evidence-based guideline on using acupressure for hemodialysis patients will be introduced and the acupressure technique will be taught and assessed. At the end of the workshop, there is a question and answer section for them to raise their concerns and enquiries, in order to obtain their support.
4.1.2.2 Guiding the Change

At the beginning of the change, the aim of improving the sleep quality for hemodialysis patients by using acupressure, should be stated clearly to the stakeholders. In order to guide the change, a detailed timeline will be scheduled. It will take around three weeks to obtain approval from the administrators. Two identical two-hour training workshops will be held by a practitioner with 10 years’ experience within a week for 30 renal nurses and the nurses need to return demonstrate acupressure within the workshop. Then a pilot test will be run for four weeks. During and after the pilot test, the information from patients and feedback from renal nurses will be obtained; then the guideline will be evaluated and reviewed. A pamphlet for patients and a problem-solving book for nurses will be prepared by the in-charge committee. The guideline will be given to all renal nurses through internal email and several hard copies will be kept in the ward for reference.

4.1.2.3 Sustaining the Change

Sufficient support is needed so as to maintain the change. The Chinese medicine practitioner as a consultant of the in-charge committee will record a digital videodisk (DVD) with the principles, benefits and techniques of acupressure. The DVD will be kept in the ward for the renal nurses to do revision and for new renal nurses to learn. The Advanced Practice Nurse of the committee will be the in-charge to reassess the nurses yearly as an internal audit and educate the new nurses. The sleep quality of the hemodialysis patients will be monitored and the advice from the nurses will be obtained continuously, so as to modify the guideline. The evidence-based guideline will be reviewed thoroughly every two years based on the hospital policy.
4.2 Pilot Test Plan

A pilot test will be conducted before the implementation of the proposed evidence-based guideline on using acupressure to improve sleep quality for the hemodialysis patients, so as to determine its feasibility.

4.2.1 Location, Duration and Subject Enrolment Plans

The pilot test will be conducted in the target renal ward of a public hospital by the in-charge committee of the proposed guideline. It will last for a month. Sixty end-stage renal failure patients undergoing hemodialysis who meet the inclusion criteria stated in the guideline (Appendix XII) will be recruited in the test and convenience sampling will be used. All 30 renal nurses will take part in using the proposed guideline.

4.2.2 Staff Training

Two identical 2-hour training workshops will be held in two days within a week by a Chinese medicine practitioner for every renal nurse. In the workshop, the principles, benefits and techniques of acupressure will be shown. The staff will pair up for practice and re-demonstrate the technique and be evaluated by the practitioner at the end of the workshop. After the workshop, all the nurses need to complete an “Evaluation Form of Training Workshop” (Appendix XIII) to evaluate their satisfaction of the workshop.
4.2.3 Outcome Assessment

The sleep quality of the hemodialysis patients will be assessed using the Pittsburgh Sleep Quality Index (Appendix I), before and after having the acupressure. Moreover, all the involved hemodialysis patients need to complete an “Evaluation Form of Acupressure for Improving Sleep Quality” (Appendix XIV) for assessing their satisfaction with having acupressure to improve their sleep quality.

Furthermore, all renal nurses need to complete an “Evaluation Form of the Guideline” (Appendix XV) after the four-week pilot test. This helps to assess their satisfaction with the guideline, their job satisfaction and if the training is enough or not. All evaluation forms are measured using a 5-point scale, where 5 is strongly agree and 1 is strongly disagree and they will be validated by an experienced nurse, the Advanced Practice Nurse of the in-charge committee and the ward manager.

4.2.4 Evaluation of the Pilot Test

The PSQI data collected from patients and the data collected through the evaluation forms will be analyzed by the in-charge committee. Moreover, after the pilot test the in-charge committee will organize a discussion for the renal nurses to state their comments, difficulties and recommendations for improvement, in order to assess their acceptance towards the guideline and any additional support that is needed. After the analysis of all data, comments and recommendations, the guideline will be modified and reviewed.
Chapter 5
Evaluation Plan

It is necessary to construct an evaluation plan in order to assess the effectiveness of the proposed evidence-based guideline on using acupressure to improve sleep quality for hemodialysis patients.

5.1 Identification of the outcomes

Patient outcome, renal nurse outcome and system outcome are the three main outcomes to be measured in the evaluation plan.

5.1.1 Patient Outcome

Evaluating patient outcome is essential in order to assess the clinical advantages of the innovation. According to the aim of the guideline, the main outcome is to measure any improvement in the sleep quality of hemodialysis patients after having acupressure, regarding which the sleep quality is assessed by the Pittsburgh Sleep Quality Index. Patient outcomes also help to assess the effectiveness of the guideline as the included studies showed that there is direct correlation between sleep quality and using acupressure for hemodialysis patients. Furthermore, the satisfaction level of hemodialysis patients having acupressure will be evaluated.
5.1.2 Renal Nurse Outcome

The understanding of the renal nurses towards the guideline and their skills of acupressure will influence the effectiveness of the guideline. Therefore, at the end of the training workshop their skills will be re-demonstrated and assessed by the practitioner and there is a question and answer section for them to state their questions and concerns. Furthermore, in order to assess their acceptance towards the guideline, satisfaction with the implementation of the guideline and their job satisfaction will be evaluated.

5.1.3 System Outcome

The exact time to approach each hemodialysis patient to provide acupressure will be calculated and the exact cost of the new innovation comprising the training workshop and material cost will be determined by the in-charge committee. This is essential information to be evaluated because it will influence the operation of the hospital. Furthermore, the effectiveness of using the hospital resources can be shown by the exact utilization rate of the guideline.

5.2 Determination of the nature and amount of the participants involved

According to the included studies, the criteria for recruiting appropriate patients in the evaluation plan are: 1) 18-years-old or above; 2) undergoing scheduled hemodialysis three days per week in the renal ward of the target hospital; 3) without limb amputation; 4) without insulin-dependent diabetes and 5) mentally fit and able to communicate.
The amount of hemodialysis patients involved in the evaluation plan is calculated through a sample size calculator of computer software (Lenth, 2006). The global Pittsburgh Sleep Quality Index is an indicator for determining if the sleep quality is improved or not. Therefore, the sample size is calculated by identifying the difference between the mean of global PSQI between the groups. The mean global PSQI of 2.65 is selected as it is the smallest significant value obtained from the involved studies with critical appraisal (Nasiri, Raei, Vatani & Khajeh-Kazemi, 2011; Shariati, Jahani, Hooshmand & Khalili, 2012; Tsay and Chen, 2003). Applying the paired t test with power of 80%, alpha of 5% and the attribution rate of 10% which is obtained from the included studies, finally, it is determined that the sample size should be not less than 33 in the evaluation plan. Furthermore, a control group will be included in the test with usual care only, and convenience sampling will be used.

5.3 Collection of Data

5.3.1 Data about the hemodialysis patients

The innovation will be carried out for four weeks. For the hemodialysis patients, the sleep quality will be assessed by the Pittsburgh Sleep Quality Index before the intervention as a baseline, after four weeks of implementation and one week after the end of implementation, as according to the included studies the effect can last for a week after the intervention. This measurement is a short-term one and all the records will be collected by the renal nurses.

Furthermore, so as to evaluate the satisfaction level of the patients with regard to having acupressure, after implementing the innovation for four weeks, a self-filled in “Evaluation Form
of Acupressure for Improving Sleep Quality” (Appendix IVX) will be distributed to the patients and collected by the renal nurses.

5.3.2 Data about the renal nurses

For the renal nurses, the measurement of the acceptance of and satisfaction with the guideline and their job satisfaction from the guideline will be obtained after the four weeks of implementation by filling in the “Evaluation Form of the Guideline” (Appendix XV). This measurement is an intermediate one, in which nurses need to state the difficulties they came across during the implementation. The evaluation form and their recommendations will be collected by the in-charge committee within two weeks after the end of the implementation.

5.3.3 Data about the system

For the system, the time for acupressure by renal nurses and financial expenditure, comprising the material and non-material, for implementing the innovation within the four weeks will be calculated by renal nurses and in-charge committee separately. Furthermore, any extra staff or resources required will be recorded. Assessment of cost-effectiveness is a long-term process.

5.4 Analysis of Data
Sleep quality of hemodialysis patients will be assessed before the implementation and hypothesis testing will be conducted for one proportion using a two-tailed test z-test to determine if the global Pittsburgh Sleep Quality Index for assessing sleep quality will be improved after four weeks of implementation of acupressure and a week after the end of the implementation.

The mean global Pittsburgh Sleep Quality Index of the hemodialysis patients in intervention group will be compared with those in control group. The satisfaction level of the patients regarding the acupressure will be obtained from the “Evaluation Form of Acupressure for Improving Sleep Quality” (Appendix IVX), which is measured by a 5-point scale. The data will be analyzed by SPSS version 22.

For the data from the renal nurses including the acceptance of and satisfaction with the guideline and job satisfaction from the guideline will be obtained from the “Evaluation Form of the Guideline” (Appendix XV). The data will also be analyzed by SPSS version 22 as well as the descriptive suggestions and difficulties stated by the nurses in the evaluation form which will be evaluated with identification of similar themes and configurations.

All the data will be analyzed by the in-charge committee within one and a half months after all the data are collected and an evaluation report about the innovation will be issued.

5.5 Criteria to Consider the Guideline Effective

One of the criteria for considering the guideline to be effective will be improvement to the sleep quality of the hemodialysis patients after receiving acupressure. The mean global Pittsburgh Sleep Quality Index of the hemodialysis patients reducing by at least 2.56 after acupressure will mean that the guideline can be considered effective, whereas a decrease of 2.56 is the smallest significant
value obtained from the included studies with appraisal (Nasiri, Raei, Vatani & Khajeh-Kazemi, 2011; Shariati, Jahani, Hooshmand & Khalili, 2012; Tsay and Chen, 2003).

Furthermore, 80% of renal nurses and hemodialysis patients should be satisfied with the guideline and innovation which can be assessed by the evaluation form “Evaluation Form of Acupressure for Improving Sleep Quality” (Appendix IVX) and “Evaluation Form of the Guideline” (Appendix XV) respectively. In assessing their satisfaction level, 80% or more renal nurses and patients should give grade 3 or above in the evaluation form, which is neutral, agree or strongly agree. Moreover, after implementing the guideline needing no extra manpower should also be one of the criteria for considering the guideline as effective.
Chapter 6

Conclusion

Numerous hemodialysis patients have sleep problems and the pharmacological method is the main treatment for relieving this problem. According to the literature review, using acupressure, a non-pharmacological and non-invasive method, can improve hemodialysis patients’ sleep quality. There is no related guideline about this in the target hospital. Therefore, this paper aims to develop an evidence-based guideline on using acupressure to improve sleep quality for hemodialysis patients.

The evidence-based guideline was developed from the evidence from the selected randomized control trial studies with critical appraisal. The implementation potential is high which was shown from the evaluation of its feasibility, transferability and cost-benefit ratio. An implementation plan was made in order to gain support from different stakeholders. An evaluation plan was designed to evaluate the outcomes in hemodialysis patients, renal nurses and the system.

It is believed that the proposed evidence-based guideline on using acupressure can improve sleep quality for hemodialysis patients and hopefully it can be implemented in the target ward of the target hospital in the future.
References


life and mortality risk in hemodialysis patients: results from the Dialysis Outcomes and Practice Patterns Study (DOPPS). *Nephrology Dialysis Transplantation, 23*, 998-1004.


Appendix I - Pittsburgh Sleep Quality Index (PSQI)

**Instructions**: The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past months. Please answer all questions.

**During the past month,**

1. When have you usually gone to bed? __________________________
2. How long (in minutes) has it taken you to fall asleep each night? __________________________
3. When have you usually gotten up in the morning? __________________________
4. How many hours of actual sleep did you get that night? (This may be different than the number of hours you spend in bed) __________________________

5. During the past month, how often have you had trouble sleeping because you…
   - a. Cannot get to sleep within 30 minutes
   - b. Wake up in the middle of the night or early morning
   - c. Have to get up to use the bathroom
   - d. Cannot breathe comfortable
   - e. Cough or snore loudly
   - f. Feel too cold
   - g. Feel too hot
   - h. Have bad dreams
   - i. Have pain
   - j. Other reason(s), please describe, including how often you have had trouble sleeping because of this reason(s):

6. During the past month, how often have you taken medicine (prescribed or "over the counter") to help you sleep?

7. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?

8. During the past month, how much of a problem has it been for you to keep up enthusiasm to get things done?
   - Very good (0)
   - Fairly good (1)
   - Fairly bad (2)
   - Very bad (3)

9. During the past month, how would you rate your sleep quality overall?

<table>
<thead>
<tr>
<th>Component</th>
<th>#9 Score</th>
<th>C1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component 1</td>
<td>#2 Score (≤ 15min (0), 16-30 min (1), 31-60 min (2), &gt;60 min (3))</td>
<td>C1</td>
</tr>
<tr>
<td>+ #5a Score (if sum is equal 0=0; 1-2=1; 3-4=2; 5-6=3)</td>
<td>C2</td>
<td></td>
</tr>
<tr>
<td>Component 3</td>
<td>#4 Score (&gt;7 (0), 6-7 (1), 5-6(2), &lt;5 (3))</td>
<td>C3</td>
</tr>
<tr>
<td>Component 4</td>
<td>(total # of hours asleep)/ (total # of hours in bed) x 100</td>
<td>C4</td>
</tr>
<tr>
<td>&gt;85%=0, 75%-84%=1, 65%-74%=2, &lt;65%=3</td>
<td>C4</td>
<td></td>
</tr>
<tr>
<td>Component 5</td>
<td># sum of scores 5b to 5j (0=0; 1-9=1; 10-18=2; 19-27=3)</td>
<td>C5</td>
</tr>
<tr>
<td>Component 6</td>
<td>#6 Score</td>
<td>C6</td>
</tr>
<tr>
<td>Component 7</td>
<td>#7score + #8 score (0=0; 1-2=1; 3-4=2; 5-6=3)</td>
<td>C7</td>
</tr>
</tbody>
</table>

Add the seven component scores together (C1+C2+C3+C4+C5+C6+C7) **Global PSQI Score** _________
10. Do you have a bed partner or roommate?

☐ No bed partner or roommate
☐ Partner/roommate in other room
☐ Partner in same room, but not same bed
☐ Partner in same bed

If you have a roommate or bed partner, ask him/her how often in the past month you have had...
(a) Loud snoring
☐ Not during the past month ☐ Less than once a week
☐ Once or twice a week ☐ Three or more times a week
(b) Long pauses between breaths while asleep
☐ Not during the past month ☐ Less than once a week
☐ Once or twice a week ☐ Three or more times a week
(c) Legs twitching or jerking while you sleep
☐ Not during the past month ☐ Less than once a week
☐ Once or twice a week ☐ Three or more times a week
(d) Episodes of disorientation or confusion during sleep
☐ Not during the past month ☐ Less than once a week
☐ Once or twice a week ☐ Three or more times a week
(e) Other restlessness while you sleep: please describe _________________________
☐ Not during the past month ☐ Less than once a week
☐ Once or twice a week ☐ Three or more times a week

### Appendix II

The keywords used and the search result in Pubmed

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<thead>
<tr>
<th></th>
<th>Search</th>
<th>Results</th>
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</thead>
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<tr>
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<td>acupressure</td>
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</tr>
<tr>
<td>2</td>
<td>Shiatsu</td>
<td>815</td>
</tr>
<tr>
<td>3</td>
<td>Shiatzu</td>
<td>781</td>
</tr>
<tr>
<td>4</td>
<td>Zhi Ya</td>
<td>975</td>
</tr>
<tr>
<td>5</td>
<td>Chih Ya</td>
<td>781</td>
</tr>
<tr>
<td>6</td>
<td>#1 or #2 or #3 or #4 or #5</td>
<td>1009</td>
</tr>
<tr>
<td>7</td>
<td>hemodialysis</td>
<td>119236</td>
</tr>
<tr>
<td>8</td>
<td>renal dialysis</td>
<td>107251</td>
</tr>
<tr>
<td>9</td>
<td>extracorporeal dialysis</td>
<td>107584</td>
</tr>
<tr>
<td>10</td>
<td>#7 or #8 or #9</td>
<td>119521</td>
</tr>
<tr>
<td>11</td>
<td>sleep quality</td>
<td>15224</td>
</tr>
<tr>
<td>12</td>
<td>#6 and #10 and #11</td>
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</tr>
</tbody>
</table>
Appendix III

The keywords used and the search result in Cochrane Library

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<th>#</th>
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<th>Results</th>
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<td>1</td>
<td>acupressure</td>
<td>576</td>
</tr>
<tr>
<td>2</td>
<td>Shiatsu</td>
<td>36</td>
</tr>
<tr>
<td>3</td>
<td>Shiatzu</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Zhi Ya</td>
<td>45</td>
</tr>
<tr>
<td>5</td>
<td>Chih Ya</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>#1 or #2 or #3 or #4 or #5</td>
<td>627</td>
</tr>
<tr>
<td>7</td>
<td>hemodialysis</td>
<td>4230</td>
</tr>
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<td>8</td>
<td>renal dialysis</td>
<td>8317</td>
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<td>9</td>
<td>extracorporeal dialysis</td>
<td>197</td>
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<tr>
<td>10</td>
<td>#7 or #8 or #9</td>
<td>9408</td>
</tr>
<tr>
<td>11</td>
<td>sleep quality</td>
<td>4723</td>
</tr>
<tr>
<td>12</td>
<td>#6 and #10 and #11</td>
<td>10</td>
</tr>
</tbody>
</table>
### Appendix IV - Table of Evidence


<table>
<thead>
<tr>
<th>Bibliographic citation</th>
<th>Study type</th>
<th>Patient characteristics</th>
<th>Intervention(s)</th>
<th>Comparison</th>
<th>Length of follow up</th>
<th>Outcome measures</th>
<th>Effect size</th>
</tr>
</thead>
</table>
| Nasiri, Raei, Vatani & Khajeh-Kazemi, 2011 | RCT | Sex(M/F): 37/25 | • Usual care with acupressure applied 1 hour after the hemodialysis with telling readiness by patients, 3 days per week, for 4 consecutive weeks  
• First sleep on back and breathe deeply 5 times with nose and expire them with mouth  
• Acupressure at the rate of 1-2 rotations per second with finger continuously, force between 3-4 kilogram  
• Total 20 minutes, 5 minutes per acupoint  
• Acupoints including: Hand: Shenmen (H7) Neiguan (P6) Foot: Yung Quan (K1) Ear: Shenmen (H7) (n=31) | • Only routine unit care (n=31) | 5 weeks | a) Subjective sleep quality  
b) Sleep latency  
c) Sleep duration  
d) Habitual sleep efficiency  
e) Sleep disturbances  
f) Daytime functional status  
g) Use of sleeping medications  
h) Global PSQI | a) I: -0.45; C: -0.13 (p=0.042)  
b) I: -0.62; C: -0.03 (p=0.007)  
c) I: -0.86; C: -0.2 (p=0.017)  
d) I: -0.68; C: 0.12 (p=0.0001)  
e) I: -0.57; C: 0.19 (p=0.024)  
f) I: -0.34; C: -0.04 (p=0.002)  
g) I: -0.29 ; C: -0.13 (p: NS)  
h) I: -3.67; C: -0.16 (p=0.001) |

PQSI: Pittsburgh Sleep Quality Index; I: Intervention group; C: Control group; p: p-value

<table>
<thead>
<tr>
<th>Bibliographic citation</th>
<th>Study type</th>
<th>Patient characteristics</th>
<th>Intervention(s)</th>
<th>Comparison</th>
<th>Length of follow up</th>
<th>Outcome measures</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shariati, Jahani, Hooshmand &amp; Khalili, 2012</td>
<td>RCT</td>
<td>Sex(M/F): 23/21 &lt;br&gt; Mean age: 54.5 (51-60) &lt;br&gt; Mean length of dialysis: 42.35 months (3.54 years) &lt;br&gt; Pre intervention mean global PSQI score: 9.75</td>
<td>• Usual care with acupressure begin 1 hour after the hemodialysis, 3 days per week &lt;br&gt; • Acupressure was done by harmonization method using fingertips applying consistent pressure at the rate of 2 rotations per second &lt;br&gt; • Confirm by felt sore, numb, heavy, distended and or warm &lt;br&gt; • Limited 15 minutes, consisting 9 minutes of acupoints massage (3 minutes per acupoint) and 6 minutes massage area around acupoint for relaxation &lt;br&gt; • Acupoints including: Hand: Shenmen (H7) He Gu (Li4) Leg: Sanyingjiao (Sp6) (n=22, drop out=2)</td>
<td>• Only routine unit care (n=22, drop out=2)</td>
<td>5 weeks</td>
<td>a) Subjective sleep quality &lt;br&gt; b) Sleep latency &lt;br&gt; c) Sleep duration &lt;br&gt; d) Habitual sleep efficiency &lt;br&gt; e) Sleep disturbances &lt;br&gt; f) Daytime functional status &lt;br&gt; g) Use of sleeping medications &lt;br&gt; h) Global PSQI &lt;br&gt; i) Sleep log data: (1)Time awake at night &lt;br&gt; (2)Frequency of nocturnal awakenings &lt;br&gt; (3)Perception of quality of sleep</td>
<td>a) I: -1.05; C: 0.36 (p&lt;0.001) &lt;br&gt; b) I: -0.86; C: 0.36 (p&lt;0.001) &lt;br&gt; c) I: -1.13; C: 0.27 (p&lt;0.001) &lt;br&gt; d) I: -0.59; C: 0 (p=0.006) &lt;br&gt; e) I: -1.82; C: 0.91 (p&lt;0.001) &lt;br&gt; f) I: -0.69; C: 0.14 (p&lt;0.001) &lt;br&gt; g) I: -0.49; C: -0.05 (p=0.028) &lt;br&gt; h) I: -6.69; C: 2 (p&lt;0.001) &lt;br&gt; i) Subjective sleep quality improved immediately and continued until one week after treatment</td>
</tr>
</tbody>
</table>

PQSI: Pittsburgh Sleep Quality Index; I: Intervention group; C: Control group; p: p-value

<table>
<thead>
<tr>
<th>Bibliographic citation</th>
<th>Study type</th>
<th>Patient characteristics</th>
<th>Intervention(s)</th>
<th>Comparison</th>
<th>Length of follow up</th>
<th>Outcome measures</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tsay &amp; Chen, 2003</td>
<td>RCT</td>
<td>Sex(M/F): 42/56</td>
<td>• Usual care with acupressure 3 days per week, for 4 consecutive weeks and instruct not to massage any acupoints during the study period</td>
<td>Sham group: • Usual care with massage at locations with no acupoints (1cm away from meridian) at the same frequency as the intervention group</td>
<td>4 weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean age: 55.52</td>
<td>• Apply consistent pressure to acupoints with finger, force between 3-4 kilogram</td>
<td></td>
<td></td>
<td>a) Subjective sleep quality</td>
<td>I: -0.53; S: -0.63; C: 0.13 (p=0.006) (p of S and C=0.003)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean length of dialysis: 60.25 months (5.02 years)</td>
<td>• Confirm by felt sore, numb, heavy, distended and or warm</td>
<td></td>
<td></td>
<td>b) Sleep latency</td>
<td>I: -0.71; S: -0.24; C: -0.27 (p=0.142)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pre intervention mean global PSQI score: 9.63</td>
<td>• Limited 14 minutes, 5 minutes of massage to relax, 9 minutes of acupoints massage (3 minutes per acupoint)</td>
<td></td>
<td></td>
<td>c) Sleep duration</td>
<td>I: -0.32; S: 0; C: 0.47 (p=0.016) (p of I and C=0.004)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Acupoints including: Hand: Shenmen (H7) Feet: Yungchuan (KI1) Ear: Shenmen (H7)</td>
<td></td>
<td></td>
<td>d) Habitual sleep efficiency</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Control group: • Only routine unit care</td>
<td></td>
<td></td>
<td>e) Sleep disturbances</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>f) Daytime functional status</td>
<td>I: -0.58; S: -0.2; C: 0.6 (p=0.003) (p of I and C=0.001)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>g) Use of sleeping medications</td>
<td>I: 0.12; S: -0.04; C: 0.1 (p=0.608) (p of I and C=0.04)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>h) Global PSQI</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>i) Sleep log data:</td>
<td>(1) Decreased (p =0.05)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(2)Frequency of nocturnal awakenings</td>
<td>(2)Not significant (p&gt;0.05)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(3)Perception of quality of sleep</td>
<td>(3) Improved (p = 0.002)</td>
<td></td>
</tr>
</tbody>
</table>

PQSI: Pittsburgh Sleep Quality Index; I: Intervention group; S: Sham group; C: Control group; p: p-value

<table>
<thead>
<tr>
<th>Bibliographic citation</th>
<th>Study type</th>
<th>Patient characteristics</th>
<th>Intervention(s)</th>
<th>Comparison</th>
<th>Length of follow up</th>
<th>Outcome measures</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tsay, Cho &amp; Chen, 2004</td>
<td>RCT</td>
<td>Sex(M/F): 36/70</td>
<td>• Usual care with 3 days per week, for 4 consecutive weeks and instruct not to massage any acupoints during the study period</td>
<td>• Only routine unit care</td>
<td>4 weeks</td>
<td>a) Global PSQI b) Piper Fatigue Scale c) Beck Depression Inventory</td>
<td>a) I: -1.31; C: -0.31 (p=0.05) b) I: -1.05; C: 0.4 (p=0.006) c) I: -6.85; C: -2.73 (p=0.009)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean age: 58.61</td>
<td>• Apply consistent pressure to acupoints with finger, force between 3-4 kilogram</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean length of dialysis: 50.06 months (4.17 years)</td>
<td>• Confirm by felt sore, numb, heavy, distended and or warm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pre intervention mean global PSQI score: 8.44</td>
<td>• Limited 15 minutes, 3 minutes of massage to relax, 12 minutes of acupoints massage (3 minutes per acupoint)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Acupoints including: Feet: Yungchuan (K1) Leg: Zusanli (St36) Yanglingchuan (Gb34) Sanyingjiao (SP6)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>(n=35, drop out=1)</td>
<td></td>
<td></td>
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PQSI: Pittsburgh Sleep Quality Index; I: Intervention group; C: Control group; p: p-value
Appendix V-Checklist of the SIGN


SECTION 1: INTERNAL VALIDITY

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<tr>
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<th>In a well conducted RCT study…</th>
<th>Does this study do it?</th>
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<tbody>
<tr>
<td>1.1</td>
<td>The study addresses an appropriate and clearly focused question.</td>
<td>Yes. The aim of study was clearly stated in the introduction.</td>
</tr>
<tr>
<td>1.2</td>
<td>The assignment of subjects to treatment groups is randomized.</td>
<td>Yes. Sample are randomly assigned into intervention and control group.</td>
</tr>
<tr>
<td>1.3</td>
<td>An adequate concealment method is used</td>
<td>No. Concealment method is not stated, indicating that this aspect of study design was ignored.</td>
</tr>
<tr>
<td>1.4</td>
<td>Subjects and investigators are kept ‘blind’ about treatment allocation.</td>
<td>No. Blinding method was not stated, indicating that this aspect of study design was ignored.</td>
</tr>
<tr>
<td>1.5</td>
<td>The treatment and control groups are similar at the start of the trial.</td>
<td>Yes. No significant differences between the patients in treatment and control groups when analyzed for demographic factors, mean duration of dialysis treatment, the mean global PQSI score.</td>
</tr>
<tr>
<td>1.6</td>
<td>The only difference between groups is the treatment under investigation.</td>
<td>Yes. The only difference between the groups was having acupressure during hemodialysis which is the intervention under study.</td>
</tr>
<tr>
<td>1.7</td>
<td>All relevant outcomes are measured in a standard, valid and reliable way.</td>
<td>Yes. The sleep quality were measured by the PQSI score and sleep log.</td>
</tr>
<tr>
<td>1.8</td>
<td>What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?</td>
<td>Control group: 0  Treatment group: 0</td>
</tr>
<tr>
<td>1.9</td>
<td>All the subjects are analyzed in the groups to which they were randomly allocated (often referred to as intention to treat analysis).</td>
<td>Yes. 100% of the patients had completed the study.</td>
</tr>
<tr>
<td>1.10</td>
<td>Where the study is carried out at more than one site, results are comparable for all sites.</td>
<td>Does not apply. Study was conducted in one hospital.</td>
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SECTION 2: OVERALL ASSESSMENT OF THE STUDY

<table>
<thead>
<tr>
<th></th>
<th>How well was the study done to minimize bias? Code ++, +, or -</th>
<th>1+</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain that the overall effect is due to the study intervention?</td>
<td>Fair. No power calculation was made but the sample size may be acceptable.</td>
</tr>
<tr>
<td>2.2</td>
<td>Are the results of this study directly applicable to the patient group targeted by this guideline?</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Study identification:

**SECTION 1: INTERNAL VALIDITY**

| 1.1 | The study addresses an appropriate and clearly focused question. | Yes. The aim of study was clearly stated in the introduction |
| 1.2 | The assignment of subjects to treatment groups is randomized. | Yes, by simple randomization method |
| 1.3 | An adequate concealment method is used | No. Concealment method is not stated, indicating that this aspect of study design was ignored. |
| 1.4 | Subjects and investigators are kept “blind” about treatment allocation. | Yes, single blind to interviewer and care providers |
| 1.5 | The treatment and control groups are similar at the start of the trial. | Yes. No significant differences between the patients in treatment and control groups when analyzed for demographic factors, mean hemodialysis duration, hemodialysis duration distribution, mean blood urea, creatinine and hemoglobin, the mean global PQSI score. |
| 1.6 | The only difference between groups is the treatment under investigation. | Yes. The only difference between the groups was having acupressure during hemodialysis which is the intervention under study. |
| 1.7 | All relevant outcomes are measured in a standard, valid and reliable way. | Yes. The sleep quality were measured by the PQSI score. |
| 1.8 | What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed? | Control group: 8.3% (2 dropped out)  
Treatment group: 8.3% (2 dropped out) |
| 1.9 | All the subjects are analyzed in the groups to which they were randomly allocated (often referred to as intention to treat analysis). | No. Intention-to-treat analysis was not mentioned. |
| 1.10 | Where the study is carried out at more than one site, results are comparable for all sites. | No. The study results were not comparable for the two university hospitals. |

**SECTION 2: OVERALL ASSESSMENT OF THE STUDY**

| 2.1 | How well was the study done to minimize bias? Code ++, +, or - | 1+ |
| 2.2 | Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain that the overall effect is due to the study intervention? | No. No power calculation was made. The sample size may not be sufficient to report the effectiveness of intervention. |
| 2.3 | Are the results of this study directly applicable to the patient group targeted by this guideline? | Yes |

**SECTION 1: INTERNAL VALIDITY**

<table>
<thead>
<tr>
<th>In a well conducted RCT study…</th>
<th>Does this study do it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 The study addresses an appropriate and clearly focused question.</td>
<td>Yes. The aim of study was clearly stated in the introduction.</td>
</tr>
<tr>
<td>1.2 The assignment of subjects to treatment groups is randomized.</td>
<td>Yes. By the blind randomization.</td>
</tr>
<tr>
<td>1.3 An adequate concealment method is used</td>
<td>No. Concealment method is not stated, indicating that this aspect of study design was ignored.</td>
</tr>
<tr>
<td>1.4 Subjects and investigators are kept ‘blind’ about treatment allocation.</td>
<td>Care providers (physicians, nurses, dieticians, social worker) and two trained research assistant who collected all the data were blind.</td>
</tr>
<tr>
<td>1.5 The treatment and control groups are similar at the start of the trial.</td>
<td>Yes. No significant differences between the patients in treatment, sham and control groups when analyzed for demographic factors, current use of medication, no. of chronic disease and the length being on dialysis, the mean global PQSI score.</td>
</tr>
<tr>
<td>1.6 The only difference between groups is the treatment under investigation.</td>
<td>Yes. The only difference between the groups was having acupressure during hemodialysis which is the intervention under study.</td>
</tr>
<tr>
<td>1.7 All relevant outcomes are measured in a standard, valid and reliable way.</td>
<td>Yes. The sleep quality were measured by the PQSI score and sleep log.</td>
</tr>
<tr>
<td>1.8 What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?</td>
<td>7 dropped out</td>
</tr>
<tr>
<td>1.9 All the subjects are analyzed in the groups to which they were randomly allocated (often referred to as intention to treat analysis).</td>
<td>No. Intention-to-treat analysis was not mentioned.</td>
</tr>
<tr>
<td>1.10 Where the study is carried out at more than one site, results are comparable for all sites.</td>
<td>No. The study results were not comparable for the four hospitals.</td>
</tr>
</tbody>
</table>

**SECTION 2: OVERALL ASSESSMENT OF THE STUDY**

| How well was the study done to minimize bias? Code ++, +, or - | 1+ |
| Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain that the overall effect is due to the study intervention? | Fair. No power calculation was made but the sample size may be acceptable. |
| Are the results of this study directly applicable to the patient group targeted by this guideline? | Yes |

**SECTION 1: INTERNAL VALIDITY**

In a well conducted RCT study…

<table>
<thead>
<tr>
<th>Does this study do it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 The study addresses an appropriate and clearly focused question.</td>
</tr>
<tr>
<td>1.2 The assignment of subjects to treatment groups is randomized.</td>
</tr>
<tr>
<td>1.3 An adequate concealment method is used</td>
</tr>
<tr>
<td>1.4 Subjects and investigators are kept ‘blind’ about treatment allocation.</td>
</tr>
<tr>
<td>1.5 The treatment and control groups are similar at the start of the trial.</td>
</tr>
<tr>
<td>1.6 The only difference between groups is the treatment under investigation.</td>
</tr>
<tr>
<td>1.7 All relevant outcomes are measured in a standard, valid and reliable way.</td>
</tr>
<tr>
<td>1.8 What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?</td>
</tr>
<tr>
<td>1.9 All the subjects are analyzed in the groups to which they were randomly allocated (often referred to as intention to treat analysis).</td>
</tr>
<tr>
<td>1.10 Where the study is carried out at more than one site, results are comparable for all sites.</td>
</tr>
</tbody>
</table>

**SECTION 2: OVERALL ASSESSMENT OF THE STUDY**

<table>
<thead>
<tr>
<th>2.1 How well was the study done to minimize bias? Code ++, +, or -</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2 Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain that the overall effect is due to the study intervention?</td>
</tr>
<tr>
<td>2.3 Are the results of this study directly applicable to the patient group targeted by this guideline?</td>
</tr>
</tbody>
</table>
Appendix VI - Level of Evidence from Scottish Intercollegiate Guidelines Network (Scottish Intercollegiate Guidelines Network, 2014)

<table>
<thead>
<tr>
<th>Level of Evidence</th>
<th>Evidence Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1++</td>
<td>High quality meta-analyses, systematic reviews of randomised controlled trials (RCTs), or RCTs with a very low risk of bias</td>
</tr>
<tr>
<td>1+</td>
<td>Well conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias</td>
</tr>
<tr>
<td>1-</td>
<td>Meta-analyses, systematic reviews of RCTs, or RCTs with high risk of bias</td>
</tr>
<tr>
<td>2++</td>
<td>High quality systematic reviews of case control or cohort studies. High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal.</td>
</tr>
<tr>
<td>2+</td>
<td>Well-conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal</td>
</tr>
<tr>
<td>2-</td>
<td>Case control or cohort studies with high risk of confounding or bias and a significant risk that the relationship is not causal</td>
</tr>
<tr>
<td>3</td>
<td>Non-analytic studies, e.g. case reports, case series</td>
</tr>
<tr>
<td>4</td>
<td>Expert opinion</td>
</tr>
</tbody>
</table>
Appendix VII - The Picture of Different Acupoints

Ear

(a) Shenmen (H 7)

Hand

(b) Shenmen (H7)

(c) Neiguan (P6)

(d) HeGu (Li4)
Appendix VII- The Picture of Different Acupoints (Cont’d)

Leg

(e) Sanyingjiao (SP6)  (f) Zusanli (St 36)

(g) Yanglingchuan (Gb34)

Foot

(h) Yungquan/Yungchuan (K1)
Source from:

Picture of (a) Shemen (H7) of ear, (b) Shemen (H7) of hand & (e) Sanyingjao (SP6) from Reza, Kian, Pouresmail, Masood, Bagher & Cheraghi (2010); (f) Zusanli (St 36) from Yi, et al. (2013); (d) HeGu (Li4) and (g) Yanglingchuan (Gb34) from Yang, Cai & Wu (1989); (c) Neiguan (P6) and (h) Yungquan/Yungchuan (K1) from Nasiri, Raei, Vatani and Khajeh-Kazemi (2011).
Appendix VIII – Table with the result of different acupoints applied in different research studies

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ear</strong></td>
<td>Shenmen (H7)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Hand</strong></td>
<td>Shenmen (H7)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Neiguan (P6)</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HeGu (Li4)</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Leg</strong></td>
<td>Sanyingjiao (SP6)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Zusanli (St 36)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Yanglingchuan (Gb34)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Foot</strong></td>
<td>Yungquan or Yungchuan (K1)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

“✓” represents applied
Appendix IX – The Pictures of Acupoints for Improving Sleep Quality Provided to Patients and Relatives

**Hand**

a) Shenmen (H7)  
b) HeGu (Li4)

**Leg**

c) Sanyingjao (SP6)

Source from

(a) Shemen (H7) of hand & (c) Sanyingjao (SP6) from Reza, Kian, Pouresmail, Masood, Bagher & Cheraghi (2010);  
(b) HeGu (Li4) from Yang, Cai & Wu (1989).
Appendix X - Set up costs on new innovation

<table>
<thead>
<tr>
<th>Item</th>
<th>Time &amp; Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Committee meeting cost with 1 Advanced Practice Nurse and 3 renal nurses (2 hours per week for four weeks)</td>
<td>2 hours x 4 weeks x 3 renal nurses &amp; 1 Advanced Practice Nurse (HK $239/hour for Advanced Practice Nurse; HK $190/ hour for renal nurse)</td>
<td>HK $6,472</td>
</tr>
<tr>
<td>Staff training workshop cost (2 hours each workshop)</td>
<td>2 hours x 30 renal nurses (HK $190/hour for renal nurse)</td>
<td>HK $11,400</td>
</tr>
<tr>
<td>Employment fee of the Chinese medicine practitioner (2 sections of 2 hours workshop)</td>
<td>HK $1000 x 2 hours x 2 sections</td>
<td>HK $4,000</td>
</tr>
<tr>
<td>Material cost:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- DVD for recording</td>
<td></td>
<td>HK $3</td>
</tr>
<tr>
<td>- Printing and photocopying of notes for training, the PSQI assessment form, the guideline, the pamphlet and the problem-solving book</td>
<td></td>
<td>HK $1,200</td>
</tr>
<tr>
<td>Total set up cost</td>
<td></td>
<td>HK $23,075</td>
</tr>
</tbody>
</table>
Appendix XI – Running costs of new innovation every year

<table>
<thead>
<tr>
<th>Item</th>
<th>Time &amp; Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revision and reassess of renal nurse</td>
<td>0.5hour x 30 renal nurses (HK $190/hour)</td>
<td>HK $2,850</td>
</tr>
<tr>
<td>Teaching the new staff by Advanced Practice Nurse of the committee</td>
<td>2 hours x 3 renal nurses and 1 Advanced Practice Nurse (HK $239/hour for Advanced Practice Nurse; HK $190/hour for renal nurse)</td>
<td>HK $1,048</td>
</tr>
<tr>
<td>Material cost:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Printing and photocopying of notes for training, the PSQI assessment form and the pamphlet</td>
<td></td>
<td>HK $1,000</td>
</tr>
<tr>
<td><strong>Total set up cost</strong></td>
<td></td>
<td>HK $4,898</td>
</tr>
</tbody>
</table>
Appendix XII - An Evidence-based Guideline on Using Acupressure to Improve Quality of Sleep for Hemodialysis Patients

This evidence-based guideline is established according to the recommendations of the included studies that previously with critical appraisal in chapter 2. The evidence and the recommendation were evaluated based on the Scottish Intercollegiate Guidelines Network, 2014. The levels of evidence were ranged from 1++ to 4 and the grades of the recommendation were graded from A to E.

Objectives of the guideline

• To improve the quality of sleep for the hemodialysis patients by using the acupressure under an evidence-based guideline with best practice.

• To instruct and assist the renal nurse to provide acupressure according to the evidence for improving the quality of sleep for the hemodialysis patients.

• To make sure the hemodialysis patients can receive care that is optimal, standardized and evidence-based.

Intended User of the guideline

Nurses in the hemodialysis settings
Target Population of the guideline

The target group of the guideline comprises all end-stage renal failure patients undergo hemodialysis with the following inclusive criteria:

- 18 years old or above
- Undergo scheduled hemodialysis with three days per week
- Without limb amputation
- Without insulin-dependent diabetics
- Mentally fit and able to communicate

Recommendation 1

Assessing the quality of sleep of the hemodialysis patients by the Pittsburgh Sleep Quality Index.

Evidence:

The quality of sleep of the hemodialysis patients were assessed by the Pittsburgh Sleep Quality Index (PSQI). The global PSQI score over 5 is distinguished as poor sleeper.

(Nasiri, Raei, Vatani & Khajeh-Kazemi, 2011; Shariati, Jahani, Hooshmand & Khalili, 2012; Tsay & Chen, 2003; Tsay, Cho & Chen, 2004). (1+; 1+; 1+; 1+)

Grade of recommendation: A
Recommendation 2

Providing acupressure to hemodialysis patients after the hemodialysis was undergone for 1 hour.

Evidence:
The acupressure applied 1 hour after the hemodialysis with telling readiness by patient (Nasiri, Raei, Vatani & Khajeh-Kazemi, 2011; Shariati, Jahani, Hooshmand & Khalili, 2012). (1+; 1+)

Grade of recommendation: A

Recommendation 3

Applying acupressure to the acupoints at the hand including Shenmen (H7) and He Gu (Li4) and acupoint of Sanyingjao (Sp6) at the leg to improve the sleep quality for hemodialysis patients.

Evidence:
The combination of the acupoints of Shenmen (H7), He Gu (Li4) and Sanyingjao (Sp6) is more effective to improve sleep quality for the hemodialysis patients when compare with other studies as the PSQI with the 7 components including subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, daytime
functional status and use of sleeping medications all have significant difference
(Shariati, Jahani, Hooshmand & Khalili, 2012). (1+)

*Grade of recommendation: A*

**Recommendation 4**

Providing acupressure limited to 15 minutes, each acupoint massage 3 minutes, therefore containing 9 minutes of acupoints massage, and 6 minutes massage area around the acupoint for relaxation.

*Evidence:*

The acupressure provided with 9 minutes of acupoints massage, 3 minutes per acupoint and 6 minutes massage area around acupoint for relaxation, total limited to 15 minutes.

(Shariati, Jahani, Hooshmand & Khalili, 2012). (1+)

The acupressure provided 9 minutes of acupoints massage, 3 minutes per acupoint, and also with massage around the acupoint area for 5 minutes (Tsay, Cho & Chen, 2004). (1+)

The acupressure provided with 12 minutes of acupoints massage, 3 minutes per acupoint and 3 minutes of massage to relax, total limited to 15 minutes (Tsay & Chen, 2003). (1+)

*Grade of recommendation: A*
Recommendation 5

Applying acupressure at the rate of 1-2 rotations per second with finger tips continuously.

Evidence:

Acupressure was done by harmonization method using finger tips applying consistent pressure at the rate of 2 rotations per second. (Nasiri, Raei, Vatani & Khajeh-Kazemi, 2011; Shariati, Jahani, Hooshmand & Khalili, 2012; Tsay & Chen, 2003; Tsay, Cho & Chen, 2004). (1++; 1++; 1++; 1+)

Grade of recommendation: A

Recommendation 6

Confirming the acupressure by the feeling of sore, numb, heavy, distended and or warm.

Evidence:

The acupressure is confirmed by the felt of sore, numb, heavy, distended and or warm Shariati, Jahani, Hooshmand & Khalili, 2012; Tsay & Chen, 2003; Tsay, Cho & Chen, 2004). (1++; 1++; 1+)

Grade of recommendation: A
Appendix XIII - Evaluation Form of Training Workshop

Please “✓” the suitable boxes that represent your satisfaction level about having the training workshop on using acupressure to improve sleep quality for hemodialysis patients.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The content of presentation is clear and easy to understand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information about new guideline is useful</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Session of demonstration and re-demonstration of acupressure technique is useful.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The content of workshop is relevant.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trainers are competent in related area.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The duration of workshop is convenient.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The venue of workshop is suitable.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am satisfied with the overall training workshop.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Scores: Strongly Agree, 5; Agree, 4; Neutral, 3; Disagree, 2; Strongly Disagree, 1
### Appendix XIV - Evaluation Form of Acupressure for Improving Sleep Quality

Please “✓” the suitable boxes that represent your satisfaction level on the improvement of your sleep quality after having acupressure

<table>
<thead>
<tr>
<th></th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am satisfied with the acupressure provided by renal nurse.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acupressure provided is useful in improving sleep quality.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The side effect(s) of acupressure provided is minimal.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I will suggest acupressure intervention to other hemodialysis patients for improve sleep quality.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Scores: *Strongly Agree, 5; Agree, 4; Neutral, 3; Disagree, 2; Strongly Disagree, 1*
Appendix XV- Evaluation Form of the Guideline

Please “✓” the suitable boxes that represent your satisfaction level about applying the guideline on using acupressure to improve sleep quality for hemodialysis patients.

<table>
<thead>
<tr>
<th>Satisfaction of Guideline</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The acupressure guideline is clear and concise.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The acupressure guideline is easy to follow.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am satisfied with the organization and recommendation of acupressure guideline.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• What is/ are the reason(s) for you are satisfied/ dissatisfied?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• What difficulty (ies) did you encounter during the implementation?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The training from the workshop is adequate for implementing the guideline.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Job Satisfaction</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>My job satisfaction is increased by the acupressure guideline.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My work autonomy is improved from the acupressure guideline.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Scores: Strongly Agree, 5; Agree, 4; Neutral, 3; Disagree, 2; Strongly Disagree, 1