

**FACTORS AFFECTING SLEEP
DISTURBANCES AMONG HOSPITALIZED
GERIATRIC PATIENTS IN HOSPITAL
UNIVERSITI SAINS MALAYSIA, KUBANG
KERIAN, KELANTAN**

AWATIF BINTI MOHD RUSLI

**SCHOOL OF HEALTH SCIENCES
UNIVERSITI SAINS MALAYSIA**

2013

**FACTORS AFFECTING SLEEP
DISTURBANCES AMONG HOSPITALIZED
GERIATRIC PATIENTS IN HOSPITAL
UNIVERSITI SAINS MALAYSIA, KUBANG
KERIAN, KELANTAN**

by

AWATIF BINTI MOHD RUSLI

**Dissertation submitted in partial fulfilment of the
requirements for the degree of
Bachelor of Health Sciences (Nursing)**

JUNE 2013

ACKNOWLEDGEMENT

Upon the completion of my research work, I would like to firstly thank to God for His blessings so that I can successfully complete it. Next, I gratefully acknowledge my supervisor, Madam Rahimah Mohd Anshari for her thoughtful comments and support, starting from proposal preparation until completion of dissertation writing. Her constructive, meaningful and practical suggestions made the task of editing this report considerably easier.

Also, thanks to the Dean of School of Health Sciences, Universiti Sains Malaysia, Research Ethical Committee (Human) and Director of Hospital Universiti Sains Malaysia for their approval to conduct this study. Apart from that, thanks as well to the sisters and nurses of 2 Intan, 3 Utara, 4 Utara, 4 Selatan, 7 Utara and 7 Selatan, Pusat Bahasa lecturer, Miss Siti Aishah and master student, for their help and kindness. With deep regard, I acknowledge the participants which were willing to participate in this study. My special thanks go to my dearest parents, Mohd Rusli bin Husain and Faridah binti Hj. Mohamad, for their pray and encouragement for me to bring this research work done.

Last but not least, I would like to express my sincere gratitude toward all my course mates and friends for their support, help and guidance in completing this study. I am deeply indebted to many other people who have tendered their kind assistance and support during this research work.

TABLE OF CONTENTS

	Pages
DECLARATION.....	i
CERTIFICATE.....	ii
ACKNOWLEDGEMENT.....	iii
CONTENTS.....	viii
LIST OF TABLES.....	ix
LIST OF FIGURES.....	x
LIST OF ABBREVIATIONS.....	xi
ABSTRACT.....	xii
ABSTRAK.....	xiii

CHAPTER 1: INTRODUCTION

1.1 Background of The Study.....	1
1.2 Problem Statement.....	4
1.3 Research Objectives	7
1.3.1 Specific Objectives.....	7
1.4 Research Questions.....	8
1.5 Research Hypotheses.....	9
1.6 Definition of Terms (Conceptual/Operational).....	11
1.7 Significance of The Study.....	12

CHAPTER 2: LITERATURE REVIEW

2.1	Introduction.....	13
2.2	Review of literature	
2.2.1	Prevalence of sleep disturbances among elderly during hospitalization	14
2.2.2	Association of socio-demographic data with sleep disturbances	15
2.2.3	Factors affecting sleep disturbances among geriatric patient during hospitalization	16
2.2.4	Sleep disturbances lead to daytime sleepiness and other effects	17
2.3	Conceptual / Theoretical Framework.....	19

CHAPTER 3: RESEARCH METHODOLOGY

3.1	Research Design.....	22
3.2	Population and Setting.....	22
3.3	Sampling Plan.....	
3.3.1	Sample	23
3.3.2	Sampling Method.....	23
3.3.3	Sampling Size.....	24

3.4	Variables	24
3.4.1	Variables Measurement	25
3.5	Instrumentation.....	
3.5.1	Instrument.....	27
3.5.2	Translation of Instrument.....	27
3.5.3	Validity and Reliability.....	27
3.6	Ethical Considerations.....	28
3.7	Data Collection Plan.....	29
3.6.1	Flow Chart of Data Collection.....	30
3.8	Data Analysis.....	31

CHAPTER 4: DATA ANALYSIS AND RESULTS

4.1	Socio-demographic characteristics.....	32
4.2	Prevalence of sleep disturbances among hospitalized geriatric patients in Hospital Universiti Sains Malaysia.....	33
4.3	Environmental factors, psychological factors and physiological factor of pain that may or may not contribute to sleep disturbances among participants.....	35
4.4	Degree of daytime sleepiness may or may not resulting from sleep disturbances among participants.....	38
4.5	The relationship between socio-demographic characteristics and sleep disturbances among participants.....	38

4.6	The relationship between environmental factors, psychological factors and physiological of pain with sleep disturbances among participants.....	40
4.7	The relationship between sleep disturbances and degree of daytime sleepiness among participants.....	43

CHAPTER 5: DISCUSSION

5.1	The prevalence of sleep disturbances among hospitalized geriatric patients.....	44
5.2	Relationship between socio-demographic characteristics and sleep disturbances among hospitalized geriatric patients in Hospital Universiti Sains Malaysia.....	45
5.3	Relationship between the environmental factors, psychological factors and physiological factor of pain with sleep disturbances among hospitalized geriatric patients in Hospital Universiti Sains Malaysia.....	47
5.4	Relationship between sleep disturbances and degree of daytime sleepiness among hospitalized geriatric patients in Hospital Universiti Sains Malaysia.....	49

CHAPTER 6: CONCLUSION & RECOMMENDATIONS

6.1	Conclusion.....	50
6.2	Strengths and limitations.....	
6.2.1	Strengths of the study.....	51

6.2.2 Limitations of the study.....	51
6.3 Implications and recommendations.....	
6.3.1 Nursing practice.....	52
6.3.2 Nursing education.....	53
6.3.3 Nursing research.....	53
6.3.4 Theoretical implication.....	54
REFERENCES	55
APPENDIXES	
Appendix 1 Research Information for Patient.....	61
Appendix 2 Maklumat Kajian bagi Pesakit.....	64
Appendix 3 Patient Information and Consent Form.....	67
Appendix 4 Borang Keizinan Pesakit.....	68
Appendix 5 Questionnaires Form.....	69
Appendix 6 Sample Size Calculator by Raosoft. Inc.....	82
Appendix 7 Permission to use Questionnaire.....	84
Appendix 8 Ethical Approval Letter.....	86
Appendix 9 Permission to conduct the study.....	87

LIST OF TABLES

	PAGE
Table 4.1 Frequency and percentage of socio-demographic characteristics among respondents (n = 100)	32
Table 4.2 Frequency and percentage of 5 RCSQ questions (n = 100)	34
Table 4.3 The frequency and percentage of sleep quality based on mean score of total 5 questions RCSQ (n = 100)	35
Table 4.4 The frequency and percentage of environmental factors, psychological factors and physiological factor of pain (n = 100)	36
Table 4.5 The frequency and percentage of degree of daytime sleepiness among hospitalized geriatric patients in Hospital USM (n = 100)	38
Table 4.6 The relationship between socio-demographic characteristics and sleep disturbances (n=100)	39
Table 4.7 The relationship between environmental factors and sleep disturbances (n=100)	40
Table 4.8 The relationship between psychological factors and sleep disturbances (n=100)	42
Table 4.9 The relationship between physiological factor of pain with sleep disturbances (n = 100)	42
Table 4.10 The relationship between sleep disturbances and degree of daytime sleepiness (n=100)	43

LIST OF FIGURES

	PAGE
Figure 3.1	
Flow Chart of Data Collection	30

LIST OF ABBREVIATIONS

EDS	Excessive Daytime Sleepiness
ICU	Intensive Care Unit
NREM	Non – Rapid Eye Movement
RCSQ	Richards Campbell Sleep Questionnaire
REM	Rapid Eye Movement

**FACTORS AFFECTING SLEEP DISTURBANCES AMONG HOSPITALIZED
GERIATRIC PATIENTS IN HOSPITAL UNIVERSITI SAINS MALAYSIA,
KUBANG KERIAN, KELANTAN**

ABSTRACT

Complaints of an inability to sleep are common occurrences during hospitalization of elderly people and often left unmanaged. The aim of this descriptive study is to determine the factors affecting sleep disturbances among geriatric patients during hospitalization in Hospital Universiti Sains Malaysia. A purposive sample of 100 geriatric patients who were admitted to the selected surgical and medical ward were included in this study. Data was collected through a modified questionnaire combination from past study literatures and worldwide hospital's visual analogue scale of pain and anxiety. Data analysis was done by using SPSS software 20.0. Based on descriptive analysis, the prevalence of sleep disturbances among hospitalized geriatric in Hospital Universiti Sains Malaysia is 47%. Chi-Square Test was used to test the relationship between environmental factors, psychological factors and physiological factor with sleep disturbances. Apart from that, the test also was used to study the relationship between sleep disturbances and degree of daytime sleepiness. The results shows that there is a significant relationship between environmental factor of noise and sleep disturbances with $p = 0.031$. Two sources of noise, talking and walking also show a significant relationship with sleep disturbances with $p = 0.027$ and $p = 0.021$ respectively. Findings from the study show a significant relationship between sleep disturbances and degree of daytime sleepiness with $p = 0.006$. In conclusion, once the contributing factors known, appropriate interventions could be implemented to minimize the occurrences.

**FAKTOR – FAKTOR PENYEBAB GANGGUAN TIDUR DALAM KALANGAN
PESAKIT GERIATRIK SEMASA HOSPITALISASI DI HOSPITAL UNIVERSITI
SAINS MALAYSIA, KUBANG KERIAN, KELANTAN**

ABSTRAK

Aduan tentang ketidakupayaan untuk tidur semasa hospitalisasi kerap berlaku dalam kalangan pesakit tua dan perkara ini sering diabaikan. Kajian deskriptif ini dijalankan bertujuan untuk menentukan faktor yang mempengaruhi gangguan tidur dalam kalangan pesakit geriatrik di Hospital Universiti Sains Malaysia. Seramai 100 orang pesakit geriatrik yang dimasukkan ke wad- wad terpilih telah menyertai kajian ini. Data kajian telah dikumpul melalui soalan kaji selidik yang telah diubahsuai hasil gabungan daripada literatur-literatur kajian lalu. Analisis data telah dilakukan dengan menggunakan perisian SPSS 20.0. Menurut analisis deskriptif, kelaziman gangguan tidur dalam kalangan pesakit geriatrik yang dihospitalisasikan di Hospital Universiti Sains adalah sebanyak 47%. Ujian Khi Kuasa Dua telah digunakan untuk mengkaji perhubungan antara faktor persekitaran, faktor psikologi dan faktor fisiologi dengan gangguan tidur. Ujian ini juga digunakan untuk mengkaji perhubungan antara gangguan tidur dan tahap mengantuk siang hari. Keputusan ujian menunjukkan perkaitan yang ketara antara faktor persekitaran bunyi dengan gangguan tidur, $p = 0.031$. Dua sumber bunyi, iaitu percakapan dan pergerakan juga menunjukkan perkaitan yang ketara dengan gangguan tidur, iaitu $p = 0.027$ dan $p = 0.021$ untuk setiap satunya. Selain itu, hasil ujian turut menunjukkan perkaitan yang ketara antara gangguan tidur dan tahap mengantuk siang hari, $p = 0.006$. Kesimpulannya, apabila faktor penyumbang diketahui, perlaksanaan-perlakuan yang sesuai akan dapat dilaksanakan untuk mengurangkan masalah ini.

CHAPTER 1

INTRODUCTION

1.1 Background of The Study

According to Department of Health and Human Services, Administration on Aging (2011), there were 39.6 million of the older population who are 65 years and above in 2009. This population represented 12.9% of the U.S. population, which is about one in every eight Americans. People who are over 65 years that represented 12.4% of the population in the year 2000 are expected to grow to be 19% of the population by 2030. Thus, it is estimated that there will be about 72.1 million of older persons in 2030, represented more than twice of their number in 2000.

In addition, the older population also is expected to grow in Asia's population. Based on Asia's Ageing Population 2010, the number of people aged 65 years and above is expected to grow dramatically over the next 50 years all across Asia. For the region as a whole, the population in this age group will increase by 314 percent from 207 million in 2000 to 857 million in 2050. According to Population and Housing Census of Malaysia 2010, as compared to 3.9 per cent of older population in 2000, the proportion of this population had increased to 5.1 per cent. Malaysia's population is in transition of age structure towards aging population. (Department of Statistics Malaysia, 2011) .

Due to normal physical, physiological and psychological changes in ageing process, the elderly people are vulnerable towards illness. Therefore, hospitalization is common among this particular group of people. During hospitalization, sleep

disturbances is a common phenomena among this group population. From recorded data, there were 894 patients who are 60 years and above admitted to the six wards (2 Intan, 3 Utara, 4 Utara, 4 Selatan, 7 Utara & 7 Selatan) in Hospital Universiti Sains Malaysia in the past three months, since June till August of 2012 (Unit Rekod Perubatan Hospital Universiti Sains Malaysia, 2012) .

Sleep and ageing

Sleep is vital components in one's daily living. Sleep is defined by a simple behavioral definition as a reversible behavioral state of perceptual disengagement from and unresponsiveness to the environment (Carskadon and Dement, 2000). According to Hoffman (2003) normal sleep cycle comprised of two components which are non-rapid eye movement (NREM) sleep and rapid eye movement (REM) sleep. NREM consists of 4 stages, beginning with Stage 1, characterized by the transitional period of drifting one to sleep when he/she can be aroused easily; Stage 2, characterized by a relaxation state where one having light sleep; and Stage 3 and 4 are stages where sleep progressively deeper and become more restorative period as one's pulse, blood pressure and metabolism become slow. Roland (2011) stated that both of stages 3 and 4 play an important role as there will be healing process that take place, brain and body tissue repaired and chemical necessary for proper functioning are replenished.

Apart of NREM and its 4 stages, REM sleep is a state where the body reaches the deepest level of relaxation, sometimes also known as paradoxical sleep as there were electroencephalographic activities similar to the pattern seen during wakefulness. In this state, the respiratory rate, heart rate, and blood pressure become highly variable, irregular

and frequently elevated. Nevertheless, profound muscle relaxation occurs in this state. Besides, REM also characterized by active sleep in which dream occur. (Hoffman, 2003). In addition, Roland, 2011 characterized this stage as where brain activation and muscle paralysis happen and known as the phase where procession of memory occur. Therefore, less amount of REM may results to poor recalling memory or recently learned information. Hoffman also added that normal sleep cycle commonly ordered by NREM Stage 1 followed by Stage 2, 3 and 4 but with possible drifting back through previous stages, to Stage 3 and 2 before REM started and this cycle last long usually in about 90 minutes and continue to repeats itself throughout one's full night's sleep.

Change to sleep patterns is part of the normal aging process. Harbison (2002) stated that older people need approximately 30 to 60 minutes less per night compared to sleep of young person. Harbison also added that sleep in older people tend to be lighter with a reduced proportion of Stage 3 and 4 in NREM whilst REM sleep is preserved throughout life. In other study by Ancoli-Isreal, Ayalon and Salzman (2008) found that changes in circadian rhythm plays a great role in the sleep pattern as one getting older. As the circadian rhythm serves as a 24 hour biological rhythm which is responsible to control many physiological functions in human's body especially in sleep and wake cycle, a change in it of course will affect one's normal sleep pattern. With age, the sleep and wake circadian rhythm becomes weaker and less coordinated, result in less consistent period of sleep and wake.

1.2 Problem Statement

Sleep disturbances can lead to unhealthy event of an individual. This statement was supported by Gay (2010). When sleep is restricted, undesirable neuro-behavioral and physiologic changes may occur. Experimental and epidemiologic studies of sleep-deprived healthy subjects found the adverse effects of sleep disturbances on metabolic and endocrine functions, immune responses and cardiovascular effects, indicating for its potential in contributing the serious complications of one's health. Thus, for those who has already become ill and require hospitalization, it is understandable that they are more exposed to the complications when their sleep was disturbed. Besides, Sargazi, Salehi and Naji (2012) stated that sleep disturbances significantly influence the individuals' quality of life as they may negatively affect the physical, emotional and social aspects of one's daily functions.

There are several characteristics of sleep disturbances. Gay (2010) stated that sleep disturbance can be either completed or partial with respect to total sleep time, sleep stage, or degree of fragmentation. Foley, Monjan, Brown, Simonsick, Wallace, and Blazer (1995) characterized sleep disturbances as difficulty of falling asleep, difficulty maintaining asleep, early morning awakening and excessive daytime sleepiness. This statement was also supported by Hoffman (2003) in a study by saying that sleep disturbances usually reported by patient as difficulty falling asleep (sleep latency), difficulty staying asleep (sleep efficiency), early morning awakening or not feeling refreshed after sleeping. In other study, sleep disturbances had been characterized as difficulty in going to sleep, disintegration of sleep, short duration of sleep, low quality of sleep and drowsiness during daytime (Sargazi *et al.*, 2012). Bourne, Minelli, Mills and

Kandler (2007) stated that when one's sleep was disturbed, the sleep cycle is disrupted with a dominance of Stage 1 and 2 NREM sleep and reduced deeper phases of REM sleep.

The nursing literature stated that the causes of sleep disturbances can be categorized into 3 main groups, including environmental, physiological, and psychological, all of which have a variety of interventions that can be done to promote better sleep (Gay, 2010). This statement also was supported by Frighetto, Marra, Bandali, Wilbur, Naumann and Jewesson (2004). They suggested that in hospitalized patients, the most common causes of acute insomnia include the effects of illness, environmental sleep disruption, medication, anxiety, and depression. However, according to Hodgson's study, the degree of sleep disruptions and its influence on a person sleep pattern is very personal and individualize (Lee, Low & Sheila Twinn, 2008).

A literature state that although sleep disturbance is a common complaint among patients of all ages, research suggests that the elderly are more exposed to this problem (Roepke & Ancoli-Israel, 2010). Since the elderly have the highest rate of incidence of hospitalization (38%), and the longest duration of stay in hospitals (45%), they experience the highest level of sleep problem (Sargazi *et al.*, 2012). By involving large study of over 9,000 older adults age of 65 years old and above, 42% of participants reported difficulty initiating and maintaining sleep (Roepke & Ancoli-Israel, 2010). Roepke and Ancoli-Israel also added, although changes in sleep pattern are to be expected with increasing age, age by itself does not result in the disturbances. They suggested in older people, the ability to sleep decreases often as a result of the other factors associated with aging.

The numbers of elderly being hospitalized were expected to be increased significantly as the population ages. Targeting the care needs of elderly during hospitalization and awareness regarding the risk for unhealthy event may result from the disturbances, therefore this study is purposely conducted. As the contributing factors of an event known, appropriate action could be taken to minimize the occurrence. Thus, this study was conducted to determine the factors affecting sleep disturbances among geriatric patient during hospitalization in Hospital Universiti Sains Malaysia, Kubang Kerian, Kelantan.

As guideline, the Spielman's Three-Factor Model was used to conduct this study. This model proposed the interaction between predisposing, precipitating, and perpetuating factors in the development and continuation of sleep disturbances (Matthews, 2011).

1.3 Research Objectives

The general objective for this study is to determine the factors affecting sleep disturbances among geriatric patients during hospitalization in Hospital Universiti Sains Malaysia, Kubang Kerian, Kelantan

1.3.1 Specific Objectives

- i. To determine the prevalence of sleep disturbances among hospitalized geriatric patients in Hospital Universiti Sains Malaysia
- ii. To determine the relationship between selected socio-demographic data (age, sex, marital status, duration of hospitalization, health problem and history of hospitalization) with sleep disturbances among geriatric patients during hospitalization in Hospital Universiti Sains Malaysia
- iii. To determine the relationship between environmental factors of noise, lighting, nursing interventions and weather with sleep disturbances among geriatric patients during hospitalization in Hospital Universiti Sains Malaysia
- iv. To determine the relationship between psychological factors of anxiety and depression with sleep disturbances among geriatric patients during hospitalization in Hospital Universiti Sains Malaysia

- v. To determine the relationship between physiological factor of pain with sleep disturbances among geriatric patients during hospitalization in Hospital Universiti Sains Malaysia
- vi. To determine the relationship between sleep disturbances with degree of daytime sleepiness among geriatric patients during hospitalization in Hospital Universiti Sains Malaysia

1.4 Research Questions

1. What is the prevalence of sleep disturbances in hospitalized geriatric patients in Hospital Universiti Sains Malaysia?
2. Is there any relationship between selected socio-demographic data (age, sex, marital status, duration of hospitalization, health problem and history of hospitalization) with sleep disturbances among hospitalized geriatric patients in Hospital Universiti Sains Malaysia?
3. Is there any relationship between environmental factors of noise, lighting, nursing interventions and weather with sleep disturbances among geriatric patients during hospitalization in Hospital Universiti Sains Malaysia?

4. Is there any relationship between psychological factors of anxiety and depression with sleep disturbances among geriatric patients during hospitalization in Hospital Universiti Sains Malaysia?
5. Is there any relationship between physiological factor of pain with sleep disturbances among geriatric patients during hospitalization in Hospital Universiti Sains Malaysia?
6. Is there any relationship between sleep disturbances and degree of daytime sleepiness among geriatric patients during hospitalization in Hospital Universiti Sains Malaysia?

1.5 Hypotheses

1. Null hypothesis, H_0 : There is no significant relationship between selected socio-demographic data (age, sex, marital status, duration of hospitalization, health problem and history of hospitalization) with sleep disturbances among geriatric patients during hospitalization in Hospital Universiti Sains Malaysia
Alternate hypothesis, H_A : There is a significant relationship between selected socio-demographic data (age, sex, and marital status, duration of hospitalization, health problem and history of hospitalization) with sleep disturbances among geriatric patients during hospitalization in Hospital Universiti Sains Malaysia

2. Null hypothesis, H_0 : There is no significant relationship between environmental factors of noise, lighting, nursing interventions and weather with sleep disturbances among geriatric patients during hospitalization in Hospital Universiti Sains Malaysia

Alternate hypothesis, H_A : There is a significant relationship between environmental factors of noise, lighting, nursing interventions and weather with sleep disturbances among geriatric patients during hospitalization in Hospital Universiti Sains Malaysia

3. Null hypothesis, H_0 : There is no significant relationship between psychological factors of anxiety and depression with sleep disturbances among geriatric patients during hospitalization in Hospital Universiti Sains Malaysia

Alternate hypothesis, H_A : There is a significant relationship between psychological factors of anxiety and depression with sleep disturbances among geriatric patients during hospitalization in Hospital Universiti Sains Malaysia

4. Null hypothesis, H_0 : There is no significant relationship between physiological factor of pain with sleep disturbances among geriatric patients during hospitalization in Hospital Universiti Sains Malaysia

Alternate hypothesis, H_A : There is a significant relationship between physiological factor of pain with sleep disturbances among geriatric patients during hospitalization in Hospital Universiti Sains Malaysia

5. Null hypothesis, H_0 : There is no significant relationship between sleep disturbances and degree of daytime sleepiness among geriatric patients during hospitalization in Hospital Universiti Sains Malaysia

Alternate hypothesis, H_A : There is a significant relationship between sleep disturbances and degree of daytime sleepiness among geriatric patients during hospitalization in Hospital Universiti Sains Malaysia

1.6 Definitions of Terms

1.6.1 Sleep disturbances

Sleep disturbance is defined as the perceived or actual alterations in nighttime sleep (both quantity and quality) with subsequent daytime impairment (Matthews, 2011). Common complaints include difficulty in one or more of these areas: falling asleep, staying asleep, early morning awakenings with inability to resume sleep, non-restorative sleep, and excessive daytime sleepiness.

1.6.2 Geriatric

According to the United Nations World Assembly on Ageing held in Vienna, 1982, geriatric or elderly is defined as people who aged 60 years and above (Ong, 2001). This definition is accepted in Malaysia till now even the retirement age of 58-60 seems to suggest that the threshold to ageing begins at 58-60 years of age.

1.7 Significance of the Study

Locally, there were lacks of study done in the past regarding sleep disturbances among hospitalized geriatric patients. Thus, this study is significant in order to provide information regarding sleep disturbances among elderly patients during hospitalization in local setting. It is wise to investigate more on factors that contributed for sleep disturbances among geriatric patients so that appropriate interventions can be implemented to minimize the occurrence. This study provides knowledge and awareness toward the nurses regarding the importance of assessment and care of sleep among geriatric during hospitalization. With this knowledge and awareness, nurses may enhance their quality of care on the patients and thus prevent further complications or unhealthy event may result from the disturbances.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

According to the United Nations (UN) Population Division 2012, the number of people over 60 years old and above are approximately 810 million persons and this number is expected to grow to more than 2 billion by 2050. In the other word, UN state that one out of every nine persons in the world aged 60 years old and above and by 2050, one out of every five persons is projected to be in that particular age group. In this world population, Asia has more than half (55%) of the world's older persons and followed by Europe, which accounts for 21%.

Normal physiological, physical and psychological changes in older person make this population vulnerable to the illness and prone to being hospitalized. According to a study done by Missildine, Bergstrom, Meininger, Richards and Foreman (2010), it was reported that normal older adults have an earlier bedtime and wake-up time than younger adults, but this usual routine may have been disrupted by illness and hospitalization. As the elderly population keeps increases, more attention needs to be given especially by health care providers in order to ensure the problem like sleep disturbances could be avoided during hospitalization.

2.2 Review of Literature

2.2.1 Prevalence of sleep disturbances among elderly during hospitalization

According to Messildine *et. al* (2010) , hospitalizations of persons aged 65 years old and above has escalated in the United States over the past 4 decades. In 1970, 20% of all inpatients were aged 65 years old and above, with the number rising to 38% percent by 2006; and sleep complaints are common in that particular group of people at both home and during hospitalization. In other study by Hoffman (2003) stated that from self-reported sleep disturbance among hospitalized patients, many of whom are elderly, can range from 22% to 61%. Other than that, Isaia, Corsinovi, Bo, Santos-Pereira, Michelis, Aimonino, and Zanolchi (2011) reported that when 218 hospitalized elderly patients were investigated for the presence of sleep disorders during study period, eighty of them were referred sleep disorders with a prevalence of 36.7% while seventeen showed a new onset of sleep problem.

Acute illness or injury and the Intensive Care Unit (ICU) environment increase the occurrence of sleep disturbances. According to Matthews (2011) in a large study of medical and surgical ICU patients (n = 1,625), 38% of them experienced difficulty falling asleep whilst 61% reported greater need for sleep than usual. Matthews added that more than half of all ICU days are attributable to patients whose aged older than 65 years old. Generally, older adults have prolonged sleep latency, shorter total sleep time, reduced sleep efficiency, and more awakenings. In addition to factors contributing to sleep disturbance in younger ICU patients, sleep of older adults may be even further disrupted by the physiological processes of aging.

2.2.2 Association of socio-demographic data with sleep disturbances

There are many studies done to determine the association of socio-demographic data with sleep disturbances. Apart from the results show that women are more vulnerable towards sleep disturbances than men. This finding was supported by Orwelius, Nordlund, Nordlund, Edéll-Gustafsson, and Sjöberg (2008) in a study aimed to determine prevalence of sleep disturbances and its relation to the patient's reported health-related quality of life after intensive care. Result from the study found that like those in the study group, women in the reference group also reported more sleep disturbances than men (19% and 16%, respectively). Furthermore, the finding of women with high risk for sleep disturbances also reported in a Swedish population, previously confirmed by Fahlen and colleagues in their study finding. Result show 23% of the women were affected by sleep disturbances compared with only 14% reported of men (Fahlén, Knutsson, Peter, Åkerstedt, Maria Nordin, Alfredsson, & Westerholm, 2006). However, in a study done by Messildine *et al.* (2010), it is reported that women sleep longer than men but spend less time in slow-wave delta sleep, the stage of sleep thought to be the most vulnerable to environmental disturbances. As a consequence, women have low risk for sleep disturbances.

In other review, a significant association was found between sleep disturbances and quality of perceived social support. In a study conducted by Costa, Ceolim and Neri (2011), it was reported that there is a significant relationship between the influence of social support and the sleep quality among older adults. The study found that most of older adults who have good family relationships and play a role in society, also among friends, have better quality of sleep. It is believed that the social support and network

may facilitate one's ability to cope with mental and physical health problems. In addition, Park, Cho, Chang, Bae, Jeon, Cho, Kim, Chung, Ahn, Lee and Hong (2010) found that people who are windowed / divorced / separated are significantly more having sleep disturbances compared to married people. This finding also was supported by Troxel, Buysse, Halls and Matthews (2009) and Arber (2012).

2.2.3 Factors affecting sleep disturbances among geriatric patient during hospitalization

According to Messildine *et. al* (2010), by nature of their 24-hour-care provision roles, hospitals are particularly prone to sleep disturbances because of noise and light. This statement was also supported by Isaia *et al.* (2011) as they were saying that hospital ward exposes patients to many disturbing factors especially the noise that may originating from other patients or visitors, increased light exposure, unfamiliar bed and night-time nursing. The study reported the most sleep disturbing factors among hospitalized geriatric patient are other patients' noise, alarms, cough, visitors' noise and nurses' noise as 35%, 18%, 16.2%, 15% and 7% respectively. Also, added by Messildine and colleagues, sleep of the hospitalized elders was often disturbed on the first night of hospitalization. The study found that sleep efficiency of the sample (46%, $n = 48$) was less than the usual 79% efficiency for a 70 year old, possibly related to the "first night effect" of sleeping in a different environment.

Conversely, a study by Foley, Ancoli-Israel, Britz and Walsh (2004) found that sleep complaints were common in older adults secondary to their comorbidities. This

finding also was supported by the finding of another study done by Orwelius *et al.* (2008) as they found that concurrent disease had more effect on the sleep patterns than any other factor. The result from the study shows that in Intensive Care Unit (ICU), concurrent disease was strongly associated with two complaints of sleep disturbances which included difficulties in falling asleep and poor sleep quality. For other ICU related factors such as mechanical ventilation, result in that study shown no significant influence on sleep disturbances. Furthermore, Matthews (2011) also stated that diseases are the main causes of sleep disturbances in severe ill patients. The study found that diseases like respiratory, endocrine, renal, cardiovascular, infectious, and neurological diseases have been associated with many symptoms that interfere with onset and maintenance of sleep. However, in another previous study done by Orwelius *et al.* (2008), they found that mental health such as anxiety and depression; and bodily pain are the only correlations of all three aspects of sleep disturbances which are include the difficulty in falling asleep, poor quality of sleep and sleep deficit.

2.2.4 Sleep disturbances lead to daytime sleepiness and other effects.

Increasing in age is always seen as risk factors that responsible for the decrement of one's health-related quality of life. Many studies found that sleep disturbances also may impact one's quality of life especially in elderly people. In a study by Matthews (2011) found that patients often complain of fatigue after having disrupted sleep. Sleep disturbances may lead to symptoms of excessive daytime sleepiness and diminished energy. This statement also was supported by Hoffman (2003) and Pagel (2009) as sleep

loss often contributing to daytime impairments. Pagel stated that the prevalence of excessive daytime sleepiness higher in adolescent, older adult and shift workers. Seriously compromised total sleep time can predispose the elder to depression, and daytime sleepiness has been found to be a risk or precipitating factor in the development of cardiovascular disease and has been associated with higher rates of mortality.(Hoffman, 2003).

In a Japanese study conducted by Manabe, Matsui, Yamaya, Sato Nakagawa, Okamura, Arai and Sasak (2000), sleep disturbances were studied as a mortality risk. In 272 geriatric patients of a skilled-care geriatric hospital, the occurrence of sleep disturbances were assessed by hourly observations of patients over 2 weeks as baseline, and they were prospectively follow up for 2 years to assess mortality. After 2 years, the results show significantly higher in mortality of the groups with nighttime insomnia, daytime sleepiness and sleep-onset delay. Increased risk for mortality also was found in Messildine and colleagues' study (2010).

There were studies found that sleep disturbances during hospitalization may also contribute for chronic sleep problem after discharge. This statement proved by Matthews's study by showing that several months after hospital discharge, more than half of ICU survivors (n =39) continued to experience worse interrupted sleep or altered sleep patterns compared with their pre-hospital patterns. The finding was also supported by another study conducted by Orwelius *et al.* (2008). They found that up to 38% of study sample affected by sleep disturbances and without improvement at 12 months after discharge from the ICU and from the hospital. The result of study group shown had more difficulty in falling asleep, had poorer quality of sleep and slept for shorter periods than

the reference group (38% versus 13%, 20% versus 12% and 61% versus 55%, respectively).

2.3 Theoretical / Conceptual Framework

Three-Factor Model or also known as “3P model” was developed by Dr. Arthur J. Spielman in 1987. The model proposed the interactions among predisposing, precipitating, and perpetuating factors of insomnia. By including both stress and behavioral factors, Spielman used the model to describe how individual differences cause initiation of acute disturbances in sleep that become chronic. Spielman stated that people with insomnia have predisposing factors (traits), when combined with precipitating factors like life stress, lead to chronic insomnia if there are maladaptive coping strategies (behaviors used to compensate for the loss of sleep), as perpetuating factors. (Spielman, Caruso & Glovinsky, 1987). This model was commonly used by past researchers in their study regarding insomnia and sleep disturbances. The past researchers include McCurry and colleagues who were conducted their study in 2007 entitled “Sleep disturbances in caregivers of person with dementia: contributing factors and treatment implications” and Matthews with her study conducted in 2011 entitled “Sleep disturbances and fatigue in critically ill patients”. In this study, the conceptual framework used was adapted by the researcher based on these two literatures.

Matthews (2011) defined predisposing factors as individual physiological and psychological traits that affect the likelihood of developing sleep problems. The predisposing factors are independent risk factors which are including ageing process and female gender. Both of these factors are believed to be responsible for the disruption in

normal sleep of hospitalized geriatric patient. Prevalence show most of geriatric patients are at high risk for age-related sleep disturbances. These disturbances always characterized by increased sleep latency, decreased sleep maintenance, decreased slow wave and REM sleep, more frequent shifts between sleep stages, and circadian rhythm disturbances and particularly advanced sleep phase (McCurry, Logsdon, Teri & Vitiello, 2007)

Following Spielman's Three Factor Model, sleep disturbances will occur when a person who is predisposed to disrupted sleep encounters some event that precipitates nighttime wakefulness (McCurry *et al.*, 2007). Matthews defined precipitating factors as the triggers that bring about or worsen sleep disturbances. For hospitalized geriatric patient, the precipitating events are often happened in the nighttime routines. In this study, the precipitating factors may include the environmental, physiological and psychological factors. Presence of pain due to illness or feeling fear and anxiety towards new environment or treatment may result in sleep disruptive. In such non-conducive environment, excessive light and noise added with nurses' duty may result in increase awakened of hospitalized geriatric patient. For this vulnerable group, it can be very difficult to turn sleep back after being awakened at night.

Due to daytime sleepiness result from sleep loss during nighttime, one often start daytime napping or spending longer hours in bed trying to catch up on lost sleep. According the Three Factor Model, such action will become the perpetuating factors which can cause further decrement in their nightly sleep quality and quantity (McCurry *et al.*, 2007). Thus, although hospitalization factors in the beginning precipitate geriatric patient awakenings, the perpetuating event will responsible for further patient disrupted

sleep patterns even after the factors were no longer present. As the consequences, sleep disturbances which initially start as a result from hospitalization factors, it may become the chronic disturbances for the geriatric patient if it was not prevented.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Research Design

A cross-sectional design was used by researcher to conduct this study. In this study design, status of respondents with respect to the presence and absence of both factors contributing and sleep disturbances are assessed at the same point in time.

3.2 Population and Setting

In this study, the target population were geriatric patients, aged 60 years old and above. The selected settings are surgical and medical wards; 2 Intan (male surgical ward), 3 Utara (female surgical ward), 4 Utara (female orthopedic ward), 4 Selatan (male orthopedic), 7 Utara (general medical female ward) and 7 Selatan (general medical male ward).

3.3 Sampling Plan

3.3.1 Sample

The sample involved in this study were hospitalized geriatric patients whose aged were 60 years old and above and were admitted to the selected medical or surgical wards in Hospital Universiti Sains Malaysia, Kubang Kerian, Kelantan

3.3.2 Sampling Method

In this study, purposive sampling method was used to select the study sample. As in research study, inclusion criteria, along with exclusion criteria, make up the selection or eligibility criteria used to rule in or out the target population.

Inclusion criteria:

- Geriatric patient who are 60 years old and above
- Both female and male
- Admitted to the medical or surgical wards: 2 Intan, 3 Utara, 4 Utara, 4 Selatan, 7 Utara and 7 Selatan for more than 24 hours
- Able to understand Bahasa Melayu
- Able to provide informed consent to participate in the study

Exclusion criteria:

- Altered consciousness patient

- Critical ill patient
- Unwilling to participate in the study

3.3.3 Sample Size

In this study, the number of sample size was calculated using Raosoft formula. The average population of geriatric patients, aged 60 years old and above and admitted to 7 Utara, 7 Selatan, 4 Utara, 4 Selatan, 2 Intan and 3 Utara since June till August 2012, obtained from the Unit Rekod Perubatan Hospital Universiti Sains Malaysia was inserted to the formula. As the population size in that particular three months are 894, the average population will become 298. As the result, the number of sample size obtained by using the formula was 169. Then, by considering 10% drop out the number of sample size was ranged from 152 to 186.

3.4 Variables

In this study, there are several variables involved in order to determine the relationship. To determine the relationship between selected socio-demographic data (age, sex, and marital status, duration of hospitalization, health problem and history of hospitalization) and factors (environmental (noise, lighting, nursing interventions, weather), psychological (anxiety and depression) and physiological (pain) aspect) with sleep disturbances among geriatric patients during hospitalization in Hospital Universiti Sains Malaysia, the selected socio-demographic data and the factors become the independent variable whilst sleep disturbances as the dependent variable. To determine