

**A STUDY ON ASSOCIATION BETWEEN
SLEEP QUALITY AND DEPRESSION AMONG ELDERLY
IN ASSISTED LIVING FACILITIES**

By

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ABSTRACT

BACKGROUND: The ageing population is increasing rapidly in Malaysia and issues on maintaining wellbeing of elderly could be foreseen. The prevalence of poor sleep quality among elderly is high in assisted living facilities, which will lead to increased depression risks. Therefore, there is a need to address the importance of good sleep quality among elderly to improve their life quality.

OBJECTIVES: To determine the association between sleep quality and selected sociodemographic and to determine the association between sleep quality and depression among elderly in assisted living facilities.

METHODOLOGY: A non-experimental quantitative descriptive, correlational study has been conducted in 13 assisted living facilities within Klang Valley, Malaysia. A total of 274 elderly aged 60 years and above were assisted by researchers to complete the questionnaire. 3 sections were included in the questionnaire, which were sociodemographic questionnaire, Pittsburgh Sleep Quality Index (PSQI) to determine the sleep quality and Geriatric Depression Scale (GDS) - Short Form to assess for depression. The data was analysed using descriptive statistics and inferential statistics (Chi-square test and Pearson correlation test).

RESULTS: Out of 274 participants, there were 179 (65.3%) participants had poor sleep quality and 85 (31%) participants had depression. No association was

detected between sleep quality and selected sociodemographic ($p>0.05$). The prevalence of depression among elderly with poor sleep quality was 41.3%.

CONCLUSION: This research study showed significant association between sleep quality and depression among elderly in assisted living facilities ($p<0.001$). Interventions to promote sleep quality and psychological wellbeing are recommended to improve the quality of life among elderly.

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PERMISSION SHEET

It is hereby certified that **SHIERLY YAP SIONG WAN** (ID No: 15UMB05411) has completed this Research project entitled “A STUDY ON ASSOCIATION BETWEEN SLEEP QUALITY AND DEPRESSION AMONG ELDERLY IN ASSISTED LIVING FACILITIES” under the supervision of Ms. Liew Siew Fun (Supervisor) and Ms. Sheela Devi a/p Sukuru (Co-Supervisor) from the Department of Nursing, Faculty of Medicine and Health Sciences.

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Yours truly,

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DECLARATION

I hereby declare that the Research project is based on my original work except for quotations and citations which have been duly acknowledge. I also declare that it has not been previously or concurrently submitted for any other degree at UTAR or other institutions.

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Date: 19 September 2018

APPROVAL SHEET

This Research project entitled **“A STUDY ON ASSOCIATION BETWEEN SLEEP QUALITY AND DEPRESSION AMONG ELDERLY IN ASSISTED LIVING FACILITIES”** is prepared by SHIERLY YAP SIONG WAN and submitted as partial fulfilment of the requirements for the degree of Bachelor of Nursing (Hons) at Universiti Tunku Abdul Rahman.

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GLOSSARY TERMS

No.	Abbreviation / Glossary Term	Meaning
1.	APA	American Psychological Association
2.	CDC	Centers for Disease Control and Prevention
3.	GDS	Geriatric Depression Scale
4.	PSQI	Pittsburgh Sleep Quality Index
5.	WHO	World Health Organisation

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CHAPTER ONE

INTRODUCTION

CHAPTER ONE: INTRODUCTION

1.0. CHAPTER OVERVIEW

In this chapter, background of the study, problem statement, general and specific objectives along with research questions, hypothesis, operational definitions and significance of the study will be specifically explained in detail.

1.1. BACKGROUND

According to WHO South-East Asia (2017), elderly are those who are 60 years old and above. The population in this global is ageing rapidly and the aged population is expected to be doubled, from 962 million to 2.1 billion from 2017-2050 (United Nations Department of Economic and Social Affairs, 2017). It was estimated that Malaysia will follow the same direction to be an ageing nation with elderly population increasing from 2.8 million (9%) in 2015 to 5.6 million (15%) by 2035 (Daim, 2016).

As the proportion of elderly rises, issues on maintaining health and well-being of the elderly could be foreseen. Sleep is one of the physiological needs in Maslow's hierarchy that are essential for basic survival for all. Quality of sleep can be categorised as either good or poor. Magnavita and Garbarino (2017) and McLeod (2017) revealed that good quality of sleep is a vital component for maintaining health and overall well-being. National Sleep Foundation (2017) stated that the significant features of good sleep quality are falling asleep in ≤ 30 minutes, sleeping efficiency at $\geq 85\%$, never get up more than once every night and being

awake not longer than 20 minutes after falling to sleep initially. CDC (2017) described feeling tired even after having sufficient sleep, waking up repeatedly in the night and symptoms of sleep disorders such as snoring, restless legs and excessive daytime sleepiness are experiences of poor sleep quality.

People often complained of trouble to fall and stay asleep as they age (National Sleep Foundation, 2018). Sleep problems arise as critical issues among the ageing populations and it was found by Razali, et al. (2012) that 13% - 55% of elderly worldwide experienced poor sleep quality. In Malaysia, 76.8% of elderly living in old's folk home had poor sleep quality and and this has been known to affect an individual physically, mentally and also emotionally (Rashid, Ong and Wong, 2012). On the other hand, depression is another common disorder among elderly in global (Liu, et al., 2017). The study conducted by Shahar, et al. (2011) detected that there is no exception in Malaysia with 71.8% of the prevalence of depression found among institutionalized elderly.

Yu, et al. (2016) addressed that there are significant implications of sleep on elderly mental wellbeing. Association was found between poor sleep quality and depression but the association remains complex and not thoroughly understood (CDC, 2013; Chang, et al., 2014). In Turkey, the prevalence of depression among elderly with self-reported poor sleep quality was 60.3% (Orhan, et al., 2012). Another study carried out by Bao, et al. (2017) discovered 39.6% of the prevalence of depression among elderly with poor sleep quality in China. APA (2017) and CDC (2013) highlighted that depression increases both the morbidity and mortality

rates. Therefore, this matter should be taken seriously and more investigations about the association between sleep quality and depression have to be done in order to improve the quality of life among elderly.

1.2. PROBLEM STATEMENT

Poor sleep quality among elderly is prevalent in most countries and it was also found to be similar among elderly staying in institutions in Malaysia (Azri, et al., 2016). The importance of enhancing quality of life among elderly has been long acknowledged by the Malaysian government and community. Nevertheless, there is still lack of social awareness on the significance of meeting the basic physiological needs of the elderly, which is sleep. Deficiencies in quality of sleep have shown to have a negative effect to the mental wellbeing, which can lead to depression.

Sleep problems and depression among elderly that are often being under-recognized and under-diagnosed (Crowley, 2011). Li, et al. (2014) and Paudel, et al. (2013) indicated that both can cause significant health problems such as increasing psychiatric and medical comorbidity, disability and also mortality risks, thus reducing the quality of life of elderly. More manpower and higher costs are needed to treat and care for the elderly with either of the problems and its harmful consequences, inducing stress to the caregivers and leaving great impact on a country's economy (Center for Workplace Mental Health, 2017). Bao, et al. (2017) and Morin and Benca (2012) supported these lead to the increase in health and

public burdens. This emphasizes on the importance of detecting sleeping problems and depression among elderly in assisted living facilities. Hence, timely interventions to improve sleep quality and psychological wellbeing among elderly could be planned and implemented.

The risk of developing depression was reported to be higher among the elderly with poor sleep quality (Bao, et al., 2017). Realistically, the understanding of association between sleep quality and depression among elderly is still lacking (Bao, et al., 2017; CDC, 2013; Chang, et al., 2014; Shahar, et al., 2011; Yu, et al., 2016). In Malaysia, association was found between poor sleep quality and depression among elderly in primary care centre (Razali, et al., 2016). However, no study has been done to discover the association in assisted living facilities in Malaysia until present. Therefore, there is a need for investigation to fill in the research gap.

1.3. RESEARCH OBJECTIVE

1.3.1. GENERAL OBJECTIVE

To determine the association between sleep quality and depression among elderly in assisted living facilities.

1.3.2. SPECIFIC OBJECTIVES

- 1) To determine the sleep quality status among elderly in assisted living facilities.

- 2) To determine the depression status among elderly in assisted living facilities.
- 3) To determine the association between sleep quality and selected sociodemographic variables (age, gender, marital status, educational level and length of stay) among elderly in assisted living facilities.
- 4) To determine the association between sleep quality and depression among elderly in assisted living facilities.

1.4. RESEARCH QUESTIONS

- 1) What is the sleep quality status among elderly in assisted living facilities?
- 2) What is the depression status among elderly in assisted living facilities?
- 3) Is there any association between sleep quality and selected sociodemographic variables among elderly in assisted living facilities?
- 4) Is there any association between sleep quality and depression among elderly in assisted living facilities?

1.5. HYPOTHESIS

1.5.1. NULL HYPOTHESIS

H₀₁: There will be no significant association between sleep quality and selected sociodemographic variables among elderly in assisted living facilities.

H₀₂: There will be no significant association between sleep quality and depression among elderly in assisted living facilities.

1.5.2. ALTERNATIVE HYPOTHESIS

H_{A1}: There will be significant association between sleep quality and selected sociodemographic variables among elderly in assisted living facilities.

H_{A2}: There will be significant association between sleep quality and depression among elderly in assisted living facilities.

1.6. OPERATIONAL DEFINITIONS

1.6.1. CONCEPTUAL DEFINITION

1.6.1.1. STUDY

Gaining knowledge with time and attention devoted.

1.6.1.2. ASSOCIATION

Connection or linkage between things.

1.6.1.3. SLEEP QUALITY

The degree of excellence of sleep.

1.6.1.4. DEPRESSION

Mental illness characterized by feelings of sadness and hopelessness.

1.6.1.5. ELDERLY

People with old age (≥ 60 years old)

1.6.1.6. ASSISTED LIVING FACILITIES

Places where help is provided for living.

1.6.2. OPERATIONAL DEFINITION

1.6.2.1. STUDY

A detailed investigation and analysis of subject of interest

1.6.2.2. ASSOCIATION

Correlation or binding factor that relate one variable to another variable (Jones, 2008)

1.6.2.3. SLEEP QUALITY

Quality of sleep is categorised into good and poor following the PSQI measurement of 7 components, namely, subjective sleep quality (self-rated sleep quality), sleep latency (time taken to fall asleep), sleep duration (total sleep hours), habitual sleep efficiency (percent of time asleep in bed), sleep disturbances, use of sleeping medications and daytime dysfunction (Spira, et al., 2011).

1.6.2.4. DEPRESSION

Common preventable and treatable mental illness which manifested by constant feeling of sadness and loss of interest engaging in daily life activities that affects one to function normally (WHO, 2017).

1.6.2.5. ELDERLY

Older adults who aged 60 years old and above and the candidates of this study (WHO South-East Asia, 2017)

1.6.2.6. ASSISTED LIVING FACILITIES

Housing provided for elderly who require some assistance in activities of daily living but not the intensive care in nursing home (National Institute of Aging, 2017).

1.7. SIGNIFICANCE OF THE STUDY

This study will give better understanding of the association between sleep quality and depression among elderly in assisted living facilities within Klang Valley in Malaysia. The outcome of this study may serve as evidence-based information for future study on relevant issue and may be disseminated to residents, caretakers and Malaysian society to raise awareness on the importance of having good sleep quality as a substantial effort in enhancing the quality of life among elderly. Furthermore, nurses may use the findings as guidelines to develop prevention and also implement appropriate interventions to improve sleep quality among elderly which may have direct or indirect effect on depression. The significance of giving health education on sleep quality and psychological wellbeing among elderly may also be stressed on. Lastly, the results may emphasize the necessities for proper assessments to identify sleep problems and mental illness among elderly and initiate early treatment to prevent the development of serious complications, improve the health and overall wellbeing of elderly as well as to increase their quality of life.

1.8. SUMMARY

The background information related to topic study, problem statement and significance of study were described in this chapter. The researcher is likely to examine the association between sleep quality and depression among elderly in

assisted living facilities. In the next chapter, literature reviews that support the study will be discussed.

CHAPTER TWO

LITERATURE REVIEW

CHAPTER TWO: LITERATURE REVIEW

2.0. CHAPTER OVERVIEW

In this chapter, details on search strategy, review of literature and conceptual framework adopted will be explained.

2.1. SEARCH STRATEGY

The literature search was done in November 2017 through a number of electronic databases for the purpose of locating published research paper. The databases that were searched were Science Direct and PudMed. Boolean Operators such as AND, OR were applied to specify the search and keywords utilized were sleep quality, sleep disturbance, depression, elderly, older adults and assisted living facilities. A Google scholar search was also conducted to identify other relevant documents or reports relevant to the study.

434 articles from Google Scholar, 1823 articles from Science Direct and 80 articles from PubMed, which were from 2011 till 2018, were able to be retrieved and only English articles were taken. The number of articles were narrowed down to 15 after being screened for irrelevancy of topics related to medical illness, duplications and irrelevancy of contents to researcher's topic. The literature search strategy can be seen in Diagram 2.1.

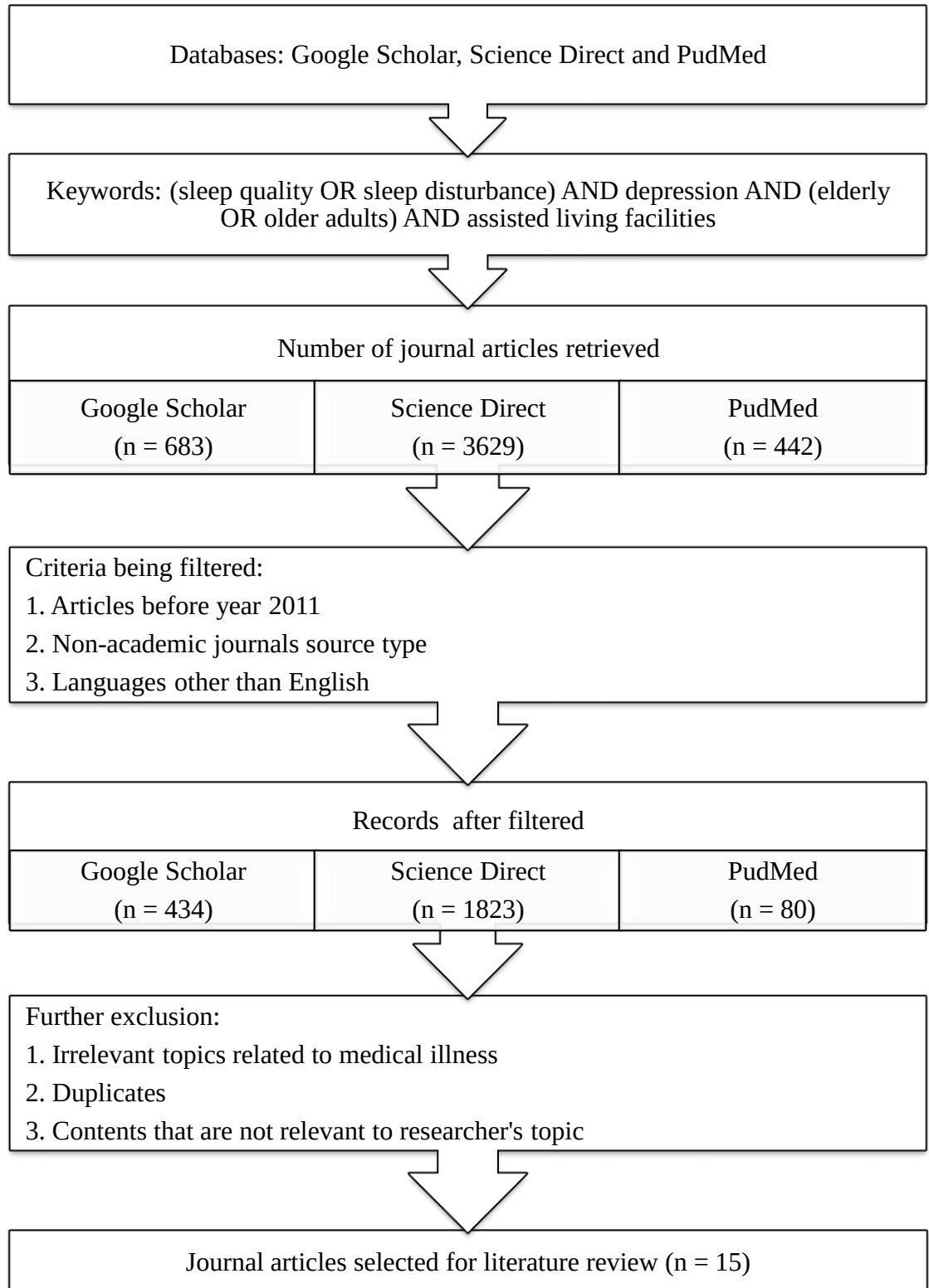


Diagram 2.1: Literature search strategy

2.2. REVIEW OF LITERATURE

In this literature review, the 1) sleep quality status among elderly; 2) depression status among elderly; 3) sleep quality and sociodemographic variables; 4) sleep quality and depression among elderly will be discussed.

2.2.1. SLEEP QUALITY STATUS AMONG ELDERLY GLOBALLY AND IN MALAYSIA

Several previous studies on sleep quality among the elderly have been done globally and in Malaysia. According to Fung, et al. (2012), sleep disturbance are persistent among the elderly staying in assisted living facilities in Los Angeles. The prevalence of poor sleep quality was high as 60.3% among elderly in Turkey's nursing home (Orhan, et al., 2012). Poor sleepers took up approximately 50% in South Korean elderly population (Park, Yoo and Bae, 2013). Neikrug and Ancoli-Israel (2010) stated elderly living in institutions experienced more sleep problems than community population as they are inactive or immobile most of the time. Other factors influencing sleep quality among institutionalized elderly are physical illness, psychological disorders and environment factors like light, noise and extreme temperature (Neikrug and Ancoli-Israel, 2010; Shahar, et al., 2011). In Malaysia, the sleep quality of institutionalized elderly was poor (Azri, et al., 2016). There was 76.8% of elderly living in old's folk home had poor sleep quality (Rashid, Ong and Wong, 2012).

2.2.2. DEPRESSION STATUS AMONG ELDERLY GLOBALLY AND IN MALAYSIA

WHO (2016) revealed that 7% of the general elderly population suffers from unipolar depression and this accounts for 5.7% of Years Lived with Disability (YLDs) among the elderly. The prevalence of depression among elderly citizens aged ≥ 65 years in England and United State were 17.6% and 14.6% respectively (Zivin, et al., 2010). A study conducted by Mahmutović, et al. (2012) found out that there was 65.3% of elderly citizens in gerontology center in Sarajevo, Bosnia and Herzegovina had depression. In Turkey, 60.3% of the elderly in nursing home was detected with depression (Orhan, et al., 2012). Tiong, et al. (2013) claimed there was 21.1% prevalence of depression among elderly in nursing home in Singapore. In Malaysia, the prevalence of depression among institutionalized elderly was 71.8% (Shahar, et al., 2011). Poor physical health, functional inability and socioeconomic factor were pointed to be the factors leading to depression among elderly (Li, et al., 2011; Shahar, et al., 2011).

2.2.3. SOCIODEMOGRAPHIC VARIABLES ASSOCIATED WITH SLEEP QUALITY

2.2.3.1. AGE

Significant association between sleep quality and age was evident in the study did by Li, et al. (2013) in Anhui and Luo, et al. (2013) in Shanghai, indicating sleep quality was poorer in community-dwelling elderly with older age. The findings of Razali, et al. (2016) in primary care centre in Malaysia also proved the association

was significant that older age elderly had poorer sleep quality. However, age showed no association with poor sleep quality in the study conducted by Chang, et al. (2014) among Korean elderly population because the participants were not entirely representative of the population. No association between sleep quality and age among elderly was also observed in by Wu, et al. (2012) in Taiwan, by Niu, et al. (2016) in China and by Rashid, Ong and Wong (2012) in institution in Malaysia.

2.2.3.2. GENDER

Poor sleep quality was reported to be more prevalent in female elderly and the association was shown statistically significant (Dehghankar, et al., 2018; Li, et al., 2013; Lo and Lee, 2012; 2013; Wu, et al., 2012; Zhang, et al., 2017). On the contrary, Daglar, et al. (2014) discovered the sleep quality was not significantly associated with gender among elderly either staying at home or in a nursing home in Turkey. The result was further supported by the study of Luo, et al. (2013) among community-dwelling elderly in Shanghai and Razali, et al. (2016) among elderly in primary care centre in Malaysia that gender did not influence the sleep quality of elderly.

2.2.3.3. MARITAL STATUS

Despite the association between sleep quality and marital status among elderly was found significant, contradicting findings were obtained. Wu, et al. (2012) and

Zhang, et al. (2017) addressed that single, divorced and widowed elderly were prone to have poor sleep quality compared to married elderly in Taiwan and China respectively. On the other hand, the study conducted by Rashid, Ong and Wong (2012) in old folk's home in Malaysia showed higher prevalence of poor sleep quality in married elderly. The difference might be due to the psychological stress of married elderly who are living separately for family commitment following the family structure in Malaysia, which could affect their quality of sleep.

2.2.3.4. EDUCATIONAL LEVEL

It was discussed in the study of Altiok, et al. (2012) in Pakistan, Luo, et al. (2013) in Shanghai and Zhang, et al. (2017) in China that educational level was associated with sleep quality among elderly, with lower educational level being poorer in their sleep quality. Conversely, several previous studies reviewed no significant association was identified between sleep quality and educational level among elderly (Dehghankar, et al., 2018; Rashid, Ong and Wong, 2012; Wu, et al., 2012). The variance might be attributed to different proportion of sample sizes in each educational level and different ways of educational level being categorized.

2.2.3.5. LENGTH OF STAY

Two prior studies highlighted that length of stay had no association with sleep quality among elderly in nursing homes in Isfahan and Turkey (Abdullahzadeh, Matourypour and Naji, 2017; Orhan, et al., 2012). The association between sleep

quality and length of stay among elderly had not been investigated in Malaysia. Thus, researcher is keen to add it in as selected demographic variable to determine the association with sleep quality among elderly.

2.2.4. SLEEP QUALITY AND DEPRESSION

Significant association was shown between sleep quality and depression in older adults (Altiok, et al., 2012; Jaussent, et al., 2011; Kim and Hwang, 2017; Maglione, et al., 2012; Paudel, et al., 2013). Bao, et al. (2017) described elderly with poor sleep quality was at higher risk of incident depression. In spite of that, Shahar, et al. (2011) and Yu, et al. (2016) addressed that only little information was available on the association of poor sleep quality on depression, more investigations on this association have to be carried out. There was one article presented that the association between sleep quality and depression was not able to be detected owing to different cultural characteristics in north-east of Brazil (Lopes, et al., 2015).

In Turkey, PSQI sub-scores (subjective sleep quality, sleep latency and sleep disturbances) was significantly correlated with GDS scores (Orhan, et al., 2012). A study conducted by Chang, et al. (2014) revealed that there was significant association between PSQI sub-scores of poor subjective sleep quality, longer sleep latency and the frequent use of sleeping medication with greater level of depression in Korea. Furthermore, in China, subscales of sleep duration and daytime dysfunction were found to be positively correlated with depression among

elderly (Liu, et al, 2017). Yu, et al. (2016) stated in Singapore that GDS was significantly associated with sleep disturbance and daytime dysfunction. The understanding of association between sleep quality and depression among elderly in assisted living facilities in Malaysia is lacking and limited. By taking the negative consequences of poor sleep quality and depression could bring into consideration, there is therefore a need to conduct the research on this association.

2.3. CONCEPTUAL FRAMEWORK

The association between sleep quality and depression can be conceptualised at a fairly general level, illustrated in Diagram 2.2. The conceptual framework is based on “Maslow’s Hierarchy of Needs” theory developed by Maslow, A.H. in 1943 that addressed the five stages of human needs (McLeod, 2017). Certain needs have to be met before higher stage of needs could take precedence over others. Not all humans are able to reach the top of the hierarchy.

Sleep quality, which has been identified as one of the physiological needs in the most fundamental level of the hierarchy, is assessed using Pittsburgh Sleep Quality Index (PSQI) in this study. Maslow discussed that the progression in the pursuit of next level of needs is disrupted when one does not fulfil lower level needs successfully. In other words, failure to achieve physiological needs will become the hindrance for the satisfaction of the needs above which are self-fulfilment and psychological needs. Selected socio-demographic variables, which determine the fulfilment of psychological needs (safety and security; belongingness and love;

self-esteem) among elderly, will in turn play roles in affecting sleep quality. Failure to achieve the stages of self-fulfilment and psychological needs could lead to mental illness, such as depression, which will be assessed using Geriatric Depression Scale (GDS) in this study. Based on the conceptual framework, this study is conducted to determine the association between sleep quality and depression among elderly in assisted living facilities.

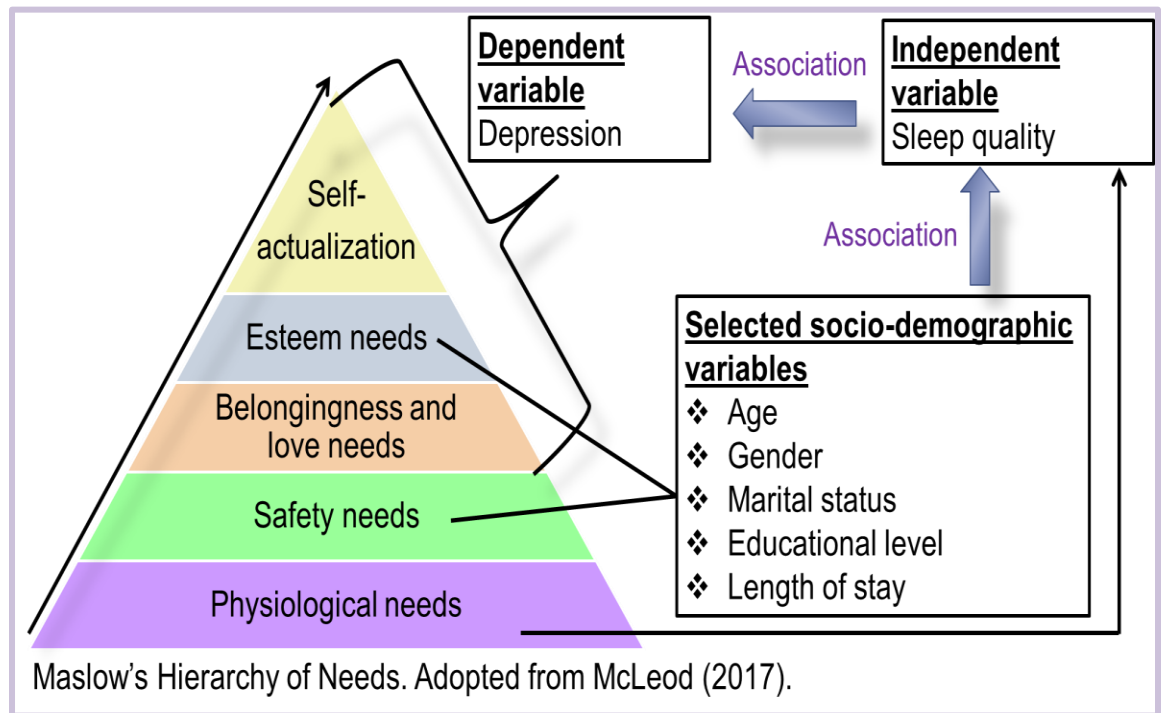


Diagram 2.2: Conceptual framework between sleep quality, selected socio-demographic variables and depression

2.4. SUMMARY

Studies from overseas revealed high prevalence of poor sleep quality and depression among community-dwelling and institutionalized elderly. Association

of sleep quality with selected sociodemographic variables was found, except for length of stay. Sleep quality showed also association with depression. The association have to be addressed and investigated further among elderly in assisted living facilities to fulfil the physiological need, prevent development of mental illness and improve quality of life of elderly. The methodology of the research will be discussed in next chapter.

CHAPTER THREE

METHODOLOGY

CHAPTER THREE: METHODOLOGY

3.0. CHAPTER OVERVIEW

In this chapter, the selected research design, setting of the study, population, sample, sampling, variables, instrument, validity and reliability, pilot study, data collection procedure, ethical consideration and consent information will be explained in details.

3.1. RESEARCH DESIGN

This research is a non-experimental quantitative descriptive, correlational study. Correlation design allows direction (positive or negative) and strength of the association between two or more variables within one group to be investigated but it does not determine the cause and effect of variables (Richardson-Tench, et al., 2014). In this study, the association between sleep quality and depression among elderly in assisted living facilities is examined. Besides, this design is also time and cost effective and easy to be conducted. Questionnaire will be completed by the elderly in assisted living facilities with the assistance provided by the researcher.

3.1.1. SETTING OF THE STUDY

The study was conducted at 13 non-government funded elderly assisted living facilities within Klang Valley in Malaysia. The facilities were listed below in Table 3.1.

Table 3.1: List of assisted living facilities and the number of overall samples before applying exclusion criteria

No.	Name of Assisted Living Facilities	Overall Samples
1.	Victory Home	54
2.	Sungai Way	43
3.	Persatuan Kebajikan Orang Tua Rahmat	11
4.	House of Joy	25
5.	My Father's Home	76
6.	Ampang Home	15
7.	Onn Onn	11
8.	Love And Care	13
9.	Tiam Yuan	28
10.	Chik Sin Thong	22
11.	Ti-ratana	38
12.	Sri Jayanthi	12
13.	St. Mark	36
Total		384

3.1.2. TARGET POPULATION

The target population in this study was elderly who are 60 years old and above and the accessible population was 384 elderly in 13 assisted living facilities within Klang Valley, Malaysia. After the application of exclusion criteria which will be stated in section 3.3.3.2., 274 elderly was recruited as the sample of this study.

3.2. VARIABLES

Variables in research can be termed as measurable attribute that change across the study (Raiphea, 2015). Types of variables that were used in this study are independent, dependent and social demographic variables. When determining the association between sleep quality and selected sociodemographic variables among elderly, age, gender, marital status, educational level and length of stay are the sociodemographic variables and sleep quality is the dependent variable. On the other hand, when determining the association between sleep quality and depression among elderly, sleep quality is the independent variable and depression is the dependent variable.

3.3. SAMPLING

3.3.1. SAMPLING METHOD

Convenience sampling was used as the sampling method in this study. The reasons why convenience sampling was selected are when comparing it to other methods, it is one of the most time-cost effective and accessible non-probability sampling

methods (Grove, Burns and Gray, 2013). This method is ideal for this study as it does not require the list of study population before including them in the study and it helps to save time and cost. The elderly in assisted living facilities within Klang Valley were easily accessible for the researchers and were all taken as the subjects for this study.

3.3.2. SAMPLE SIZE

The sample size was calculated by using the following sample size formula provided by Kish L. 1960 formula from Kish (1965):

$$N = \frac{(Z_{1-\alpha})^2 P(1-P)}{D^2} = \frac{(1.96)^2 0.181 (1-0.181)}{0.05^2} = 228$$

$$N = 228 + 0.2 (228) = 274$$

Here, N is estimated sample size;

$(Z_{1-\alpha})$ is confidence interval of 1.96;

P is prevalence of previous study by Bao, et al. (2017) in China;

D is allowable error; 5% = 0.05.

The estimated sample size was 228 and additional 20% was included in the sample size for attrition rate. After the addition, the final sample size was 274.

3.3.3. SAMPLING CRITERIA

3.3.3.1. INCLUSION CRITERIA

- Elderly who are 60 years old and above.
- Elderly who are able to communicate.
- Elderly who are agree to give consent in participation.

3.3.3.2. EXCLUSION CRITERIA

- Those who are below 60 years old.
- Elderly who are unable to communicate (e.g. hearing impairment which impeded the completion of questionnaire).
- Elderly who are living in the assisted living facilities less than 3 months.
- Elderly with cognitive impairment - having trouble to remember, learn, concentrate and make decisions (e.g. Alzheimer and dementia).
- Elderly with mental illness (e.g. depression and schizophrenia), including those who are on treatment.
- Elderly who refused to participate or requested to withdraw during the study.

3.4. RESEARCH INSTRUMENT

The research instrument used was quantitative assessment tool which consists of 3 sections. Section A: sociodemographic questionnaire, Section B: Pittsburgh Sleep Quality Index (PSQI) and Section C: Geriatric Depression Scale (GDS) - Short

Form. It is shown in Appendix B and the Chinese version is attached in Appendix C.

3.4.1. SECTION A: SOCIODEMOGRAPHIC QUESTIONNAIRE

The sociodemographic questionnaire included 5 close-ended questions regarding age, gender, marital status, educational level and length of stay in assisted living facilities of the participants. Data collected were analysed to answer the research question 3 to determine the association between sleep quality and selected sociodemographic variables among elderly.

3.4.2. SECTION B: PITTSBURGH SLEEP QUALITY INDEX (PSQI)

PSQI was used as the tool to assess the sleep quality status of participants in this study. It composes of 19 questions and the status was determined by the measurement of 7 components, which are subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications and daytime dysfunction over the last month. Each component is scored from 0 – 3 and global PSQI score is obtained by summarizing the 7 component scores. The total score ranges from 0- 21 with a total score of 5 or above indicates poor sleep quality (Spira, et al., 2011). Higher scores reflected poorer sleep quality. The method to calculate the score of each component is attached in Appendix B. PSQI was translated into Chinese version by Fo Guang Shan Compassion Foundation.

3.4.3. SECTION C: GERIATRIC DEPRESSION SCALE (GDS) - SHORT FORM

GDS – Short Form is a tool developed to perform basic screening for depression in older adults (Yesavage, et al., 1983). It comprises of 15 questions and one point was assigned for each particular answer in bold. A score of 0-5 is normal while the score greater than 5 suggests depression. The Chinese version of GDS – Short Form was translated by National Ageing Research Institute (NARI).

3.4.4. VALIDITY AND RELIABILITY

Validity determines the extent to which an instrument actually reflects and reliability measures the consistency of the measures of an attribute obtained in the study's instrument (Grove, Burns and Gray, 2013). Cronbach's Alpha is the test to measure the reliability of tool and the tool is reliable when Cronbach's Alpha is within the acceptable range is from 0.70 – 0.95 (Tavakol and Dennick, 2011). PSQI was developed by Buysse, et al. (1989) and being widely used to measure the sleep quality in older adults. Its validity and reliability have been proven with 89.6% of sensitivity, 86.5% of specificity and Cronbach's alpha of 0.83 (Buysse, et al., 1989). Furthermore, it was adopted in the study of ethnically similar population by Yu, et al. (2016) in Singapore.

GDS, which developed by Yesavage, et al. (1983), was utilized as a screening tool of depression for Asian elderly with 97% of sensitivity, 95% of specificity and

Cronbach's alpha of 0.80 (Nyunt, et al., 2009). Validity and reliability have been supported through both clinical practice and research (Greenberg, 2012).

3.4.5. PILOT STUDY

The objectives of pilot study are to verify the questionnaire, determine the feasibility of the main study from the results obtained and identify problems that would be encountered during the main study, so appropriate modification can be done. Face and content validity of questionnaire was validated by one internal department lecturer and one external department lecturer. Pilot study was conducted on 27 elderly, which is 10% from the final sample size, at Caring Home, Charis Home and Victory Home on 6 June 2018, 8 June 2018 and 13 June 2018 respectively. The respondents were able to understand and answer the questions accordingly and they were not included in the main research. The Cronbach's alpha of PSQI (0.728) and GDS (0.704), which calculated from the pilot study, showing that both assessment tools are reliable.

3.5. DATA COLLECTION

Data collection was conducted from June 2018 to July 2018 after obtaining ethical clearance from UTAR ethical board. Permissions from the concerned parties of assisted living facilities were obtained as well as informed consent from the participants prior to data collection. Questionnaire was completed using the

preferred languages of elderly and with the assistance provided by researchers.

The flow chart of data collection is shown in Diagram 3.1.

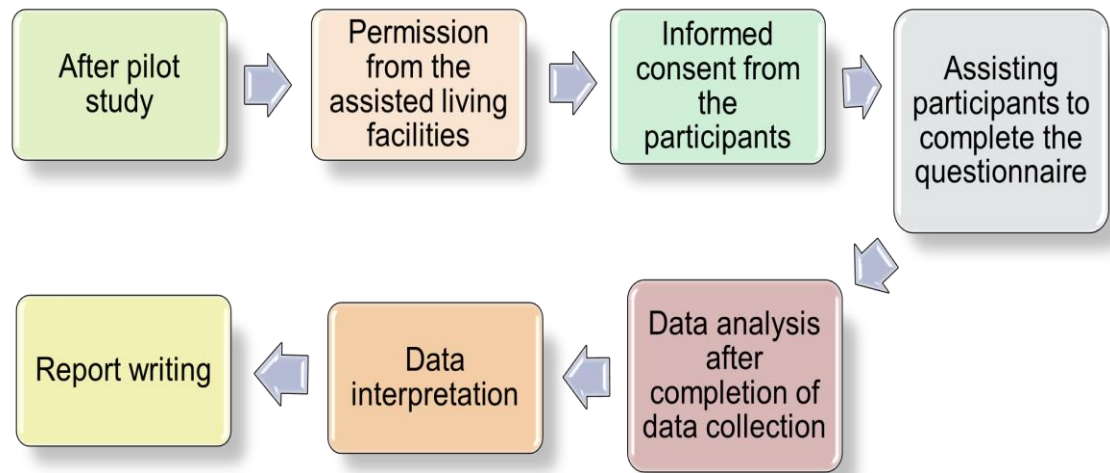


Diagram 3.1.: Data collection flow chart

3.6. ETHICAL CONSIDERATION

Researcher ensured that the ethical approval was obtained from ethical board of UTAR 6 weeks before the commencement of the research. The ethical approval application form is attached in Appendix D and the ethical clearance approval letter is attached in Appendix E. In addition, informed consent was obtained from both the owner of assisted living facilities and the participants before any visitations made. Participants were being notified that they are allowed to withdraw from the study at any time they want to and confidentiality and anonymity would be ensured and maintained. Moreover, the collected data were kept safely in locked cabinet and the files in computer were encrypted with

password. Only the researcher could access to the data. Lastly, the data would be kept for 7 years before disposal.

3.6.1. CONSENT INFORMATION

The purpose of the study was explained by the researchers to the participants and they were informed that information will not be disclosed to anyone and they are free to withdraw from the research at any time. The content of Cover letter of Recruitment has been included in the information sheet and consent form was shown in Appendix A. Hence, only the information sheet and consent form were given to and signed by the participants before the study.

3.7. SUMMARY

The reasons of the selected methods and instruments used for current study were justified in this chapter. The methodology was carried out accordingly to yield data, which will be analysed and interpreted in the following chapter.

CHAPTER FOUR

DATA ANALYSIS AND RESULT

CHAPTER FOUR: DATA ANALYSIS AND RESULT

4.0. CHAPTER OVERVIEW

Statistical Packages for the Social Sciences version 23 (IBM SPSS Statistics 23) was used for data analysis. The statistical analysis for each specific objective, data processing and the results obtained will be discussed in details in this chapter.

4.1. DESCRIPTIVE AND INFERENTIAL ANALYSIS

4.1.1. DESCRIPTIVE ANALYSIS

- The categorical data were presented in number and percentage while the continuous data were presented in mean and standard deviation.
- The characteristics of participants with sociodemographic variables (age, gender, marital status, educational level and length of stay) were presented in number and percentage.
- The mean scores of both sleep and depression scales were presented in mean and standard deviation.
- The first and second specific objectives, the sleep quality status and depression status among elderly in assisted living facilities, were presented in number and percentage.

4.1.2. INFERENCE ANALYSIS

- Chi-square tests were done for third and fourth specific objectives, which were to determine the association between sleep quality and selected sociodemographic variables and to determine the association between sleep quality and depression.
- Pearson correlation test was further done for fourth specific objective to determine the strength and direction of the association between sleep quality and depression.

4.2. STATISTICAL DATA PROCESSING AND ANALYSIS

A total of 384 participants were available for this study before exclusion criteria was applied. After the participants were being screened following the exclusion criteria, 274 eligible participants were involved in the final study. Chi-square test and Pearson correlation test were used with p value <0.05 being statistically significant. In Pearson correlation test, the more the results (r) near to +1, the more the strength of correlation. Positive value of r signified the direction of correlation, indicating when the independent variable increases, the dependent variable also increases. In contrast, the negative value of r showed that when one of the variables increases, the other tends to decrease.

4.3. RESULTS

4.3.1. DESCRIPTIVE STATISTICS

4.3.1.1. CHARACTERISTICS OF PARTICIPANTS

Table 4.1: Characteristics of participants, N= 274.

Sociodemographic variables	n (%)
Age	
60 – 79	172 (62.8%)
≥ 80	102 (37.2%)
Gender	
Male	128 (46.7%)
Female	146 (53.3%)
Marital status	
Single	131 (47.8%)
Married	41 (15.0%)
Widowed	83 (30.3%)
Divorced	19 (6.9%)
Educational level	
None	78 (28.5%)
Primary	125 (45.6%)
Secondary	57 (20.8%)
Tertiary	14 (5.1%)
Length of stay (months)	
3 – 11	41 (15.0%)
12 – 36	122 (44.5%)
> 36	111 (40.5%)

N = total sample size, n = number of participants, categorical data presented by n (%)

Table 4.1 depicted the characteristics of total number of 274 participants recruited in this study. Age had been categorized into two groups, which are 60-79 years old and 80 years old and above. There were more participants (n=172) in the age group of 60-79 years old, which consisted of 62.8%, compared to the participants (n=102) in the age group of 80 years old and

above, which made up of 37.2%. 53.3% of the participants (n=146) are female, which was higher than male participants (n=128), which occupied 46.7% out of 274 participants.

In terms of marital status, majority of the participants (n=131) are single, which took up the most portion with 47.8%. The least portion was found in divorced participants (n=19) with only 6.9%. Furthermore, the amount of participants with primary educational level (n=125) was the highest with 45.6% and the lowest was those with tertiary educational level (n=14) with 5.1%. Regarding the length of stay of participants in assisted living facilities, it was being categorized into 3-11 months, 12-36 months and more than 36 months. Majority of the participants (n=122) had been staying in assisted living facilities between 12-36 months, which made up of 44.5% while the least was made up of only 15% for those (n=41) with length of stay between 3-11 months.

4.3.1.2. MEAN SCORES OF SLEEP AND DEPRESSION SCALES

Table 4.2: Mean scores of sleep and depression scales, N = 274.

Variables	Mean (sd)
PSQI components:	
Subjective sleep quality	1.13 (0.92)
Sleep latency	1.43 (1.21)
Sleep duration	1.26 (1.06)
Habitual sleep efficiency	1.34 (1.18)
Sleep disturbances	0.97 (0.41)
Use of sleeping medication	0.11 (0.56)
Daytime dysfunction	0.53 (0.79)
Global PSQI score	6.77 (3.98)
GDS	3.82 (3.44)

Range of scoring in the scale:
Global PSQI score → 0 – 21
Each component of PSQI → 0 – 3
GDS → 0 – 15

N = total sample size, sd = standard deviation, PSQI = Pittsburgh Sleep Quality Index, GDS = Geriatric Depression Scale, continuous data presented by mean (sd)

Mean scores of sleep and depression scales for 274 participants were presented in Table 4.2. The higher the score, the greater the severity of status was being reflected. Among the mean values of 7 PSQI score components, sleep latency possessed the highest subscale score at 1.43 (SD=1.21), whereas the lowest subscale score was use of sleeping medication at 0.11 (SD=0.56). The mean global PSQI score was 6.77 (SD=3.98), the scoring ≥ 5 suggesting elderly were having poor sleep quality generally. For the mean depression score, it was 3.82 (SD=3.44) which scored ≤ 5 indicating elderly did not have depression in general.

4.3.1.3. SLEEP QUALITY STATUS OF PARTICIPANTS

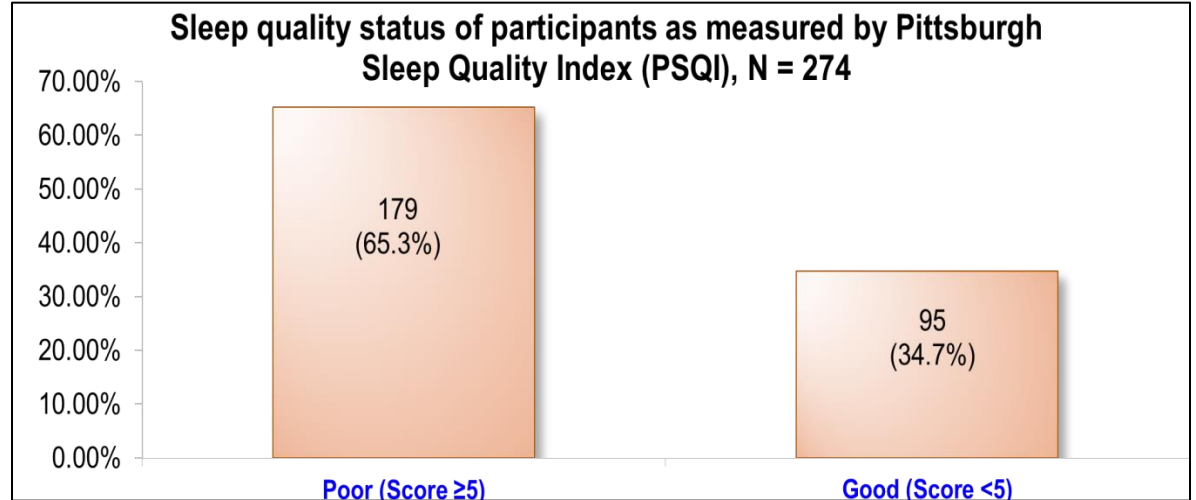


Figure 4.1: Sleep quality status of participants as measured by Pittsburgh Sleep Quality Index (PSQI), N= 274.

Sleep quality status of 274 participants as measured by PSQI were shown in Figure 4.1. Each of the score from 7 PSQI components (subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, use of sleeping medication and daytime dysfunction) was added up to generate the result. Poor sleep quality was indicated by a total score of 5 or greater and good sleep quality was reported by a total score of 0-4. 65.3% of the elderly (n=179) had poor sleep quality while 34.7% of the elderly (n=95) had good quality of sleep.

4.3.1.4. DEPRESSION STATUS OF PARTICIPANTS

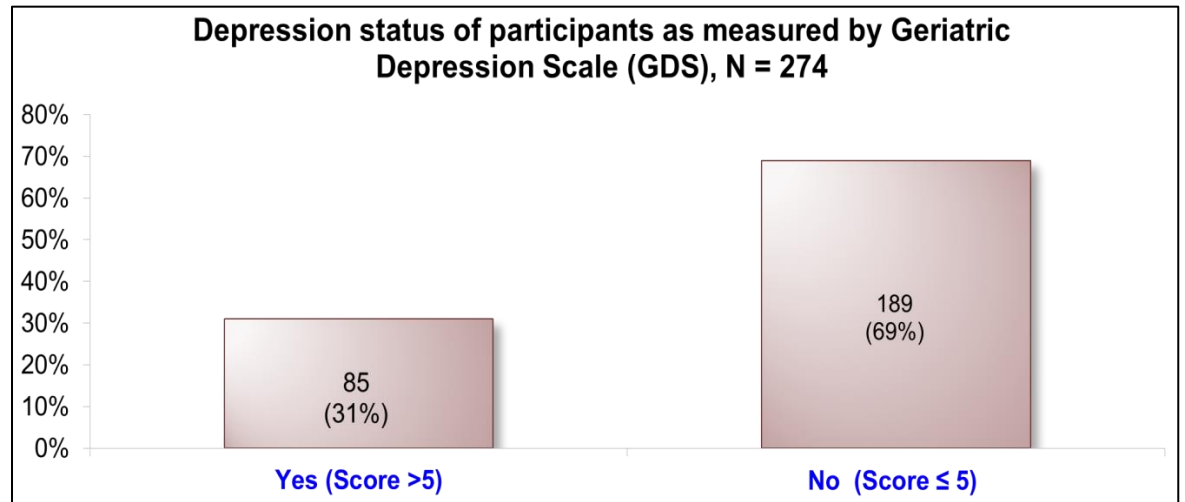


Figure 4.2: Depression status of participants as measured by Geriatric Depression Scale (GDS), N= 274.

Figure 4.2 demonstrated the depression status of 274 participants as measured by GDS. Depression was suggested by a total score of above 5 while a total score of 0-5 does not suggest depression. Based on the scores obtained, there were 31% of the elderly (n=85) suggestive of depression and 69% of the elderly (n=189) did not suggest of depression.

4.3.2. INFERENCE STATISTICS

4.3.2.1. ASSOCIATION BETWEEN SLEEP QUALITY AND

SOCIODEMOGRAPHIC VARIABLES (AGE, GENDER, MARITAL STATUS, EDUCATIONAL LEVEL AND LENGTH OF STAY)

Table 4.3: Association between sleep quality and sociodemographic variables

(Age, Gender, Marital status, Educational level and Length of stay)

Sociodemographic variables	Sleep quality		χ^2	Df	POR	p value
	Poor n (%)	Good n (%)				
Age						
60 - 79	117 (68.0%)	55 (32.0%)	1.481*	1	0.729	0.224
≥80	62 (60.8%)	40 (39.2%)				
Gender						
Male	84 (65.6%)	44 (34.4%)	0.009*	1	0.976	0.923
Female	95 (65.1%)	51 (34.9%)				
Marital status						
Single	80 (61.1%)	51 (38.9%)	2.932*	3	NA	0.402
Married	28 (68.3%)	13 (31.7%)				
Widowed	56 (67.5%)	27 (32.5%)				
Divorced	15 (78.9%)	4 (21.1%)				

Educational level							
None	53 (67.9%)	25 (32.1%)	0.721*	3	NA	0.868	
Primary	79 (63.2%)	46 (36.8%)					
Secondary	37 (64.9%)	20 (35.1%)					
Tertiary	10 (71.4%)	4 (28.6%)					
Length of stay (months)							
3 - 11	23 (56.1%)	18 (43.9%)	1.849*	2	NA	0.397	
12 - 36	81 (66.4%)	41 (33.6%)					
> 36	75 (67.6%)	36 (32.4%)					

*Chi-Square test was performed, level of significance at $p < 0.05$, df = degree of freedom, POR = Prevalence Odds Ratio.

The association between sleep quality and sociodemographic variables was illustrated in Table 4.3. The elderly in the age group of 60-79 years old (68%) had higher prevalence of poor sleep quality compared to the age group of 80 years old and above (60.8%). However, the difference in prevalence of poor sleep quality between both age groups was not statistically significant ($p > 0.05$). Therefore, there was no association between sleep quality and age among the elderly.

The prevalence of elderly with poor sleep quality was slightly higher in male (65.6%) than female (65.1%). The result showed there was no statistically significant differences in the prevalence of poor sleep quality between genders as p value is more than 0.05. Thus, there was no association between sleep quality and gender among the elderly.

The prevalence of poor sleep quality in divorced elderly (78.9%) was the highest and it was followed by married (68.3%), widowed (67.5%) and single elderly (61.1%). There was no statistically significant difference between sleep quality and marital status ($p>0.05$). Hence, there was no association between sleep quality and marital status among the elderly.

The highest prevalence of poor sleep quality among elderly was those with tertiary educational level (71.4%). Elderly who never received any formal education (67.9%) occupied the second highest prevalence of poor sleep quality and followed by elderly with secondary educational level (64.9%) and primary educational level (63.2%). The difference between sleep quality and educational level was not statistically significant ($p>0.05$), signifying there was no association between sleep quality and educational level among the elderly.

Elderly who have been staying in assisted living facilities for more than 36 months (67.6%) had higher prevalence of poor sleep quality as compared to those with length of stay of 12-36 months (66.4%) and 3-11 months (56.1%). The result indicated there was no statistically significant difference between

sleep quality and length of stay ($p>0.05$). So, there was no association between sleep quality and length of stay among the elderly in assisted living facilities.

In summary, poorer sleep quality were identified in age of elderly ranged from 60-79 years old, elderly male, divorced elderly, elderly with tertiary educational level and those with length of stay in assisted living facilities for more than 36 months comparing to other groups of elderly. However, age, gender, marital status, educational level and length of stay were found not statistically significant affecting the sleep quality of elderly as all the p values were more than 0.05. The null hypothesis (H_{01}) was failed to be rejected. Therefore, there was no association between sleep quality and sociodemographic variables among elderly in assisted living facilities.

4.3.2.2. ASSOCIATION BETWEEN SLEEP QUALITY AND DEPRESSION

Table 4.4: Association between sleep quality and depression

Sleep quality	Depression		χ^2	df	POR	p value
	Yes n (%)	No n (%)				
Poor	74 (41.3%)	105 (58.7%)	25.690*	1	5.382	<0.001*
Good	11 (11.6%)	84 (88.4%)				

*Chi-Square test was performed, level of significance at $p < 0.05$, df = degree of freedom, POR = Prevalence Odds Ratio.

According to Table 4.4, prevalence of depression was higher among elderly with poor sleep quality (41.3%) as compared to elderly with good sleep quality

(11.6%). Elderly with poor quality of sleep was approximately 6.7 times more likely to have depression than those with good quality of sleep. The difference in prevalence of depression between both sleep quality statuses of elderly was statistically significant ($p < 0.001$). Thus, the null hypothesis (H_{02}) was rejected. There was significant association between sleep quality and depression among elderly in assisted living facilities.

Table 4.5: Association between sleep and depression scores, N = 274.

Variable	Depression	
	r	p value
PSQI components:		
Subjective sleep quality	0.307*	<0.001
Sleep latency	0.313*	<0.001
Sleep duration	0.255*	<0.001
Habitual sleep efficiency	0.303*	<0.001
Sleep disturbances	0.146*	0.016
Use of sleeping medication	-0.012*	0.843
Daytime dysfunction	0.270*	<0.001
Global PSQI score	0.391*	<0.001

*Pearson correlation analysis was performed, level of significance at $p < 0.05$, r is correlation coefficient, PSQI = Pittsburgh Sleep Quality Index.

Table 4.5 displayed the association between sleep and depression scores. All the sleep PSQI components except for the use of sleeping medication were positively correlated with depression as r were in positive value. The strength of correlation

with depression was the strongest in sleep latency ($r=0.313$) while the weakest in sleep disturbances ($r=0.146$). The correlations were statistically significant since the p values were less than 0.05. Thus, there was association between subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, daytime dysfunction and depression. Only the use of sleeping medication had negative correlation with depression and the correlation was not statistically significant ($p>0.05$). Hence, there was no association between the use of sleeping medication and depression.

In overall, there was positive correlation between sleep and depression scores as r was 0.391. The result showed the correlation was statistically significant ($p<0.05$). Therefore, the null hypothesis (H_{02}) was rejected. There was an association between sleep quality and depression among elderly in assisted living facilities. Inference of the poorer the sleep quality, the greater the level of depression could be made.

4.4. SUMMARY

The results from data analyses reported that the prevalence of poor sleep quality was high as 65.3% and the prevalence of depression was low as 31% among elderly in assisted living facilities. Furthermore, there was no association between sleep quality and selected sociodemographic variables (age, gender, marital status, educational level and length of stay) among elderly. However, significant

association was found between sleep quality and depression among elderly. The prevalence of depression was detected 6.7 times higher in elderly with poor sleep quality than those with good sleep quality. Among the 7 PSQI components, the strength of positive correlation with depression was the strongest in sleep latency while the weakest in sleep disturbances. Only the use of sleeping medication was not associated with depression. The results will be discussed further along with prior studies in next chapter.

CHAPTER FIVE

DISCUSSION

CHAPTER FIVE: DISCUSSION

5.0. CHAPTER OVERVIEW

There will be detailed discussion on findings according to the specific objectives, addressing the sleep quality status, depression status, the association between sleep quality and selected sociodemographic variables, and the association between sleep quality and depression among elderly in this chapter.

5.1. DISCUSSION OF MAJOR FINDINGS

5.1.1. SLEEP QUALITY STATUS

In this study, the prevalence of poor sleep quality among elderly in assisted living facilities was 65.3%. It showed that the sleep quality is poor among elderly in assisted living facilities, which was consistent with the previous studies in Malaysia (Azri, et al., 2016; Rashid, Ong and Wong, 2012). Antypa, et al. (2012), Bao, et al. (2017) and Kondratova and Kondratov (2012) explained that the effects of ageing on the central nervous system, such as advanced phase and declined amplitude of circadian rhythm and clock gene alterations, could result in impaired sleep among elderly. Furthermore, the highest PSQI subscale score fell in sleep latency while the lowest score was the use of sleeping medication in this study. The same findings were revealed in the study conducted by Orhan, et al. (2012) in Turkey. Trouble in falling asleep was reflected and the least in the use of sleeping medication might be due to sleeping medication is not widespread (Orhan, et al., 2012).

Suzuki, Miyamoto and Hirata (2017) and Orhan, et al. (2012) stated that relative to younger people, elderly tend to have difficulty in falling and maintaining asleep attributed to the changes of sleep pattern. Though the time spent by elderly in bed is longer, actual duration of sleep is actually lesser. Most of the poor sleep quality could be worsened by institutional settings (Orhan, et al., 2012). Altioğlu, et al. (2012) and Neikrug and Ancoli-Israel (2010) pointed out that being physically inactive contributes to poor sleep quality. Some of the elderly were afraid and not allowed to go out of the assisted care facilities, this made them to be immobile and confined to the particular area which could lead to sleep impairment. Physical illness, psychological disorders, medications and environment factors were the other factors affecting the sleep quality among elderly in institutions (Neikrug and Ancoli-Israel, 2010; Shahr, et al., 2011). Besides, it was emphasized by World Sleep Society (2018) that environmental factors, such as temperature, noise, light, bed comfort and electronic distractions, took part in influencing the overall sleep-related wellness.

5.1.2. DEPRESSION STATUS

There were 31% of the elderly suggested of depression in this study. Antypa, et al. (2012) and Kondratova and Kondratov (2012) described that the changes occur in central nervous system resulting from ageing contribute to the development of depression. However, the percentage was not aligned with the high prevalence of depression (60.3%) detected among elderly in nursing home in Turkey (Orhan, et al., 2012). The variance in prevalence might be due to vary in localities and

sample sizes. Orhan, et al. (2012) claimed that vary in localities might reflect differences in the characteristics of study populations and diagnostic criteria. The sample sizes included in Orhan, et al. (2012) was only 74 participants, which were lesser than the current study.

Apart from that, the prevalence of depression in this study was also inconsistent with the study conducted by Shahar, et al. (2011) in institution in Malaysia with 71.8% of high percentage of depression found. It might be because of the smaller sample sized was used in prior study and the stigma associated with reporting mental illness (Zaroff, et al, 2012). According to Roh, et al. (2015), religious belief could be the confounding factor that decreased the risk of depression as association was found in the study. Hayward, et al. (2012) indicated religious belief increases resilience and enhances mood, thus it could prevent an individual from getting mental illness like depression. Physical illness, use of medications, low level of physical activity and socioeconomic status were also identified as the factors that might render the differences in prevalence of depression (Abe, et al., 2012; Maglione, et al., 2012; Paudel, et al., 2013).

5.1.3. SLEEP QUALITY AND SOCIODEMOGRAPHIC VARIABLES

In this study, there was no association between sleep quality and selected sociodemographic variables (age, gender, marital status, educational level and length of stay) among elderly in assisted living facilities.

5.1.3.1. SLEEP QUALITY AND AGE GROUP

Prevalence of poor sleep quality was demonstrated higher among elderly in the age group of 60-79 years old compared to the age group of 80 years old and above. The results that indicated sleep quality did not influence by age were aligned with the study conducted by Chang, et al. (2014). On the contrary, the findings were contraindicated with the studies did by Dehghankar, et al. (2018) and Rashid, Ong and Wong (2012) that older age was associated with poorer sleep quality. Physiological change with ageing was noted to affect the sleep quality. The discrepancy might owe to the reason of unequal percentage of elderly in both age groups with more elderly (62.8%) in the age group of 60-79 years old than elderly (37.2%) in the age group of 80 years old and above. Moreover, Almeida, et al. (2011) highlighted that medical illness might confound the association with sleep quality of elderly.

5.1.3.2. SLEEP QUALITY AND GENDER

Sleep quality of elderly was slightly poorer in man than woman but the association was not statistically significant in this study. It was consistent with the findings of Orhan, et al. (2012) and Rashid, Ong and Wong (2012). Conversely, Chang, et al. (2014) obtained the otherwise with woman being poorer in sleep quality. The factors of the inconsistency might be varying in type of settings, study methods and sample size employed. In the study of Chang, et al. (2014), the setting was in community, cohort study was chosen as the study methods and more sample sizes were included. Quan, et al. (2016), Dağlar, et al. (2014) and Wu, et al. (2012) also

discovered woman was more prevalent in having poor sleep quality. It was supported by Altıok, et al. (2012) that there are more physiological changes in women, menopause and responsibility as caretakers may be considered to disrupt the sleep quality.

5.1.3.3. SLEEP QUALITY AND MARITAL STATUS

No association was shown between sleep quality and marital status in current study. Inconsistency was observed in the studies of Orhan, et al. (2012) and Rahid, Ong and Wong (2012) that married elderly had highest prevalence of poor sleep quality. It might be the psychological stress of married elderly from family commitment following Malaysian family structure affecting the quality of sleep. On the other hand, there was discrepancy in the study did by Wu, et al. (2012), indicating sleep quality was poorer in single, divorced or widowed elderly. The contradiction was addressed by Altıok, et al. (2012) and Costa, et al. (2013) that social support systems could be the influencing factor of sleep quality in spite of marital status. Social support facilitates the coping of psychological stress. Loneliness and without social support systems were related to poor sleep quality significantly.

5.1.3.4. SLEEP QUALITY AND EDUCATIONAL LEVEL

Present study showed educational level did not influence sleep quality among elderly and it was not in line with other previously published studies. Chang, et al.

(2014) in Korea and Zhang, et al. (2017) in China inferred from study that poorer quality of sleep was significantly correlated with lower educational level among community dwelling elderly. Altiook, et al. (2012) obtained similar results and suggested elderly with higher level of education tends to have better knowledge to figure out personal coping strategies to deal with the problems faced, such as poor sleep quality. The differences might be due to unequal percentage of sample size in different level of education, in which only 5.1% of the participants had tertiary educational level, and lesser sample sizes recruited in this study compared to prior studies.

5.1.3.5. SLEEP QUALITY AND LENGTH OF STAY

The results obtained depicted length of stay in assisted living facilities did not affect the sleep quality among elderly. This was consistent with the study of Abdullahzadeh, Matourypour and Naji, (2017) and Orhan, et al. (2012) in nursing home in Isfahan and Turkey respectively that there was no association between sleep quality and length of stay in care facilities. Riedl, Mantovan and Them (2012) revealed adaptation to the living environment could have taken place for the elderly with coping strategies utilized to adjust themselves to stay there with comfort, causing no effect on sleep quality among elderly in assisted living facilities.

5.1.4. SLEEP QUALITY AND DEPRESSION

The definitive association between sleep quality and depression among elderly has not been documented in assisted living facilities in Malaysia. In this study, poor sleep quality was found significantly associated with depression among elderly. Elderly with poor quality of sleep was more likely to have depression. Among the 7 sleep components, sleep latency had the strongest association with depression. Our results were consistent with previous studies conducted by Orhan, et al. (2012) in nursing home in Turkey and Chang, et al. (2014) among community dwelling elderly in Korea. Positive correlation between self-reported poor sleep quality and depression was detected in this study. Similar findings were available in the study of Bao, et al. (2017) based on 23 cohort studies and Liu, et al. (2017) among the community dwelling elderly in China.

Chang, et al. (2014) supported more negative thoughts and emotions are generated from poor perceived sleep quality, which increases the risk of depression. Depressive individuals are also common to perceive their sleep quality negatively and this might impede their judgements on sleep quality (Chang, et al., 2014). The association was explained by Bao, et al. (2017) and Jaussent, et al. (2011) in regards to the shared causality between poor sleep quality and depression. For instance, the risk factors such as age, gender, sleep status, stress and anxiety and the genetic predisposition involved in the regulation of Rapid Eye Movement sleep and the activity of hypothalamic pituitary adrenal axis. In addition, Bao, et al. (2017) and Kondratova and Kondratov (2012) discussed with the advanced phase and declined amplitude in circadian due to ageing, elderly wake up earlier and

more frequent. When ageing takes place, the neuronal activity of the suprachiasmatic nucleus is reduced and the circadian clock is disrupted, resulting in poor sleep quality and mood disorders like depression.

5.2. SUMMARY

The findings from previous chapter regarding sleep quality status, depression status, the association between sleep quality and selected sociodemographic variables, and the association between sleep quality and depression had been discussed in details along with previous studies in this chapter. The following chapter will be explaining about the recommendation.

CHAPTER SIX

RECOMMENDATION

CHAPTER SIX: RECOMMENDATION

6.0. CHAPTER OVERVIEW

In this chapter, strength and limitation of the study, implications of the study, gaps in the evidence, implication for future research and recommendation will be explained in details.

6.1. STRENGTH AND LIMITATION OF THE STUDY

6.1.1. STRENGTH

Face-to-face interview was conducted by the researchers to answer queries of participants and clarify doubts during data collection. Satisfactory response rate was obtained and it allowed the calculated sample size to be met. In addition, those with cognitive impairment or mental illness, including those on treatment were excluded in this study to eliminate bias. Besides, those who were staying in assisted living facilities < 3 months (adaptation period) were also excluded.

6.1.2. LIMITATION

There are several limitations we acknowledge in this study. Majority of the sample population were Chinese, the generalisation of whole Malaysian population with multiple ethnicities could not be reflected. All accessible participants from the 13 assisted living facilities were included in this study with the application of convenience sampling, the results might not be homogenous to represent the accessible population within Klang Valley. The sleep quality was determined

using self-reported or subjective measure, thus it might be subjected to recall bias. Depressive individuals might recall certain characteristics of sleep inaccurately. Furthermore, there were common confounding factors for both perceived sleep quality and depression such as medical illness, comorbidity, medication, religious belief and functional disability, which might confound the findings. The analyses done were not able to explore the covariates influencing both perceived sleep quality and depression. The causal relationship could not be determined in this study as correlational study permitted only association to be studied.

6.2. IMPLICATIONS OF THE STUDY

This research gave better understanding of association between sleep quality and depression among elderly which can raise awareness among Malaysian society on the importance of good sleep quality and psychological wellbeing. Besides, the outcome also highlights the needs to conduct routine screening to identify sleep problems and depression and initiate appropriate referral and interventions. Rules and regulations on maintaining the health and wellbeing of elderly shall be revised. Curriculum to care for elderly with health problems is recommended for those who are operating the assisted living facilities and caregivers, so that they possess the specialized knowledge and skills to provide proper care for the elderly. Furthermore, health promotion shall be conducted to promote better sleep quality and psychological wellbeing to enhance the quality of life among elderly.

One of the approaches to promote better sleep quality is giving health education about good sleep hygiene, which includes going to bed and waking up at consistent time, ensuring the bedroom's environment is conducive (quiet, dark, comfortable temperature and with electronic devices away), avoiding caffeine, smoking or heavy meal before going to bed as well as being physically active and exposing to sunlight during the day as it alters the circadian rhythms and raises the melatonin production which helps in sleep (American Sleep Association, 2016; Karami, et al., 2016). Additionally, relaxation techniques like massaging, listening to music and the use of guided imaginary can be taught to elderly to improve their quality of sleep. Teaching the elderly or caretakers to keep a sleep diary would help the trace the sleep habits and patterns in order to identify and monitor the sleep problems.

Furthermore, strategies to improve psychological wellbeing could be promoted. Elderly are encouraged to connect with people around and have more interactions, be active to engage in more activities and to keep learning as learning offers sense of achievement and helps in building confidence (National Health Service, 2016). Assisted living facilities are recommended to organise more activities for the elderly to take participation, so their time could be fulfilled with the activities they enjoy. Psychotherapy or psychological counselling services shall be provided to those in need to guide the management of sleep and mood disorders in institutions.

6.3. GAPS IN THE EVIDENCE

This study provided the understanding of association between sleep quality and depression among elderly in assisted living. However, the aspect of feelings of participants was not being looked into and this could affect the outcome of study. Mixed method which involves quantitative and qualitative studies to yield greater strength of evidence is suggested. The mechanisms underlying sleep and depression pathways were lacking as only the association between sleep quality and depression was determined.

6.4. IMPLICATION FOR FUTURE RESEARCH

With the association between sleep quality and depression found among elderly in assisted living facilities in this study, it can be used as evidence-based information for future research to work in the area to clarify the causal relationship between sleep quality and depression among elderly and other areas like the determinants of poor sleep quality and depression among elderly, development of new therapies for poor sleep quality and depression as well as the evaluation of effectiveness of treatments with regard to sleep problems and depression among elderly.

6.5. RECOMMENDATION

Future studies are recommended to include multi-ethnic participants to improve the generalisation to represent the whole population of Malaysia. Instead of convenience sampling, stratified random sampling is suggested, so that

participants with homogenous characteristics could be recruited and the result could represent the findings of every assisted living facility included in the study. Moreover, objective measure of sleep quality such as Actigraphy is recommended to provide more accurate information in order to determine the sleep quality status among elderly. Common confounding factors for both perceived sleep quality and depression shall be taken into consideration and analyses exploring the shared confounding factors for both variables are suggested. Lastly, future investigations are recommended to select cohort study to follow up on participants to better understand the causality between sleep quality and depression among elderly.

6.6. CONCLUSION

The prevalence of poor sleep quality among elderly in assisted living facilities was high as 65.3% while the prevalence of depression was only 31%. No association was found between sleep quality and selected sociodemographic variables (age, gender, marital status, educational level and length of stay) among elderly. However, there was significant association found between sleep quality and depression among elderly. Elderly with poor sleep quality are more likely to have depression. All the sleep PSQI components, except for the use of sleeping medication, were positively correlated with depression. The strength of correlation with depression was the strongest in sleep latency while the weakest in sleep disturbances. Importance of good sleep quality among elderly shall be highlighted and appropriate interventions shall be taken to promote better sleep quality and psychological wellbeing among elderly.

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APPENDIXES

APPENDIX A: CONSENT DECLARATION FORM

Page 1 of 2

INFORMATION SHEET AND CONSENT FORM

Project Title: “Relationship between Sleep Quality and Depression among Elderly in Assisted Living Facilities within Klang Valley” by the following researcher:

Shierly Yap Siong Wan

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Contact person: Shierly Yap Siong Wan; Phone: 016-9179863; E-mail: winzyap123@hotmail.com:

Purpose of the study:

This project is an attempt to gather important information about *identifying the relationship between sleep quality and depression among elderly in assisted living facilities within Klang Valley*.

The main intention behind this project is **not** to **identify** any **individual's** response, but **group** responses. Your participation in this study is very important as it would help the researcher to better understand the relationship between sleep quality and depression among elderly in assisted living facilities within Klang Valley. There is **no right** or **wrong** answers to the questions asked or the statements made; instead, what is desired of you is your **truthful** and **honest** response.

We are asking you to share with us some very personal and confidential information, and you may feel uncomfortable talking about some of the topics. You do not have to answer any question or take part in the discussion/interview/survey if you don't wish to do so, and that is also fine. You do not have to give us any reason for not responding to any question, or for refusing to take part in the interview or other tests.

Overview of Procedure:

This research will consist of the following:

1. A questionnaire that records your (a) general demographic information, (b) medical problems (if any), (c) questions to test sleep quality, (d) questions to screen for depression.

The time needed to complete the questionnaire is **approximately 15-20 minutes**.

Questionnaire will be completed by the elderly with the assistance provided by the researcher.

Duration:

The research will takes place for over half a year. During that time, we will visit you in quarterly interval to do repeat assessment, and such subsequent sessions will not last longer than 30 minutes.

Participation:

You have been chosen to be part of this study as you meet the project's pre-set criteria of 'living in an aged care facility', and because we feel you can contribute much to our understanding and knowledge of problems in the elderly. Nevertheless, please note that the participation in this research project is entirely **voluntary** and you may choose to withdraw from this study at any point of time without having to state any reason for doing so.

Page 1 of 2

INFORMATION SHEET AND CONSENT FORM

Benefits and Risks:

There will be no direct benefit to you, but your participation is likely to help us find out more about problems faced by elderly individuals living in care facilities. You will not be provided any incentive to take part in the research, however we will be able to provide a brief report of the measurements we do; which indirectly reflects on your health status.

We will take utmost care to ensure your safety at all times during the interview process and during the conduct tests/measures mentioned earlier. Nevertheless, in the event of an unexpected injury during your participation or in the course of the study or whether or not as a direct result of this study, UTAR will not be liable for any loss or damage or compensation or absorb the costs of medical treatment. However, assistance will be provided to you in obtaining emergency medical treatment.

Confidentiality:

All information gathered as a result of your participating in this study will be treated with utmost confidentiality. All details that can identify you will be removed before storing the data, and before the results of this study can be published.

Thank you for taking the time to read this information sheet and consent form.

Please sign this consent form to express your agreement to participate in this project.

Consent form: (Please tick (✓) the appropriate boxes)

I have read (or has been read to me) and understood the foregoing project information sheet dated _____. (dd/mm/yyyy). ☐

I have had the opportunity to ask questions about it and any questions I had were answered to my satisfaction. ☐

I consent voluntarily to take part in the project. Taking part in the project will include completing a questionnaire and certain measurements/tests listed above, mentioned in the section "procedure". I understand that I can withdraw from the study at any time and I will not be asked any questions about why I no longer want to take part. ☐

I understand my personal details will not be revealed to people outside the project. ☐

I understand that my words may be quoted in publications, reports, web pages, and other research outputs but my name (identity) will not be revealed unless I consent for it. ☐

I understand that other researchers will have access to this data only if they agree to preserve the confidentiality of that data and if they agree to the terms I have specified in this form. ☐

I understand that other researchers may use my words in publications, reports, web pages, and other research outputs according to the terms I have specified in this form. ☐

I agree to assign the copyright I hold in any materials related to this project to Shierly Yap Siong Wan who is the Principal Investigators of this research study. ☐

Name of Participant

Signature

Date

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

Name of Researcher/person taking consent

Signature

Date

Name of Witness (in case of illiterate participant)

Signature

Date

APPENDIX B: QUANTITATIVE ASSESSMENT TOOL

Quantitative Assessment Tool

This study is to determine the relationship between sleep quality and depression among elderly in assisted living facilities within Klang Valley. The questionnaire is divided into Section A, Section B and Section C. Participants are required to complete all the questions provided.

Instruction: Please fill up the details & tick (✓) in one of the box ☐ given.

Section A: Sociodemographic Questionnaire

1. Age: _____

2. Gender:

☐

Male

☐

Female

3. Marital Status:

☐

Single

☐

Married

☐

Widowed

☐

Divorced

4. Educational Level:

☐

None

☐

Primary

☐

Secondary

☐

Tertiary

5. Length of stay in assisted living facilities: _____

Section B: Pittsburgh Sleep Quality Index (PSQI)

Name _____

Date _____

Sleep Quality Assessment (PSQI)

What is PSQI, and what is it measuring?

The Pittsburgh Sleep Quality Index (PSQI) is an effective instrument used to measure the quality and patterns of sleep in adults. It differentiates “poor” from “good” sleep quality by measuring seven areas (components): subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications, and daytime dysfunction over the last month.

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 month. 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. What time have you usually gotten up in the morning? _____
4. A. How many hours of actual sleep did you get at night? _____
B. How many hours were you in bed? _____

5. During the past month, how often have you had trouble sleeping because you	Not during the past month (0)	Less than once a week (1)	Once or twice a week (2)	Three or more times a week (3)
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 comfortably				
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?				
9. During the past month, how would you rate your sleep quality overall?	Very good (0)	Fairly good (1)	Fairly bad (2)	Very bad (3)

Scoring

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

Add the seven component scores together _____ Global PSQI _____

A total score of "5" or greater is indicative of poor sleep quality.

If you scored "5" or more it is suggested that you discuss your sleep habits with a healthcare provider

Section C: Geriatric Depression Scale (GDS) – Short Form

Geriatric Depression Scale (Short Form)

Patient's Name: _____ Date: _____

Instructions: Choose the best answer for how you felt over the past week.

No.	Question	Answer	Score
1.	Are you basically satisfied with your life?	YES / NO	
2.	Have you dropped many of your activities and interests?	YES / NO	
3.	Do you feel that your life is empty?	YES / NO	
4.	Do you often get bored?	YES / NO	
5.	Are you in good spirits most of the time?	YES / NO	
6.	Are you afraid that something bad is going to happen to you?	YES / NO	
7.	Do you feel happy most of the time?	YES / NO	
8.	Do you often feel helpless?	YES / NO	
9.	Do you prefer to stay at home, rather than going out and doing new things?	YES / NO	
10.	Do you feel you have more problems with memory than most?	YES / NO	
11.	Do you think it is wonderful to be alive?	YES / NO	
12.	Do you feel pretty worthless the way you are now?	YES / NO	
13.	Do you feel full of energy?	YES / NO	
14.	Do you feel that your situation is hopeless?	YES / NO	
15.	Do you think that most people are better off than you are?	YES / NO	
TOTAL			

Scoring:

Assign one point for each of these answers:

- | | | | | |
|--------|--------|--------|---------|---------|
| 1. No | 4. YES | 7. No | 10. YES | 13. No |
| 2. YES | 5. No | 8. YES | 11. No | 14. YES |
| 3. YES | 6. YES | 9. YES | 12. YES | 15. YES |

A score of 0 to 5 is normal. A score above 5 suggests depression.

Source:

- Yesavage J.A., Brink T.L., Rose T.L. et al. Development and validation of a geriatric depression screening scale: a preliminary report. J. Psychiatr. Res. 1983; 17:37-49.

METHOD TO CALCULATE THE SCORE OF EACH COMPONENT IN PSQI

1. Component 1: Subjective sleep quality

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

Response	Score
“Very good”	0
“Fairly good”	1
“Fairly bad”	2
“Very bad”	3

Component 1 score: _____

2. Component 2: Sleep latency

- a. How long (in minutes) has it takes you to fall asleep each night?

Response	Score
≤ 15 minutes	0
16-30 minutes	1
31-60 minutes	2
> 60 minutes	3

- b. During the past month, how often have you had trouble sleeping because you cannot get to sleep within 30 minutes

Response	Score
Not during the past month	0
Less than once a week	1
Once or twice a week	2
Three or more times a week	3

Scoring for sleep latency:

Step 1: Add 2a score and 2b score = Sum of 2a & 2b

Step 2: Assign component 2 score as follows:

Sum #2a - 2b	Component 2 score
0	0
1 – 2	1
3 - 4	2
5 – 6	3

Component 2 score: _____

3. Component 3: Sleep duration

- a. During the past month, how many hours of actual sleep did you get at night?
(This may be different than the number of hours you spend in bed.)

Response	Score
> 7 hours	0
6-7 hours	1
5-6 hours	2
< 5 hours	3

Component 3 score: _____

4. Component 4: Habitual sleep efficiency

- a. During the past month, when have you usually gotten up in the morning?
Usual Getting Up Time: _____
- b. During the past month, when have you usually gone to bed at night?
Usual Bed Time: _____

Step 1: write in the number of hours slept (actual sleep #3a) =

Step 2: calculate the number of time spend in bed= Getting up time (PSQI #4a)
– Bedtime (PSQI # 4b) =

Step 3: Calculate habitual sleep efficiency= number of hours for actual sleep /
number of hours spent in bed x 100 = habitual sleep efficiency (%)

Habitual sleep efficiency (%)	Score
>85%	0
75-84 %	1
65-74%	2
<65%	3

Component 4 score: _____

5. Component 5: Sleep disturbances

Part	During the past month, how often have you had trouble sleeping because you	Not during the past month (0)	Less than once a week (1)	Once or twice a week (2)	Three or more times a week (3)
A	Wake up in the middle of the night or early morning				

B	Have to get up to use the bathroom				
C	Cannot breathe comfortably				
D	Coughing or snore loudly				
E	Feel too cold				
F	Feel too hot				
G	Had bad dreams				
H	Have pain				
I	Other reason(s), please describe, including how often you had trouble sleeping because of this reason(s)				

Scoring on component 5 (sleep disturbance):

Step 1: Add the scores for questions # 5a – 5i:

Step 2: assign sleep disturbance score as follows:

Sum #5a - 5i	Component 5 score
0	0
1 – 9	1
10 - 18	2
19 - 27	3

Component 5 score: _____

6. Component 6: Use of sleeping medication

During the past month, how often have you taken medicine (Prescribed or “over the counter”) to help you sleep?

Response	Component 6 score
Not during the past month	0
Less than once a week	1
Once or twice a week	2
Three or more times a week	3

Component 6 score: _____

7. Component 7: Daytime dysfunction

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

Response	Score
Never	0
Once or twice	1
Once or twice each week	2
Three or more times each week	3

- b. During the past month, how much of a problem has it been for you to keep up enthusiasm to get things done?

Response	Score
Never	0
Once or twice	1
Once or twice each week	2
Three or more times each week	3

Scoring for Daytime dysfunction:

Step 1: Add 7a score and 7b score = Sum of 7a & 7b

Step 2: Assign component 7 score as follows:

Sum #7a - 7b	Component 7 score
0	0
1 – 2	1
3 - 4	2
5 - 6	3

Component 7 score: _____

Global PSQI Score:

Add the seven component scores together: _____

.

APPENDIX C: QUANTITATIVE ASSESSMENT TOOL (CHINESE)

睡眠品質与老年忧郁调查问卷

这项调查问卷是要了解聚住在巴生谷内生活辅助设施的老人的睡眠品質与老年忧郁的关系。这项调查问卷分为部分 A，部分 B 与及部分 C。参与者必须完成所有在问卷内的问题。

指示：请填写所需的资料和在提供的格子内 ☐ 打个勾(✓)。

部分 A: 私人资料

1. 年龄: _____

2. 性别:

☐ 男

☐ 女

3. 婚姻状态:

☐ 单身

☐ 已婚

☐ 寡妇

☐ 离婚

4. 学历等级:

☐ 没有

☐ 小学

☐ 中学

☐ 大学

5. 您在生活辅助设施逗留了多久: _____

部分 B：匹茲堡睡眠品質量表

匹茲堡睡眠品質量表

說明：下列問題是要調查您過去這一個月來的睡眠習慣，請您以平均狀況回答。

1. 過去一個月來，您晚上通常幾點上床睡覺？_____點_____分
2. 過去一個月來，您在上床後，通常躺多久才能入睡？_____分
3. 過去一個月來，您早上通常幾點起床？_____點_____分
4. 過去一個月來，您每天晚上真正睡著的時間約多少（這可能和您躺在床上所花的時間不同）？_____小時_____分

下列問題請選擇最適合您的答案，在適合的選項內打勾，並回答所有問題。

5. 過去一個月來，您的睡眠有多少次受到下列干擾？	從未發生	每週少於 1 次	每週 1-2 次	每週 3 次 或以上
a. 無法在 30 分鐘入睡				
b. 半夜或清晨醒來				
c. 需要起床上廁所				
d. 呼吸不順暢				
e. 咳嗽或大聲打鼾				
f. 感覺很冷				
g. 感覺很熱				
h. 作惡夢				
i. 疼痛				
j. 其他情況請說明：_____				
6. 過去一個月來，您有多少次需要藉助藥物（醫師處方或成藥）來幫助睡眠？				
7. 過去一個月來，當您在開車、用餐、從事日常社交活動時，有多少次覺得難以保持清醒狀態？				
	完全沒有 困擾	只有很少 困擾	有些困擾	有很大的 困擾
8. 過去一個月來，要打起精神來完成您應該做的事情對您有多少困擾？				
	非常好	好	不好	非常不好
9. 過去一個月來，您對您自己的睡眠品質整體評價如何？				
總得分				

Buysse, D. J., Reynolds, C. F., Monk, T. H., Berman, S. K., & Kupfer, D. J. (1989). The Pittsburgh sleep quality index (PSQI): A new instrument for psychiatric research and practice. *Psychiatry Research*, 28(2), 193-213.

部分 C：老年抑郁量表

Australian Chinese version of the Standard GDS-15

	Items	Answer	
1.	Are you basically satisfied with your life? 你对自己的生活基本上满意吗？ 你對自己的生活基本上滿意嗎？	Yes 是	No 否
2.	Have you dropped many of your activities and interests? 你是否已放弃了自己的很多活动和兴趣？ 你是否已放棄了自己的很多活動和興趣？	Yes 是	No 否
3.	Do you feel that your life is empty? 你是否觉得生活空虚？ 你是否覺得生活空虛？	Yes 是	No 否
4.	Do you often get bored? 你是否常常感到无聊？ 你是否常常感到無聊？	Yes 是	No 否
5.	Are you in good spirits most of the time? 你是否常常感到精神不错，精神还可以？ 你是否常常感到精神不錯，精神還可以？	Yes 是	No 否
6.	Are you afraid that something bad is going to happen to you? 你是否害怕会有不好的事情发生在你身上呢？ 你是否害怕會有不好的事情發生在你身上呢？	Yes 是	No 否
7.	Do you feel happy most of the time? 你大部分时间心情还可以吗？ 你大部分時間心情還可以嗎？	Yes 是	No 否
8.	Do you often feel helpless? 你是否经常觉得无助？ 你是否經常覺得無助？	Yes 是	No 否
9.	Do you prefer to stay at home, rather than going out and doing new things? 你是否宁愿留在家裏，而不外出并做些新的事呢？ 你是否寧願留在家裏，而不外出並做些新的事呢？	Yes 是	No 否
10.	Do you feel you have more problems with memory than most? 你是否觉得你的记忆力比多数人差？ 你是否覺得你的記憶力比多數人差？	Yes 是	No 否
11.	Do you think it is wonderful to be alive now? 你是否觉得活着真好，活着还不错？ 你是否覺得活著真好，活著還不錯？	Yes 是	No 否
12.	Do you feel pretty worthless the way you are now? 你是否觉得自己现在很没用呢？ 你是否覺得自己現在很沒用呢？	Yes 是	No 否
13.	Do you feel full of energy? 你是否感到精力充足，精力足够应付日常的生活？ 你是否感到精力充足，精力足夠應付日常的生活？	Yes 是	No 否
14.	Do you feel that your situation is hopeless? 你是否觉得自己的处境没有希望？ 你是否覺得自己的處境沒有希望？	Yes 是	No 否
15.	Do you think that most people are better off than you are? 你是否觉得多数人都比你活得好吗？ 你是否覺得多數人都比你活得好嗎？	Yes 是	No 否

Validated by,

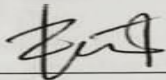


(Lee Siew Keah)

Dr. Lee Siew Keah
Assistant Professor
Department of Pre-clinical Sciences
Faculty of Medicine and Health Sciences
Universiti Tunku Abdul Rahman

Date: 1 June 2018

Validated by,



(Ng SiowFam)

Ms. Ng SiowFam
Lecturer
Department of Nursing
Faculty of Medicine and Health Sciences
Universiti Tunku Abdul Rahman

Date: 4/6/2018

APPENDIX D: ETHICAL APPROVAL APPLICATION FORM

UNIVERSITI TUNKU ABDUL RAHMAN			
Form Title : APPLICATION FOR ETHICAL CLEARANCE TO INVOLVE HUMAN SUBJECTS IN RESEARCH			
Form Number : FM-IPSR-R&D-056	Rev No : 1	Effective Date: 19/10/2015	Page No : 1 of 8

Application No.
(Official use only)

PRINCIPAL INVESTIGATOR/SUPERVISOR (FOR STUDENT'S PROJECT)			
Full Name	:	Liew Siew Fun	
Chinese character <i>(if applicable)</i>	:		
Staff No.	:	10220	
New Identity Card / Passport No.	:	740501-08-5596	
Designation	:	Lecturer cum Head of Department	
Qualification(s)	:	Master in Nursing	Specialization : General Nursing
Faculty / Institute	:	FMHS	Department : Nursing
Institution Address	:	Universiti Tunku Abdul Rahman Sungai Long	
Telephone	:	Mobile Phone	: 6012-5956788
Fax	:	E-mail	: liewsf@utar.edu.my
STUDENT			
Full Name	:	Shierly Yap Siong Wan	
Student No.	:	15UMB05411	
New Identity Card / Passport No.	:	930331-14-6620	
Programme Name	:	Bachelor of Nursing (Hons)	
Faculty / Institute	:	Faculty of Medicine and Health Sciences	
Mobile Phone	:	016-9179863	
E-mail	:	winzyap123@hotmail.com	
PROPOSED RESEARCH PROJECT			
1. Title of proposed research project: Relationship between sleep quality and depression among elderly in assisted living facilities within Klang Valley.			
2. Objectives of the research: - To determine the sleep quality status among elderly in assisted living facilities. - To determine the association between sleep quality and depression among elderly in assisted living facilities. - To determine association between selected sociodemographic variables and depression.			
3. Location of the research: Elderly assisted living facilities within Klang Valley.			

UNIVERSITI TUNKU ABDUL RAHMAN			
Form Title : APPLICATION FOR ETHICAL CLEARANCE TO INVOLVE HUMAN SUBJECTS IN RESEARCH			
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4. **Specific Outcomes and Expected Contribution of Study:** This study will provide awareness on the importance of having good sleep quality among elderly in assisted living facilities. Thus, to reduce the both the morbidity and mortality rates from depression and to improve quality of life among this group of citizens.

5. **Human Subject Involvement:** *Please tick appropriate box*

A. Questionnaires/ Interviews	☒
B. Clinical trials of drugs/ formulations	☐
C. Clinical trials of devices	☐
D. Use of human tissue samples	☐
E. Use of body fluids (e.g. blood)	☐
F. Human genetics research	☐
G. Others (please state) _____	

6. **Prior Review:**
Do you intend to submit or have you submitted this project to any other ethics committee(s)?

☐ YES ☒ NO

Name of ethics committee :

If yes, please provide details :

7. **Possible risks / discomforts to subjects/ patients or volunteers:** No risks and discomforts for participants.

8. **What are the direct or potential benefits (e.g. medical and financial) to participant?**
This study will provide awareness on the importance of having good sleep quality among elderly in assisted living facilities. Thus, to reduce the both the morbidity and mortality rates from depression and to improve quality of life among this group of citizens.

9. **What are the potential benefits to humanity?**
It brings awareness towards the community that elderly deserve the needs and cares in physical, social and mental aspects, especially those who are living assisted living facilities.

UNIVERSITI TUNKU ABDUL RAHMAN			
Form Title : APPLICATION FOR ETHICAL CLEARANCE TO INVOLVE HUMAN SUBJECTS IN RESEARCH			
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10. If the research is conducted together with other researchers, please state:
(Details of co-researcher(s))

	Name	Identity Card No*	Faculty / Institution	Signature
a.				
b.				
c.				
d.				
e.				

* Passport No. for Foreign Researcher

11. Name of other relevant external parties involved (if any):

	Name	Identity Card No.	Faculty / Institution	Signature
a.				
b.				
c.				
d.				
e.				

* Passport No. for Foreign Researcher

12. Who will be responsible for research related costs?

Researcher

For sponsored research, list thoroughly the costs that will be borne by the sponsor.

--

13. PROTOCOL CHECKLIST

13.1 Purpose of the study:

13.1.1 State concisely what are the specific objectives of the research?

- To determine the sleep quality status among elderly in assisted living facilities.
- To determine the association between sleep quality and depression among elderly in assisted living facilities.
- To determine association between selected sociodemographic variables and depression.

13.2 Background:

UNIVERSITI TUNKU ABDUL RAHMAN			
Form Title : APPLICATION FOR ETHICAL CLEARANCE TO INVOLVE HUMAN SUBJECTS IN RESEARCH			
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13.2.1	Describe the background of the study. <i>Prevalence of poor sleep quality among people who aged 60 and above is high, especially in assisted living facilities. Association was found between poor sleep quality and depression but the relationship remain complex. Both are often being overlooked and under-diagnosed.</i>
13.2.2	State concisely the importance of the research described in this application. <i>No study on this relationship has been done in assisted living facilities in Malaysia. This research provides awareness on the importance of having good sleep quality among elderly in assisted living facilities. Thus, to reduce the both the morbidity and mortality rates from depression and to improve quality of life among this group of citizens.</i>
13.3	Preliminary Studies / Progress Reports:
13.3.1	Provide the report for the preliminary studies (if any) pertinent to the application. <i>Not applicable.</i>
13.4	Methodology
13.4.1	Briefly describe the study design (e.g. randomized, double blind, cross over, phase III) <i>A quantitative descriptive correlational design.</i>
13.4.2	Describe sequentially all procedures, interventions and evaluations to be applied to subjects, and identify any that are experimental or performed exclusively for research purposes. <i>Not relevant.</i>
13.4.3	Indicate who will carry out the research procedures. Describe where the research will be conducted. <i>Researcher will carry out the procedures in elderly assisted living facilities within Klang Valley.</i>
13.4.4	Include details on sample size calculation and the statistical methods used to analyse the data. <i>Convenience sampling method.</i>
13.4.5	List all trial related procedures. Please also describe the subject research visits (frequency and procedures involved). For studies with multiple visits, please attach visit schedule. <i>Pilot study will be done before actual study on 27 elderly.</i>
13.4.6	Discuss the potential difficulties and limitations of the proposed procedures and alternative approaches to achieve the aims. <i>Expected limitations: Communication difficulty with different dialects.</i>
13.4.7	Describe the anticipated benefits and risks to human subjects participating in this research. <i>Benefits: Increase awareness to the community to improve quality of life among this group of citizens. No risks.</i>
Notes: Drawing of body fluids from volunteer can only be carried out by qualified doctor or nurse	
13.5	Additional Information on Methodology: (Please tick appropriate box)
☐ 13.5.1	If research involves databases, please complete the following: 13.5.1.1 Storage location of the research data, consent forms and personal data <i>All the research data, consent forms, personal data will be stored and locked in a drawer.</i> 13.5.1.2 Who will have access to the data? <i>Researcher.</i> 13.5.1.3 Mode of disposal of data after completion of project. <i>Questionnaire will be shredded and the computer data will be erased.</i> 13.5.1.4 Mode of disposal of consent forms after completion of project. <i>Consent forms will be shredded. The personal data protection form will be kept for the use of UTAR and submit to SERC.</i>
☐ 13.5.2	If research involves placebo, please complete the following: 13.5.2.1 Explain what "standard of care" therapy is available for this condition 13.5.2.2 Discuss the ethical implications of using placebo instead of "standard of care" therapy in this situation

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	13.5.2.3	Address the issues of safety and efficacy of other available therapies
	13.5.2.4	The total duration the subject would be on placebo arm of the research
	13.5.2.5	Greatest potential harm that the subject might be exposed to as a result of not receiving effective therapy
	13.5.2.6	Protocol in place to safeguard participants receiving placebo
☐	13.5.3	If research involves tissues / body fluids, please complete the following:
	13.5.3.1	Describe the samples that will be collected and stored?
	13.5.3.2	What tests will be performed on these samples?
	13.5.3.3	What will happen to the tissues after the research is completed?
	13.5.3.4	Will results from the tests be communicated to the subjects?
☐	13.5.4	If research involves cell cultures / cell lines, please complete the following:
	13.5.4.1	Describe the cells that will be used for the research.
	13.5.4.2	Indicate the source of the cell cultures/lines. Please provide proof of purchase or catalog details of the cells.
14. CHARACTERISTICS OF VOLUNTEERS		
14.1	Provide the maximum number of subjects you seek approval to enroll from the entire subject populations you intend to use and justify the sample size.	
14.2	Lower Age Limit: 60 years old Upper Age Limit: 90 years old	
14.3	Are there any subject recruitment restrictions based on race of the subject? No	
14.4	Inclusion criteria: (Please tick appropriate box)	
	☐ Healthy Volunteers	☐ Outpatients ☐ Inpatients
	☐ Children	☐ Pregnant Women
	☐ Incompetent Patients (Please specify)	
	☒ Others (Please specify) Participants who aged 60 years old and above, are able to communicate and agree to give consent in participation.	
14.5	Exclusion criteria Those who are below 60 years old, elderly who are unable to communicate, living in the assisted living facilities less than 3 months, with cognitive impairment, mental illness and refuse to participate.	
15. Attach the following with this application form:		
15.1	Biodata of the applicant and any co-researcher(s).	

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15.2 List of previous research
Indicate the research in relation to this project with an asterisk ().*

16. INDEMNITY

I shall indemnify, defend and hold harmless UTAR from any or all claims, demands, losses, damages, costs and liabilities made by any third party due to or arising out of any acts, omission or negligence in carrying out this study.

17. DECLARATION

- a) I will not initiate this research until I receive written approval from the UTAR Scientific & Ethical Review Committee and the regulatory authority or otherwise relevant authorities (if applicable).
- b) I will not initiate any changes in protocol without prior written approval from UTAR Scientific and Ethical Review Committee except when it is necessary to reduce or eliminate risk to the subject.
- c) I will promptly report any unexpected or serious adverse events, unanticipated problems or incidents that may occur in the course of this research.
- d) I will take all necessary steps to maintain confidentiality of all information, samples and specimens about the volunteers. Data, samples and specimen obtained will be stored securely and will be made available only to the Principal Investigator and the research team, the UTAR Scientific and Ethical Review Committee, the sponsor and the regulatory authorities for the purpose of verifying the research procedures info and/or data
- e) I declare that the name and other facts that might identify the volunteer will not appear when this study is presented or its results are published
- f) I declare that there is no existing or potential conflict of interest for any of the investigators participating in this research.
- g) I have read and understood, and hereby accept and agree to abide by UTAR Research Ethics & Code of Conduct and any applicable UTAR's Guidelines. I undertake that the information I have provided herein is complete and accurate and I agree to carry out the Project in accordance with the terms in the International Conference of Harmonization of Good Clinical Practice Guidelines. My involvement in this Project does not conflict with my University duties and I have no other conflict of interest to declare
- h) I further agree that I shall abide by all instructions and directions issued by UTAR pertaining to all aspects of the research herein including but not restricted to suspending and ceasing of the research herein.

Remarks (if any) :

Principal Investigator/Supervisor
Signature

Date

Name of Principal Investigator/
Supervisor : _____

RECOMMENDATION BY DEAN

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<i>Recommended / Not Recommended for Approval</i>	
Signature	Date
Name of Dean	
RECOMMENDATION BY UTAR SCIENTIFIC & ETHICAL REVIEW COMMITTEE	
Comments :	
UTAR Scientific & Ethical Review Committee :	Minutes No.
..... Signature of Secretary	
Name of Secretary:	
COMPLETED BY THE CHAIRMAN OF THE UTAR SCIENTIFIC & ETHICAL REVIEW COMMITTEE	
Approved subject to full review (of protocol, informed consent documents etc.)	
Signature of Chairman	Date:
Name of Chairman:	

RESUME

PERSONAL DATA

Name: **Shierly Yap Siong Wan**
Age: 24 years old
Religion: Buddhist Chinese
Address: D3-12-3A, Scotpine Condominium
Bandar Sungai Long, 43000 Kajang Selangor
HP. No: 016-9179863
E-mail : winzyap123@hotmail.com



EDUCATION

Sekolah Menengah Kebangsaan Taman Selayang — SPM achiever
Jan 2005 - Dec 2010
Sekolah Menengah Kebangsaan Darul Ehsan — STPM achiever
May 2011 - Dec 2012
Universiti Tunku Abdul Rahman, Sungai Long Campus — Bachelor of Nursing
(Hons) (currently)
May 2015 - May 2019
Gaining knowledge and information in nursing.

EXPERIENCE

Vycon Pharmacy, Sri Gombak — Full-time *Pharmacy assistant*
March 2013 – March 2014
Working as full-timer to gain experience.
Gaining experience to communicate with customers in providing information
towards the product that are sold in the retail.

RESEARCH PROPOSAL

Relationship between sleep quality and depression among elderly in assisted living
facilities, Klang Valley.
To determine the relationship between sleep quality and depression among elderly
in assisted living facilities, Klang Valley.

SKILLS

- Possess a skill in using Microsoft Word, PowerPoint and Excel.
- Possess a fine communication skills.

PERSONAL STRENGTH

- Willing to learn.
- Able to cope with new environment.
- Patient and hardworking

LANGUAGES

Able to speak fluent English, Chinese and Bahasa Malaysia.

APPENDIX E: ETHICAL CLEARANCE APPROVAL LETTER



UNIVERSITI TUNKU ABDUL RAHMAN

Wholly Owned by UTAR Education Foundation (Company No. 578227-M)

Re: U/SERC/15/2018

24 January 2018

Ms Liew Siew Fun
Head, Department of Nursing
Faculty of Medicine and Health Sciences
Universiti Tunku Abdul Rahman
Jalan Sungai Long
Bandar Sungai Long
43000 Kajang
Selangor

Dear Ms Liew,

Ethical Approval For Research Project/Protocol

We refer to your application dated 22 January 2018 for ethical approval for your students' research projects from Bachelor of Nursing (Hons) programme enrolled in course UMNB4024. We are pleased to inform you that the application has been approved under expedited review.

The details of the approval are as follows:

No	Research Title	Student's Name	Supervisor's Name	Approval Validity
1.	Relationship between Sleep Quality and Depression Among Elderly in Assisted Living Facilities within Klang Valley	Shierly Yap Siong Wan	Ms Liew Siew Fun	24 January 2018 – 23 January 2018
2.	The Relationship of Sleep Quality on Cognitive Performance Among Institutionalised Elderly within Klang Valley	Ooi Man Thing	Co-supervisor: Ms Sheela Devi	
3.	Prevalence of Urinary Incontinence and Its Impact on Quality of Life Among Elderly Female in Long-term Care Facilities	Eunice Ho Yin Yee	Ms Choo Peak Yean	
4.	Prevalence of Urinary Incontinence and Its Association with Depression Among Elderly Female in Assisted Living Facilities	Ong Hui Yuan	Co-supervisor: Ms Magesvary Maruthiah	
5.	Relationship between Oral Health and Nutritional Status Among Elderly in Long-term Care Facilities in Klang Valley	Ong Wei Xin	Ms Woo Li Fong	
6.	Relationship between Nutritional Status and Activities Daily Living (ADLs) Among Elderly in Long-term Care Facilities in Klang Valley	Chung Shun Pei	Co-supervisor: Ms Shamala Baskaran	

Address: Jalan Sg. Long, Bandar Sg. Long, Cheras, 43000 Kajang, Selangor D.E. Postal Address: P O Box 11384, 50744 Kuala Lumpur, Malaysia
Tel: (603) 9086 0288 Fax: (603) 9019 8868 Homepage: <http://www.utar.edu.my>

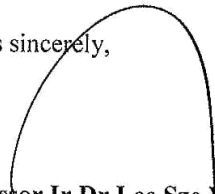
The conduct of this research is subject to the following:

- (1) The participants' informed consent be obtained prior to the commencement of the research;
- (2) Confidentiality of participants' personal data must be maintained; and
- (3) Compliance with procedures set out in related policies of UTAR such as the UTAR Research Ethics and Code of Conduct, Code of Practice for Research Involving Humans and other related policies/guidelines.

Should the students collect personal data of participants in their studies, please have the participants sign the attached Personal Data Protection Statement for records.

Thank you.

Yours sincerely,

A handwritten signature in black ink, consisting of a large, stylized loop that starts from the left, goes up and over, and then comes down to the right, ending near the text below.

Professor Ir Dr Lee Sze Wei
Chairman
UTAR Scientific and Ethical Review Committee

c.c Dean, Faculty of Medicine and Health Sciences
 Director, Institute of Postgraduate Studies and Research

APPENDIX F: PERSONAL DATA PROTECTION STATEMENT

PERSONAL DATA PROTECTION STATEMENT

Please be informed that in accordance with Personal Data Protection Act 2010 ("PDPA") which came into force on 15 November 2013, Universiti Tunku Abdul Rahman ("UTAR") is hereby bound to make notice and require consent in relation to collection, recording, storage, usage and retention of personal information.

Notice:

1. The purposes for which your personal data may be used are inclusive but not limited to:-
 - For assessment of any application to UTAR
 - For processing any benefits and services
 - For communication purposes
 - For advertorial and news
 - For general administration and record purposes
 - For enhancing the value of education
 - For educational and related purposes consequential to UTAR
 - For the purpose of our corporate governance
 - For consideration as a guarantor for UTAR staff/ student applying for his/her scholarship/ study loan
2. Your personal data may be transferred and/or disclosed to third party and/or UTAR collaborative partners including but not limited to the respective and appointed outsourcing agents for purpose of fulfilling our obligations to you in respect of the purposes and all such other purposes that are related to the purposes and also in providing integrated services, maintaining and storing records. Your data may be shared when required by laws and when disclosure is necessary to comply with applicable laws.
3. Any personal information retained by UTAR shall be destroyed and/or deleted in accordance with our retention policy applicable for us in the event such information is no longer required.
4. UTAR is committed in ensuring the confidentiality, protection, security and accuracy of your personal information made available to us and it has been our ongoing strict policy to ensure that your personal information is accurate, complete, not misleading and updated. UTAR would also ensure that your personal data shall not be used for political and commercial purposes.

Consent:

1. By submitting this form you hereby authorise and consent to us processing (including disclosing) your personal data and any updates of your information, for the purposes and/or for any other purposes related to the purpose.
2. If you do not consent or subsequently withdraw your consent to the processing and disclosure of your personal data, UTAR will not be able to fulfill our obligations or to contact you or to assist you in respect of the purposes and/or for any other purposes related to the purpose.
3. You may access and update your personal data by writing to us at _____.

Acknowledgment of Notice

- [] I have been notified by you and that I hereby understood, consented and agreed per UTAR above notice.
- [] I disagree, my personal data will not be processed.

.....
Name:

Date:

APPENDIX G: GANTT CHART

	2017			2018											
	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	July	Aug	Sept			
Research proposal writing															
Research proposal presentation															
Ethics approval															
Pilot study															
Data collection															
Data analysis															
Results interpretation															
Report writing															
Presentation and thesis submission															

APPENDIX H: TURNITIN ORIGINALITY REPORT

Turnitin Originality Report

Processed on: 19-Sep-2018 17:46 +08

ID: 1004596934

Word Count: 11257

Submitted: 1

fyp By Shierly Yap

Similarity Index	Similarity by Source	
	Internet Sources:	12%
19%	Publications:	16%
	Student Papers:	5%

1% match (publications)

[Ki Jung Chang, Sang Joon Son, Yunhwan Lee, Joung Hwan Back et al. "Perceived sleep quality is associated with depression in a Korean elderly population", Archives of Gerontology and Geriatrics, 2014](#)

1% match (publications)

[Fatma Özlem Orhan. "Relationship between sleep quality and depression among elderly nursing home residents in Turkey", Sleep And Breathing, 11/27/2011](#)

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<http://www.ajan.com.au/Vol31/Issue4/1Kav.pdf>

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[Weerakorn Thichumpa, Nopporn Howteerakul, Nawarat Suwannapong, Visasiri Tantrakul. "Sleep quality and associated factors among the elderly living in rural Chiang Rai, northern Thailand", Epidemiology and Health, 2018](#)

< 1% match (publications)

[Örsal, Özlem, Güler Balcı Alparslan, Ayşe Özkaraman, and Neşe Sönmez. "The Effect of Relaxation Exercises on Quality of Sleep Among the Elderly : Holistic Nursing Practice Review Copy", Holistic Nursing Practice, 2014.](#)

< 1% match (student papers from 06-Jul-2017)

[Submitted to Penang Medical College on 2017-07-06](#)

< 1% match (Internet from 07-Sep-2017)