

CHAN CHI KUAN

IMPACT OF DAYTIME NAP ON THE RISK OF STROKE

2022

**PERCEPTION, KNOWLEDGE, AND
ATTITUDE ON THE IMPACT OF DAYTIME
NAP ON THE RISK OF STROKE AMONG
NON-HEALTHCARE UNDERGRADUATE
STUDENTS**

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DECEMBER 2022

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IMPACT OF DAYTIME NAP ON THE RISK OF STROKE
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By

CHAN CHI KUAN

A Research project submitted to the Department of Physiotherapy,
M. Kandiah Faculty of Medicine and Health Sciences,
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in partial fulfillment of the requirements for the degree of Bachelor of
Physiotherapy (HONOURS)

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PERCEPTION, KNOWLEDGE, AND ATTITUDE ON THE IMPACT OF DAYTIME NAP ON THE RISK OF STROKE AMONG NON-HEALTHCARE UNDERGRADUATE STUDENTS

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ABSTRACT

Background and Objective: Daytime napping refers to a short duration of sleep during the day and it is a common practice in most part of the world. However, several evidence show that daytime nap may be one of the risk factors for brain stroke, but limited studies were done to evaluate the perception, knowledge, and attitude of the society. Therefore, the objective of this research was to assess the perception, knowledge, and attitude on the impact of daytime nap on the risk of stroke among non-healthcare undergraduate students using self-administered questionnaire.

Methods: The sampling method used in the study was convenience sampling and a total of 400 participants were recruited for this study. A self-prepared questionnaire via an online platform with Cronbach's alpha value of 0.834 was used and communication platforms such as WhatsApp and Microsoft Teams were used to collect data. Descriptive and inferential analysis were used to analyze the data collected including the usage of Spearman's correlation test and Pearson Chi-Square test with IBM SPSS software statistics version 20.

Results: The total participants recruited were 400 participants but only 365 responses were included and processed due to 35 of the participants did not meet the inclusion criteria of this study. The average perception, knowledge, and attitude score of participants were 16.38 ± 2.11 , 6.90 ± 1.08 , and 11.49 ± 1.36 respectively. No significant correlation was found between perception and attitude, knowledge and attitude and BMI and practice of daytime nap among non-healthcare undergraduate students in UTAR Sungai Long campus.

Conclusion: In conclusion, the role of physiotherapists in the promotion of sleep health is undeniably crucial to raise the awareness and knowledge starting from the student community and gradually expanding to the general population by distributing pamphlets and organizing talks and workshops. This study concludes that the general population of non-healthcare undergraduate students in UTAR Sungai Long campus has an average perception, knowledge, and attitude towards the impact

of daytime nap on the risk of brain stroke. However, the result is not generalizable to the overall population in Malaysia. Therefore, further studies can be done involving a wider population.

Keywords: Daytime Nap, Stroke, Sleep, University students, Perception, Knowledge, Attitude

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APPROVAL SHEET

This Research project entitled **“PERCEPTION, KNOWLEDGE AND ATTITUDE ON THE IMPACT OF DAYTIME NAP ON THE RISK OF STROKE AMONG NON-HEALTHCARE UNDERGRADUATE STUDENTS”** was prepared by CHAN CHI KUAN and submitted as partial fulfilment of the requirements for the degree of Bachelor of Physiotherapy (HONOURS) at Universiti Tunku Abdul Rahman.

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PERMISSION SHEET

It is hereby certified that **CHAN CHI KUAN** (ID No: **19UMB01202**) has completed this Research project entitled “PERCEPTION, KNOWLEDGE AND ATTITUDE ON THE IMPACT OF DAYTIME NAP ON THE RISK OF STROKE AMONG NON-HEALTHCARE UNDERGRADUATE STUDENTS” under the supervision of MR TARUN AMALNERKER (Supervisor) from the Department of Physiotherapy, M. Kandiah Faculty of Medicine and Health Sciences.

Yours truly,

(CHAN CHI KUAN)

DECLARATION

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

Name: CHAN CHI KUAN

Date: 23 DECEMBER 2022

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LIST OF ABBREVIATIONS

REM	Rapid Eye Movement
NREM	Non-Rapid Eye Movement
EDS	Excessive Daytime Sleepiness
IH	Idiopathic Hypersomnia (IH)
KLS	Kleine-Levin Syndrome (KLS)
MSLT	Multiple Sleep Latency Test (MSLT)
NT1	Narcolepsy Type 1
NT2	Narcolepsy Type 2
EEG	Electroencephalogram
PAI	Plasminogen Activator Inhibitor
LAMF	Low-Amplitude Mixed-Frequency
CRP	C-Reactive Protein
BMI	Body Mass Index
UTAR	Universiti Tunku Abdul Rahman
FCI	Faculty of Creative Industries
FAM	Faculty of Accountancy and Management
LKC FES	Lee Kong Chian Faculty of Engineering and Sciences
SPSS	Statistical Package for Social Science
SD	Standard Deviation
p	P value (Significance)

CHAPTER 1

INTRODUCTION

1.1 Chapter overview

This chapter will outline the background of the study, providing context for the overall research project before proceeding to the importance and relevance, research objectives and operational definition of terms used for the research study.

1.2 Background of study

1.2.1 Sleep

According to the National Institute of Neurological Disorders and Stroke (2022), sleep is a part of the basic human physiological needs which is as crucial as food and water to survive. While the biology aspect on the role of sleep remains unclear, studies have found that sleep has influence on the brain, cardiovascular system, metabolism, immunity, and emotions. For instance, sleep regulates the transmission of brain signals and eliminate toxins that are accumulated while the body is in conscious state. Therefore, long term of sleep deprives, or poor sleep quality at night can result in higher risk of hypertension, heart disease, diabetes mellitus and psychological disorders such as depression.

When an individual sleeps, the body will undergo 2 different stages of sleep, namely non-rapid eye movement (NREM) and rapid eye movement (REM). Firstly, the NREM stage is further divided into 3 stages. According to Aakash et al., (2022), during the first stage of NREM which is light sleeping that usually lasts for about one to five minutes or 5% of total sleep time where eye movement and muscle activity begin to slow down. At this stage, beyond half of

the alpha waves in the brain are substituted with low-amplitude mixed-frequency (LAMF) activity. In this stage, individual will often experience hypnic jerk or hypnic myoclonic which is a feeling of fall due to sudden muscle contraction. In stage 2 where the individual will experience deeper sleep that usually lasts for about 25 minutes in the first cycle and increases with each cycle, making up approximately 45% of total sleep time with gradual decrease in body temperature and pulse rate. Aakash et al. (2022) has discovered that this is due to the presence of sleep spindles which are short and powerful bursts of neuron firing in the brain and K-complexes which are longest and most distinct long delta waves of about one second that are able to be traced by the electroencephalogram (EEG). At this stage, individual will often experience sleep bruxism where teeth grinding, or clenching may occur during sleep. Lastly, stage 3 is where individual will experience deepest NREM sleep, also known as slow wave sleep or deep sleep, which usually makes up 25% of total sleep time. It is the hardest to wake up someone in this stage of sleep as it is the deepest stage of sleep characterized by low frequency and high amplitude of delta waves in the brain recorded by the EEG. However, if someone is awakened at this stage, they may have sleep inertia and moderately decreased psychological performance for half an hour to an hour (Aakash et al., 2022). Therefore, Lawler (2021) states that it is recommended for an individual to nap for a maximum of 20 minutes just before the body enters deep sleep as waking up from light sleep would be easier than waking up from deep sleep. When an individual takes a nap for more than half an hour, the body starts to enter deep sleep and waking up would result in grogginess and drowsiness, also known as sleep inertia, when the body feels like more sleep is needed (Lawler, 2021).

On the other hand, Aakash et. al (2022) mentioned that during the stage of REM sleep, the brain waves occur to be the same as when one's awake which shows that the sleep here is less deep. However, voluntary muscles are temporarily paralyzed except the eyes and diaphragmatic breathing muscles remain active but respiratory rate often becomes irregular. This stage occurs after around 1.5 hours after falling asleep and each REM cycle increases with the first cycle being about 10 minutes long and last cycle up to an hour long. During REM stage, an individual may experience dreams, irregular muscle contractions, rapid eye movements, increase in oxygen consumption in the brain, increase in heart rate, increase in blood pressure, increase in acetylcholine levels, and increase in brain metabolism up to 20%. Pérez-Carbonell and Bashir (2020) stated that approximately quarter of brain stroke incidence onset during REM sleep due to the physiological changes that take place in the body causing thrombotic events.

1.2.2 Daytime Nap

Daytime nap is known and practiced in almost every part of the world, and it may be an important component in some individual's life. Daytime nap is a short period of sleep, usually 10 to 20 minutes, during the day (Fry, 2022). According to Fry (2022), there are mainly 5 types of nap, namely recovery nap, prophylactic nap, appetitive nap, fulfilment nap and essential nap where each serves a unique purpose. First, recovery nap refers to a daytime nap that one takes to compensate for the sleep deprivation that they experience the day before. Second, prophylactic nap refers to a daytime nap that one takes to prepare their body for sleep loss in advance. Prophylactic also means preventative. This is taken to prevent the body going into a fatigue state when one is forced to not sleep at night. For instance, people who work in night shifts are recommended to take a nap during the day to stay awake while working at night. Furthermore, appetitive nap is where a person takes a nap purely for enjoyment purpose such as relaxing their body, boosting their mood, and enhancing their energy level. Lastly, essential nap refers to a daytime nap taken due to higher demand of sleep when a person is sick or not feeling well. When the body rests, the body has more energy to support the immune system to fight against the infection and boost the healing process.

In addition, siesta, a common tradition in Mediterranean and Southern Europe, the Middle East, mainland China and the Indian subcontinent. Siesta is a Spanish word meaning "nap" and is generally practiced between 2pm to 5pm. Shoen (2022) mentioned that the advantages of siesta include reduce sleep debt and enhance cognitive performance. Sleep debt is the difference between amount of sleep required by the person and the amount of sleep they received. However,

the positive impact of siesta is highly dependent on the duration of nap taken where 10 to 20 minutes of siesta is suggested in the article. In contrast, Shoen (2022) also stated that duration of siesta of more than 30 minutes would result in sleep inertia and the possible adverse effects are increase in inflammation, risk of high blood pressure, risk of myocardial infarction and symptoms of depression. Poor sleep quality at night may increase one's sleep debt causing a person to feel tired or restless during the day. Statistics have shown that the prevalence of sleep disorders in Malaysia is 35% and 53% of the Malaysia population sleeps lesser than 7 hours in a day due to tight work schedule (Malek, 2020). Thus, one of the ways to replenish their energy to carry on with their daily activities is to take a nap in between (Kamal et al., 2012). In the study conducted by Lovato and Lack (2010), naps are found to be effective in reducing sleepiness and improving cognitive performance as insufficient sleep at night may lead to weak cognition and memory.

1.2.3 Brain Stroke

Brain stroke is a phenomenon that happens in the brain when the blood flow is blocked or disrupted due to ruptured blood vessels or presence of plaque and unable to reach a certain part of the brain leading to cell damage and cell death in minutes giving rise to brain necrosis (Holland, 2021). Blood is a medium that carries oxygen and nutrients and supply them to the whole body. When the blood flow is blocked or disturbed to a certain part of the body, the cells or body tissue in that area will not get sufficient supply of oxygen and nutrients to carry out cellular activities resulting in cell death. The two common type of brain stroke are ischemic stroke and haemorrhagic stroke. Ischemic stroke is when a blood clot flows to the blood vessels in the brain, blocking the blood supply to the brain cells causing cell death due to lack of oxygen and nutrients whereas haemorrhagic stroke is due to rupture of the blood vessels in the brain and the blood starts to flow out from the blood vessels into the brain causing accumulation of blood in the brain resulting in high pressure exerted on the brain cells causing damage.

The common well-known non-intrinsic risk factors of brain stroke are cardiovascular diseases, high blood pressure, diabetes mellitus, imbalance cholesterol level, obesity, smoking and physical inactivity (National Institute of Neurological Disorders and Stroke, 2022). However, several studies have discovered taking daytime nap can increase the risk of brain stroke as well and not many people are aware of this. Tan Sri Dr Noor Hisham Abdullah, the director general of health stated that the prevalence of brain stroke will strike up to 25% of the Malaysian population estimated based on the Global Burden of Disease Stroke Statistics Worldwide survey done in the year 2016 if no

preventative measures are taken (The Star, 2021). Caudwell et. al (2020) has stated that physiotherapists play an important role in promoting awareness and knowledge on sleep health and sleep disorders especially in the light of aging community in Malaysia where the incidence rate of many diseases associated with age may start to increase if the education of the society continue to be poor. Besides, Ganasegeran et al. (2020) stated that the prevalence of brain stroke has been increasing resulting it to be the top 3 cause of death and the top cause of disability in Malaysia. Thus, this study aims to determine the perception, knowledge and attitude on the impact of daytime nap on the risk of brain stroke as well among the targeted population which is non-healthcare undergraduate students in UTAR hoping to decrease the prevalence of brain stroke in Malaysia.

1.2.4 Concluding Remarks

In summary, this study was conducted to assess the perception, knowledge, and attitude on the impact of daytime nap on the risk of brain stroke among non-healthcare undergraduate students in UTAR Sungai Long campus. Besides, the correlation between the perception, knowledge, and attitude aspects was studied and discussed.

1.3 Aim of Study

To assess the perception, knowledge, and attitude on the impact of daytime nap on the risk of brain stroke among non-healthcare undergraduate students in UTAR Sungai Long campus.

1.4 Research objectives

1. To assess the perception on the impact of the daytime nap on the risk of brain stroke among non-healthcare undergraduate students in UTAR Sungai Long campus.
2. To determine the level of knowledge on the impact of the daytime nap on the risk of brain stroke among non-healthcare undergraduate students in UTAR Sungai Long campus.
3. To assess the attitude towards the impact of the daytime nap on the risk of brain stroke among non-healthcare undergraduate students in UTAR Sungai Long campus.
4. To determine the relationship between perception and knowledge on the impact of the daytime nap on the risk of brain stroke among non-healthcare undergraduate students in UTAR Sungai Long campus.
5. To determine the relationship between perception and attitude on the impact of the daytime nap on the risk of brain stroke among non-healthcare undergraduate students in UTAR Sungai Long campus.
6. To determine the relationship between knowledge and attitude on the impact of the daytime nap on the risk of brain stroke among non-healthcare undergraduate students in UTAR Sungai Long campus.

1.5 Hypotheses

H₀: 1) There is no significant relationship between the perception and attitude towards the impact of the daytime nap on the risk of brain stroke among non-healthcare undergraduate students in UTAR Sungai Long campus.

H₁: 2) There is significant relationship between the perception and attitude towards the impact of the daytime nap on the risk of brain stroke among non-healthcare undergraduate students in UTAR Sungai Long campus.

H₀: 1) There is no significant relationship between the knowledge and attitude towards the impact of the daytime nap on the risk of brain stroke among non-healthcare undergraduate students in UTAR Sungai Long campus.

H₁: 2) There is significant relationship between the knowledge and attitude towards the impact of the daytime nap on the risk of brain stroke among non-healthcare undergraduate students in UTAR Sungai Long campus.

H₀: 1) There is no significant relationship between BMI and the practice of daytime nap among non-healthcare undergraduate students in UTAR Sungai Long campus.

H₁: 2) There is significant relationship between BMI and the practice of daytime nap among non-healthcare undergraduate students in UTAR Sungai Long campus.

1.6 Operational definition

- a) Perception refers to the point of view of the subject towards the impact of daytime nap on the risk of brain stroke.
- b) Knowledge refers to the understanding of the subject on the facts of the impact of daytime nap on the risk of brain stroke.
- c) Attitude refers to the behaviour of the subject towards the impact of daytime nap on the risk of brain stroke.
- d) Daytime nap refers to a short duration of sleep during the day (Fry, 2022).
- e) Brain stroke refers to brain cells damage or necrosis due to insufficient blood supply that provide oxygen and nutrients to the brain (Holland, 2021).
- f) Risk of brain stroke refers to the possibility of developing stroke.
- g) Non-healthcare undergraduate students in UTAR refers to all students studying in Universiti Tunku Abdul Rahman (UTAR), Sungai Long campus, except for the ones taking healthcare courses such as Bachelor of Medicine and Bachelor of Surgery (MBBS), Bachelor of Physiotherapy, Bachelor of Nursing and Bachelor of Traditional Chinese Medicine.

1.7 Structure of research project

In this research paper, Chapter 1 has covered on the background of the study which include the research questions, research objectives, importance, and relevance of the study. Chapter 2 follows subsequently with the literature review done on relevant themes of past studies. Chapter 3 featured the methodology used in this research which discusses the research design, sampling design, research instrument and procedure for data collection. Chapter 4 has reported on the findings of the data collected after descriptive and inferential analysis. Lastly, Chapter 5 contains the conclude the research with the discussion of the findings, the limitation of the study and recommendations for future research.

CHAPTER 2

LITERATURE REVIEW

2.1 Chapter overview

This chapter outlines the different themes explored through past journal and literature which provides the framework for the research project.

2.2 Stages of Sleep in Nap

According to the study done by McDevitt et. al (2018), individuals who takes a greater number of naps in a week will spend more time in stage 1 and stage 2 of NREM. The study has stated that people who do not take nap spends the most of their nap time in deep NREM stage but experience less daytime sleepiness when compared to people who takes 1 to 2 naps per week spends most of their nap time in stage 2 of NREM and people who takes 3 to 4 naps per week spends most of their nap time in stage 1 of NREM and was seen to experience more daytime sleepiness. The possible reason people choose to not take daytime nap may be because they do not feel the need to take a daytime nap as they do not experience daytime sleepiness and waking up from a daytime nap may result in grogginess or drowsiness as a result in higher deep NREM stage during their nap time, also known as sleep inertia. The study explained that, physiologically, the total time of deep NREM stage and waking from deep NREM stage will determine the severity of sleep inertia experienced by the person.

Besides, evidence from the study done by Hilditch et. al (2017) have shown that healthy individuals with sufficient night-time sleep will unlikely experience deep NREM stage when they take a daytime nap for less than 15 minutes whereas 23% of deep NREM stage was observed using a polysomnography in individuals who takes daytime nap for more than 15 minutes. The researchers also stated that deep NREM stage starts around 30 minutes after sleep onset. Therefore, it is recommended to take a daytime nap for less than 30 minutes to avoid the onset of deep NREM stage. However, in cases such as poor sleep quality at night, sleep insufficiency or extended wakefulness, usually among night shift workers, the onset of deep NREM stage during a nap may be preponed to 10 to 15 minutes after sleep onset. All in all, the duration of daytime nap and the duration of deep NREM stage in a nap has a positive correlation.

Lastly, in a cohort study done by Li et. al (2016), findings show that subjects who takes more than 60 minutes of daytime nap go through a complete sleep cycle that include NREM and REM stages and waking up from stage 3 of deep NREM sleep or REM sleep may predispose to messing up the circadian rhythms leading to abnormal circadian rhythms causing disturbed night-time sleep, excessive daytime sleepiness and diminished attentiveness and cognitive fitness. Fodor et. al (2021) stated that abnormal circadian rhythm can mean more than just night-time sleep disturbance. Abnormal circadian rhythm may also lead to increase in the risk of brain stroke and the post-stroke neurorehabilitation as it causes molecular, cellular, and physiological alterations in the body affecting the health and recovery capacity of the nervous tissue.

2.3 Hypersomnolence

Based on Nevsimalova et. al (2022), hypersomnolence is a neurological central disorder characterized by excessive daytime sleepiness (EDS) and abnormally long night-time sleep period causing one to experience difficulty to focus causing reduced in performance and efficiency, diminished long-term and short-term memory, overall reduce in quality of life and may even lead to higher risk of morbidity and mortality.

Interestingly, the experience of EDS in hypersomnolence individual is not due to disturbed night-time sleep, sleep apnea, lack of sleep, nor disturbed circadian rhythms. Instead, it can be due to a medical condition in narcolepsy type 1 individuals, a mental health condition in narcolepsy type 2 individuals, drug or substance such as sedatives, hypnotic medications and antipsychotics in idiopathic hypersomnia (IH) individuals and insufficient sleep syndrome in individuals with Kleine-Levin syndrome (KLS) (Preda, 2018).

According to Skiba and Shaikh (2020), the diagnosis of hypersomnolence can be done using the multiple sleep latency test (MSLT) where patient is required to take a nap for five times that has been scheduled by the physician prior to the test. The patient will be awakened after 15 minutes of nap, but, in case patient did not fall asleep, the nap trial will end after 20 minutes. The next nap trial will start 2 hours after the previous trial.

As mentioned previously, hypersomnolence includes the narcolepsy, the most common disease in hypersomnolence, and non-narcolepsy hypersomnia namely IH and KLS. Narcolepsy is a chronic neurological disorder that can be divided into narcolepsy type 1 (NT1) and narcolepsy type 2 (NT2). Both NT1 and NT2 is diagnosed when an individual experience more than 3 months of EDS and has sleep latency of 8 minutes or less and more than 2 sleep-onset REM periods when running the MSLT. However, NT1 and NT2 is differentiated with the presence of cataplexy and the level of cerebrospinal fluid hypocretin-1. NT1 patients will experience cataplexy and decrease in cerebrospinal fluid hypocretin-1 whereas patients with NT2 will not experience any cataplexy and has normal cerebrospinal fluid hypocretin-1 level (Nevsimalova et. al, 2022).

Next, IH is diagnosed when patient undergoing the MSLT has sleep latency of below 8 minutes and less than 2 sleep-onset REM period. Besides, Individuals with IH often has long sleeping period of more than 11 hours within a 24-hours period and may have trouble in staying awake (Gudka et. al, 2022).

Lastly, the rarest disorder in hypersomnolence is KLS or also known as recurrent hypersomnia characterized by episodes excessive sleep period of up to 20 hours in a 24-hours period and behavioural changes such as excessive eating, childishness, disorientation, and hallucinations. Individuals with KLS may not be aware of the changes during the episodes and they appear to be completely normal between the episodes. The episodes of KLS may last up to a few weeks. These changes during an episode may be due to failure of hypothalamus and thalamus in the brain which are responsible to regulate appetite and sleep (Iftikhar, 2022).

2.4 The Effect of Daytime Nap on the Physiological Changes in the Body

Based on Yan et al. (2020) and Jin et al. (2021), both studies have concluded that the practice of daytime nap potentially increases the risk of brain stroke. However, both studies used different measures to describe the impact of daytime nap on the risk of brain stroke. Yan et al. (2020) stated that when the duration of daytime nap is longer than 30 minutes and frequency of more than or equals to 5 times per week, individuals have a higher potential of developing a brain stroke whereas Jin et al. (2021) stated that risk of brain stroke increases by 3% for every 10 minutes of daytime nap. However, the mechanism of how daytime nap increases the risk of brain stroke remain unclear while previous studies have observed several physiological changes in the body after waking up from daytime nap that potentially increase the risk of brain stroke which are the drastic increase in blood pressure, heart rate and catecholamines such as dopamine, norepinephrine, and epinephrine in the blood plasma.

In addition, when there is a surge in catecholamines in the blood plasma, expression of plasminogen activator inhibitor (PAI) gene increases in the cardiovascular system by beta-adrenoceptors leading to increase in production of PAI mRNA. PAI gene is responsible in the production of serine-protease inhibitor which inhibits tissue type and urinary type plasminogen activator leading to hypercoagulability of blood due to hypo fibrinolysis. Besides, PAI genes react on adipokines and causes hardening of arteries, known as atherosclerosis (Nambiar & Chalappurath, 2019). Based on the study done by Al-Sharea et al. (2019), high blood pressure that constantly exerts on the blood vessels causes strain and weakening them. In both physiological changes in the body, atherosclerotic plaque may start to form and accelerate, mainly due to high

blood pressure, on the hardened arteries and rupture of plaque may occur leading to formation of blood clot due to hypercoagulability. When blood clot travels to the brain, it blocks and restrict the blood flow leading to brain stroke.

Furthermore, in the study done by Li et. al (2016), findings show that daytime nap of more than 30 minutes which is considered long period of time may lead to a spike in Haemoglobin A1c (HbA1c) and Homeostatic Model Assessment for Insulin Resistance (HOMA-IR) index in both male and female. On the other hand, people who do not practice daytime nap or practice daytime nap for less than 30 minutes were not found to be experiencing an increase in HbA1c level and HOMA-IR index. Besides, the study conducted among Chinese middle-aged population by Baoying et. al (2014) has also concluded that healthy individuals who have usual practice of daytime nap was observed to have elevated HbA1c levels and insulin resistance whereas individuals who have less than 6 hours or more than 8 hours of night-time sleep was observed to have lower risk of developing insulin resistance. According to Dansinger (2020), HbA1c test is a diagnostic tool to obtain information on the average level of glucose present in the blood over the past 2 to 3 months. In the study done by Sherwani et. al (2016), a spike in HbA1c reading may be followed by coronary heart disease and brain stroke. On the other hand, the HOMA-IR levels indicate insulin resistance in an individual by multiplying fasting plasma insulin and fasting plasma glucose followed by dividing a constant of 22.5. An elevated HOMA-IR value above 2.9 indicates significant insulin resistance (Qu et. al, 2011).

Importantly, insulin is a peptide hormone that regulates the blood glucose level in the body by transmitting signals to the cells to uptake glucose from the blood for energy. In the case of excessive glucose in the blood, the liver will

convert the glucose into glycogen by glycogenesis upon receiving signals from insulin and stored until the body demand for glucose (Petersen, 2018). Being insulin resistance means the cells are unable to respond to the insulin causing them to have difficulty in using glucose from the blood. As the result, the pancreas will produce and secrete more insulin to encourage the uptake of glucose from the blood but over time, the pancreas will not be able to keep up and causing one to have prediabetes and eventually type II diabetes if no changes to lifestyle and diet is made or no treatment given (Dansinger, 2021).

Besides, Li et. al (2016) stated that individuals with obstructive sleep apnea, sleep deprivation, atherosclerosis and diabetes have higher risk of developing insulin resistance and findings have shown the capability of insulin is in influencing the REM and NREM phases of sleep through the interaction of neurotransmitters such as serotonin, catecholamines and acetylcholine in the brain. Therefore, the study has concluded that long daytime nap and long nighttime sleep practices can upsurge the risk of coronary heart disease by increasing the blood viscosity and fibrinolysis which are found to be significantly related to insulin resistance.

Additionally, Mantua and Spencer (2015) stated that evidence of the study has shown increased inflammation among young adults with higher rate of napping. Inflammation in the body can be measured by the level of C-Reactive Protein (CRP) in the body through blood test. CRP level will usually rise in response to cell injury and the nature of rapid production makes it a sensitive and reliable inflammation marker. In the events of insufficient sleep or poor sleep quality at night especially among obstructive sleep apnea and type 2 diabetes individuals, white blood cells and inflammatory cytokines will be

activated triggering a rise in CRP level to facilitate inflammation. Additionally, Leng et. al (2014) also reported that individuals with the practice of daytime nap was found to have 10% higher CRP levels compared with non-nappers.

In summary, the practice of daytime nap may give benefits to the body given it is practiced in a proper way. Daytime napping for more than 30 minutes may result in negative impact on health such as higher risk of diabetes, higher risk of cardiovascular disease, higher risk of brain stroke, higher risk of mental health issues such as depression and many more. For a better picture on how much riskier it is to take a long daytime nap, the study done by Wang et. al (2020) stated that daytime nap for more than an hour per day have resulted in 31% higher risk of diabetes. The research also stated that prolonged daytime nap has resulted in higher risk of high blood pressure, depression and brain stroke regardless of gender.

2.5 Effects of Daytime Nap on Night-time Sleep

Based on Pacheco (2022), a person will often feel recharged after waking up from a nap or sleep but slowly feeling more tired with time and this phenomenon is called homeostatic sleep pressure or sleep drive. The homeostatic sleep pressure increases the longer the person is awake, and it will be at its lowest after waking up from a good quality adequate sleep. The complete sleep cycle of a healthy adult comprises of 2 stages of light NREM followed by deep NREM and lastly the REM stage. The article has suggested that daytime nap should be taken in the morning when the homeostatic sleep pressure is still low as the nap will mainly comprises of light REM stage and lower chances of entering the REM stage. On the other hand, daytime nap taken in the late evening will include more deep sleep due to the increase in homeostatic sleep pressure and this may lead to disruption of night-time sleep.

Furthermore, Mograss et. al (2022) studied on the impact of daytime nap on night-time sleep and found that individuals who take daytime nap for more than 3 times per week and napping less than 7 hours prior to night-time sleep experience more fragmentation of sleep at night leading to poor night-time sleep quality when compared to non-nappers. Fragmentation of sleep can be calculated using the polysomnography to study the sleep architecture by obtaining the sum of total number of awakenings and the total sleep time. Higher index may indicate poor sleep quality at night with possibilities of difficulties in falling asleep and/or frequent awakenings between sleep.

CHAPTER 3

METHODS

3.1 Chapter overview

This chapter will discuss on the methodology used in this research, highlighting the research design, sampling design, research instrument and procedure in detail.

3.2 Research design

The research design for this study was cross-sectional as it was a noninterventive, self-administered, online survey as face to face and physical interactions is not advised during the Covid-19 pandemic. The recruitment of targeted participants was via social media platforms such as WhatsApp Messenger, Facebook Messenger, Instagram, and Microsoft Teams by sending the questionnaire link prepared through Google Forms. The targeted participants were full-time non-health science undergraduate students in UTAR Sungai Long campus that were still active in their academics at time of recruitment and the sampling method was convenience sampling. The initial contacts of the investigators were approached first and are encouraged to share and pass on the questionnaire link to their relevant friends to participate in this study.

3.3 Ethical approval

This study was performed after obtaining the ethical approval from the Scientific and Ethical Review Committees (SERC) of UTAR (Appendix A).

3.4 Sampling Design

The targeted participants were full-time non-healthcare undergraduate students in UTAR Sungai Long campus that were still active in their academics at time of recruitment. The inclusion criteria for this study is UTAR Sungai Long campus student, full-time student, non-healthcare undergraduate student, male and female students and the exclusion criteria for this study include individuals diagnosed with sleep disorders and/or under investigation of any sleep disorders. The sample size was calculated based on the population size of 6479 UTAR non-healthcare undergraduate students where 3427 students from Lee Kong Chian Faculty of Engineering and Science (LKC FES), 1188 students from Faculty of Creative Industries (FCI) and 1864 students from Faculty of Accountancy and Management (FAM) quoted by the Division of Admissions and Credit Evaluation of UTAR. Using the Raosoft® Sample Size Calculator (Appendix D) with 95% confidence level, 5% confidence interval and 50% response distribution, the sample size required for this study is 363 with an additional of 36 people to account for the 10% dropout rate resulting in the final sample size to be 399. The sampling method used was convenience sampling as the process of data collection was done among university non-healthcare undergraduate students in UTAR Sungai Long campus who were conveniently available to participate in this study (Edgar & Manz, 2017).

3.5 Research instrument

The questionnaire distributed was mainly divided into 6 sections. Section 1 (Appendix B) is the informed consent section that contain a brief introduction to the background of the study as well as the aim of the study. The researcher's contact information was also included in the section 1 of the questionnaire for any further enquiries or clarification regarding the questionnaire.

Next, section 2 is the Personal Data Protection notice, and consent form (Appendix B) aim to confirm participant's will to participate in the study and giving consent to the researcher to collect and process their personal information such as name, age, height, weight, e-mail address, level of study and faculty of study that will be collected in the following section.

Section 3 is the demographic data section (Appendix E) that aims to collect the basic information of the participants to ensure they have met the inclusion and exclusion criteria of the study. Basic information such as name, age, weight, height, e-mail, campus location, level of study, mode of study, major of study and faculty were collected. The aim of collecting participants' weight and height is to calculate the BMI of the participants and later to correlate it with the habit of taking daytime nap. The aim of collecting participants' e-mail is to be able to contact them for any additional information needed during data cleaning and data analysis. The other questions including campus location, level of study, mode of study, major of study and faculty act as the screening questions to ensure participants are eligible to participate in the study. Campus location was either Kampar campus or Sungai Long campus as there are only these 2 UTAR campuses. Level of study includes choices of foundation; undergraduate and postgraduate where only undergraduate students are eligible for this study.

Mode of study is either full-time or part-time as only full-time students will be included in the study. Major of study is either health science or non-health science where only non-health science students are eligible to participate in the study. Lastly, the selections for the faculty question were Faculty of Creative Industries (FCI), Faculty of Accountancy and Management (FAM), and Lee Kong Chian Faculty of Engineering and Science (LKC FES) as there are only these 3 faculties that offer non-health science related courses in UTAR Sungai Long campus.

Section 4 of the questionnaire titled “Perception Towards the Impact of Daytime Nap on the Risk of Brain Stroke” aims to evaluate the perception of the participants towards the impact of daytime nap on the risk of brain stroke to determine whether participants have positive perception or negative perception on the topic. This section uses a 4-point Likert scale that requires participants to state if they strongly agree, agree, disagree, or strongly disagree on the given statement. Participants was able to place a score of 1-4 on each statement, and the total score of the scale was calculated and categorized the participants into poor perception (6-11), average attitude (12-17), and good attitude (18-24) as shown in Table 3.1.

Section 5 of the questionnaire titled “Knowledge on the Impact of Daytime Nap on the Risk of Brain Stroke” aims to evaluate the knowledge of the participants on the impact of daytime nap on the risk of brain stroke to determine whether participants are knowledgeable or not knowledgeable on the topic. This section requires participants to select yes or no for the given questions designed to assess the level of knowledge of the participants. This section was scored with maximum scoring of 5 and minimum scoring of 10, and the score

was calculated and categorized the participants into poor knowledge (5-6), average knowledge (7-8), and good knowledge (9-10) as shown in Table 3.1.

Section 6 of the questionnaire titled “Attitude Towards the Impact of Daytime Nap on the Risk of Brain Stroke” aims to evaluate attitude of the participants towards the impact of daytime nap on the risk of brain stroke to assess whether the participants are having positive attitude or negative attitude towards the topic. This section uses a 4-point Likert scale that requires participants to state if they strongly agree, agree, disagree, or strongly disagree on the given statement. Participants was able to place a score of 1-4 on each statement, and the total score of the scale was calculated and categorized the participants into poor attitude (4-7), average attitude (8-11), and good attitude (12-16) as shown in Table 3.1.

Table 3.1: Scoring table for perception, knowledge, and attitude on the impact of daytime nap on the risk of brain stroke

Scale	Scores	Group
Perception	6-11	Poor Perception
	12-17	Average Perception
	18-24	Good Perception
Knowledge	5-6	Poor Knowledge
	7-8	Average Knowledge
	9-10	Good Knowledge
Attitude	4-7	Poor Attitude
	8-11	Average Attitude
	12-16	Good Attitude

3.6 Procedure

Questions aiming to collect data regarding the perception, knowledge, and attitude of the participants on the impact of daytime nap on the risk of brain stroke was drafted based on several literature support where 7 questions were allocated for each aspect. Then, the questionnaire was sent to 10 experts in the field namely Professor Dr Ravi Yadav, professor at National Institute of Mental Health and Neurosciences (NIMHANS) and also a Diplomate of World Sleep Society, from India, Dr. Himanshu Sharma, a neuro physiotherapist with Doctor of Physical Therapy qualification, from India, Dr. Manvir Bhatia, a senior neurologist and sleep specialist with 20 years of experience, from India, and Ms. Liew Siew Fun, UTAR Lecturer and Head of Department of Nursing, Ms. Kokila, UTAR lecturer from Department of Allied Health Sciences, Mr. Muhammad Noh Zulfikri, UTAR lecturer and Head of Department of Physiotherapy, Ms. Siti Hazirah, Mr. Sathish Kumar, Ms. Nurul Husna and Mr. Martin Ebenezer who are UTAR lecturer from Department of Physiotherapy via email and physical approach for validation of the self-prepared questionnaire. Upon receiving validation of the questionnaire together with valuable suggestions and comments given by 5 respected validators, the questionnaire was being discussed and necessary restructure and amendments were done to produce a more refined version of the questionnaire. In the end, 2 questions were added in the demographic data section to obtain the respective weight and height of the participants to calculate the BMI later as suggested by one the validators. Then, the Fleiss Kappa value was being calculated using Microsoft Excel and a value of 0.58 was obtained which indicates moderate agreement among the 5 respected validators (Hartling et. al, 2012). Next, a pilot study was done by randomly

distributing the questionnaire to 26 targeted participants which is 7% of the sample size for this research to calculate the reliability score by calculating the Cronbach's alpha value (Tavakol & Dennick, 2011). Using the IBM Statistical Package for Social Science (SPSS) software version 20, the Cronbach's alpha value is 0.834 which indicates a good internal consistency of the questionnaire.

Moving on, upon receiving the ethical approval for carrying out this research by the UTAR Scientific and Ethical Review Committee, the researcher proceeds to send out the questionnaire online using Google Forms via various platforms such as WhatsApp Messenger, Facebook Messenger, Instagram, and Microsoft Teams to potential participants. Besides, participants were highly encouraged to share the questionnaire among their course mates and friends who are non-health care undergraduate students in UTAR to participate in this study. Furthermore, students who are studying in UTAR Sungai Long campus were also invited physically by the researcher to participate in the study by scanning the QR code that leads to the questionnaire Google Form.

In the frontmost page of the questionnaire, an invitation message with the aim of the study and contact details of the researcher were to allow participants to understand the aim of the study and to allow participants to contact the researcher for any further explanation. All the respondents of the questionnaire were required to give their informed consent and digital signature before proceeding to participate in the research. Each respondent was required to answer all the questions and encouraged to contact the researcher if there are any enquiries. After the data collection process is done, the researcher proceeds to clean and code the data.

Lastly, a digital pamphlet (Appendix I) may be distributed to all the valuable participants via email to provide knowledge regarding the topic and hopefully to further improve their attitude and practice of daytime nap. On the other hand, a talk may be organized in the near future inviting the public and the participants of this study to further deliver the information of daytime nap and to answer any enquiries regarding the topic.

3.7 Data analysis

Data analysis was done with SPSS software version 20. Descriptive analysis was done on each statement allocated in each section, namely the perception, knowledge, and attitude to get the frequency and percentage of each choice of answers and the scoring of each section to get the mean score, standard deviation, and variance. In addition, inferential analysis was also done using Spearman's correlation test to determine the correlation between the perception aspect and the knowledge aspect, the perception aspect, and the attitude aspect, and lastly the knowledge aspect and the attitude aspect. Moreover, Pearson Chi-Square test was run to test the correlation between the BMI and practice of daytime nap. A P-value less than 0.05 was considered statistically significant.

CHAPTER 4

RESULTS

4.1 Chapter overview

The following chapter features the findings after the data collection process for the research project. Firstly, the demographic data of the respondents are presented followed by the perception aspect, the knowledge aspect, and the attitude aspect on the impact of daytime nap on the risk of brain stroke.

A total of 400 responses were collected but 35 responses were excluded as they did not meet the inclusion criteria of this study. The 35 responses include 8 participants who disagree to give consent to process their personal data, 7 foundation students, 10 healthcare students, 4 part-time students, 5 postgraduate students and 1 student from UTAR Kampar campus. These data were removed from the data analysis process, therefore, only 365 responses were processed in the final stage of the study.

4.2 Demographic of population

This subsection highlights the demographic data of the participants in form of graphs, descriptions and lastly a table summarizing the overall subsection.

Table 4.1: Demographic data

Demographic data	N (%)	Mean (SD)
Age		
18-20	197 (54.0)	
21-23	165 (45.2)	
24-26	3 (0.8)	
Weight (kg)		59.12 (13.47)
Height (m)		1.66 (0.08)
Body Mass Index		21.15 (4.22)
Underweight (<18.5 kg/m ²)	90 (24.7)	
Normal (18.5 - <25.0 kg/m ²)	218 (59.7)	
Overweight (25.0 - <30.0 kg/m ²)	39 (10.7)	
Obese (>30.0 kg/m ²)	18 (4.9)	
Faculty		
FCI	86 (23.6)	
FAM	141 (38.6)	
LKC FES	138 (37.8)	

4.2.1 Age

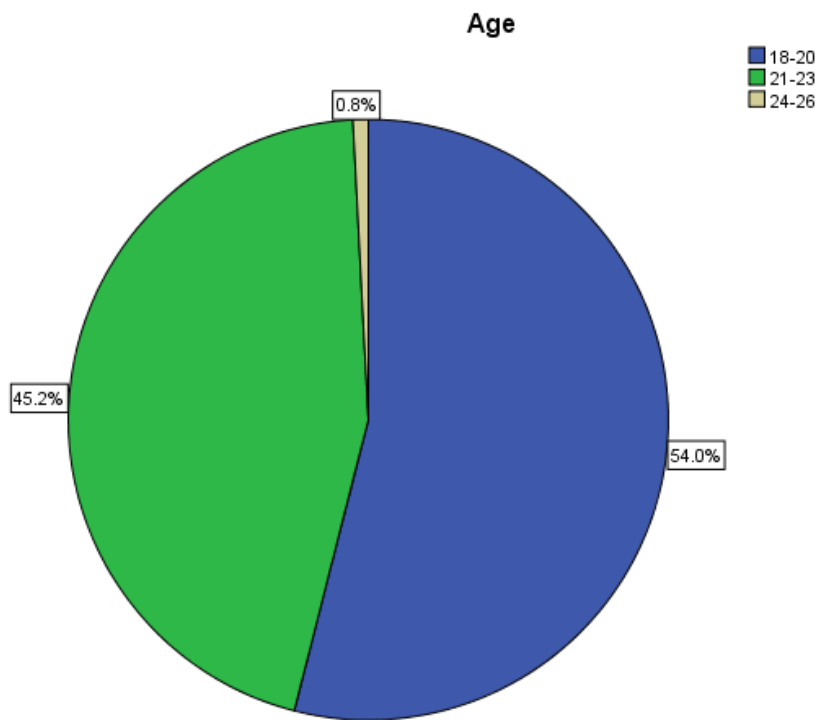


Figure 4.1: Age of participants

Figure 4.1 displays the age distribution of this study. Based on Table 4.1, 197 respondents that represent 54.0% of the total respondents were from age group 18 to 20 years old, 165 respondents that represent 45.2% of the total respondents were from age group 21 to 23 years old and 3 respondents that represent 0.8% of the total respondents were from age group 24 to 26 years old.

4.2.2 Weight

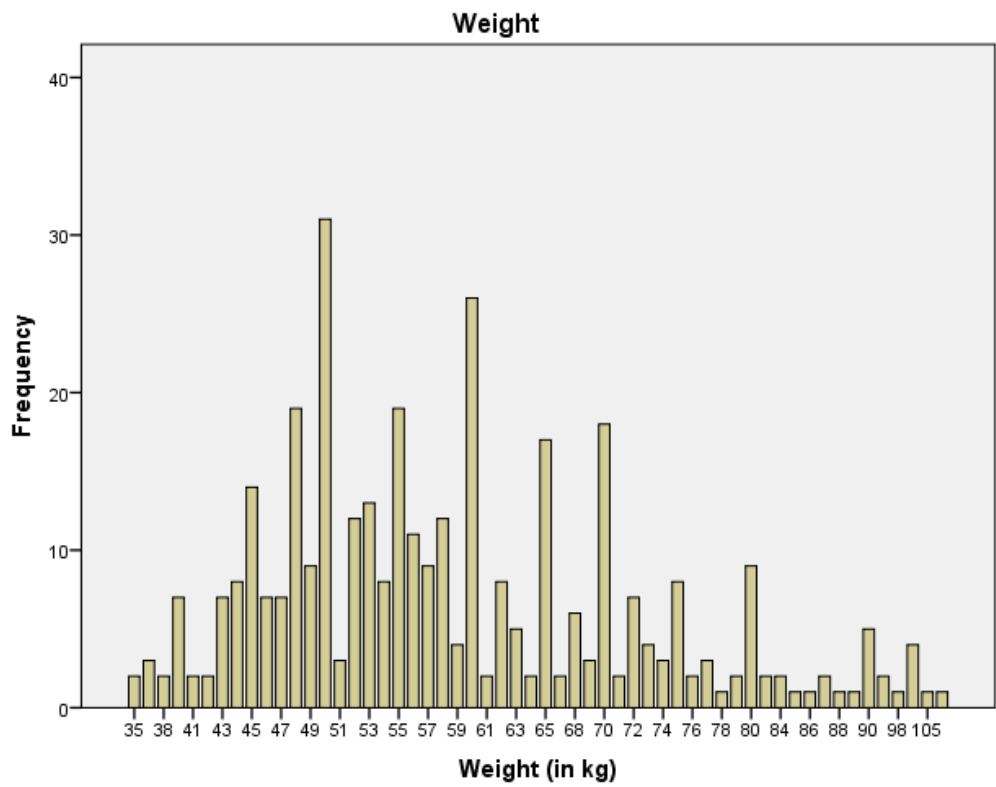


Figure 4.2: Weight of participants

Figure 4.2 displays the weight distribution of this study. Based on Table 4.1, the mean weight of the participants is 59.12 kg with standard deviation of 13.47.

4.2.3 Height

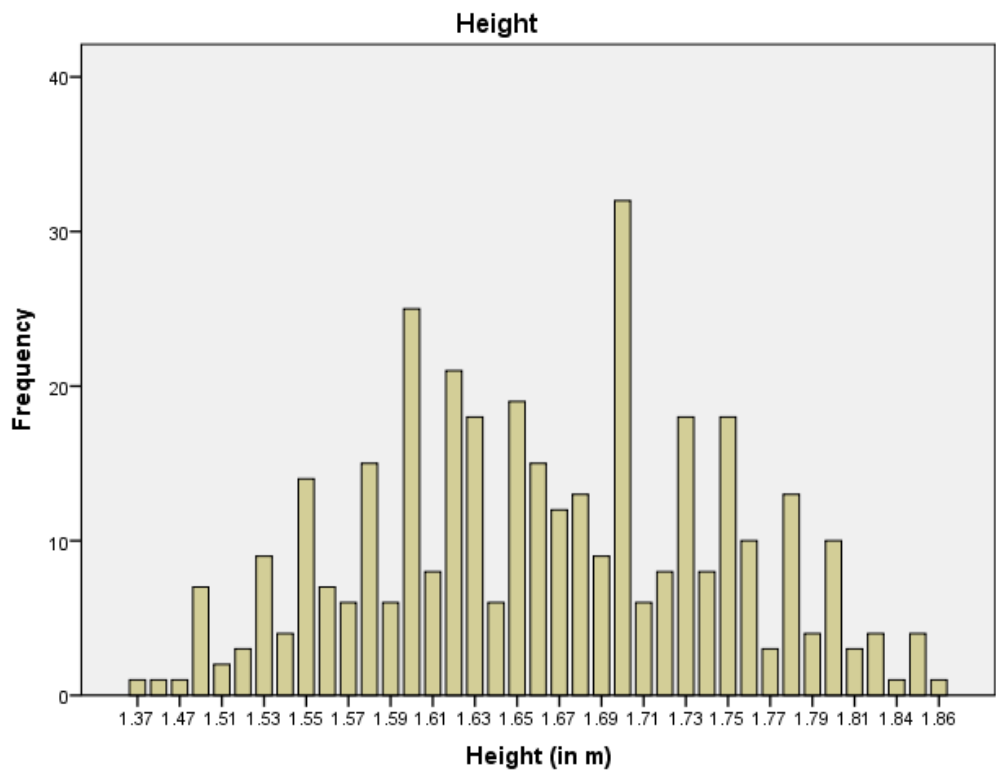


Figure 4.3: Height of participants

Figure 4.3 displays the height distribution of this study. Based on Table 4.1, the mean height of the participants is 1.66 m with standard deviation of 0.08.

4.2.4 Body Mass Index (BMI)

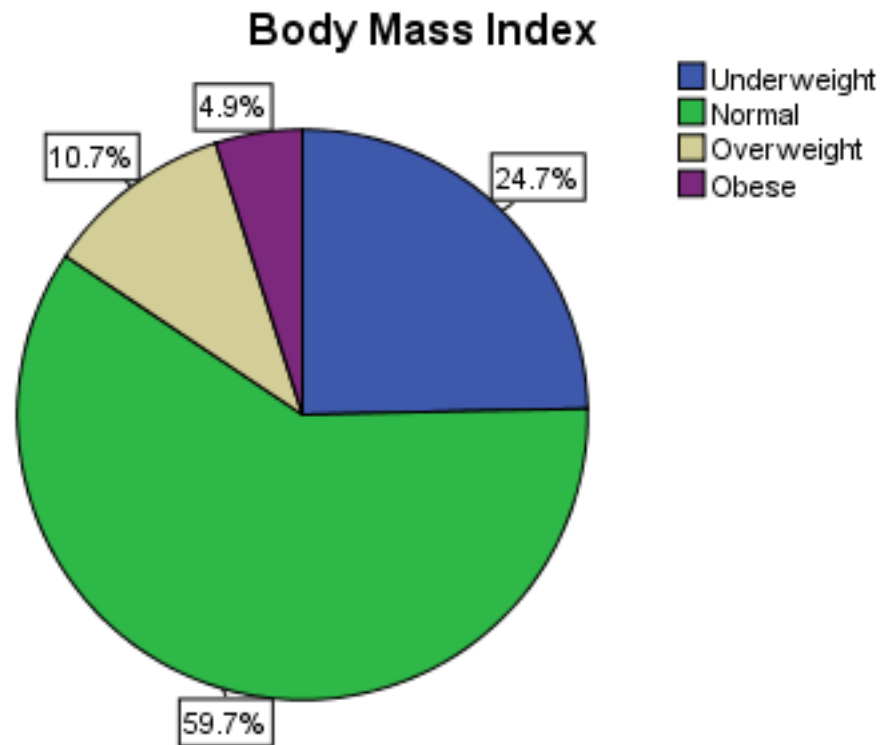


Figure 4.4: Body mass index of participants

The BMI of participants were calculated by dividing their weight in kilograms and the square of their height in metres. Figure 4.4 displays the BMI distribution of this study. Based on Table 4.1, there are 90 respondents who are underweight ($<18.5 \text{ kg/m}^2$) which makes up 24.7% of the total respondents, 218 respondents who has normal healthy BMI (18.5 kg/m^2 to $<25.0 \text{ kg/m}^2$) which makes up 59.7% of the total respondents, 39 respondents who are overweight (25.0 kg/m^2 to $<30.0 \text{ kg/m}^2$) which makes up 10.7% of the total respondents and 18 respondents who are obese ($>30.0 \text{ kg/m}^2$) which makes up 4.9% of the total respondents. The mean BMI of all 365 respondents was 21.15 with standard deviation of 4.22.

4.2.5 Faculty of Study

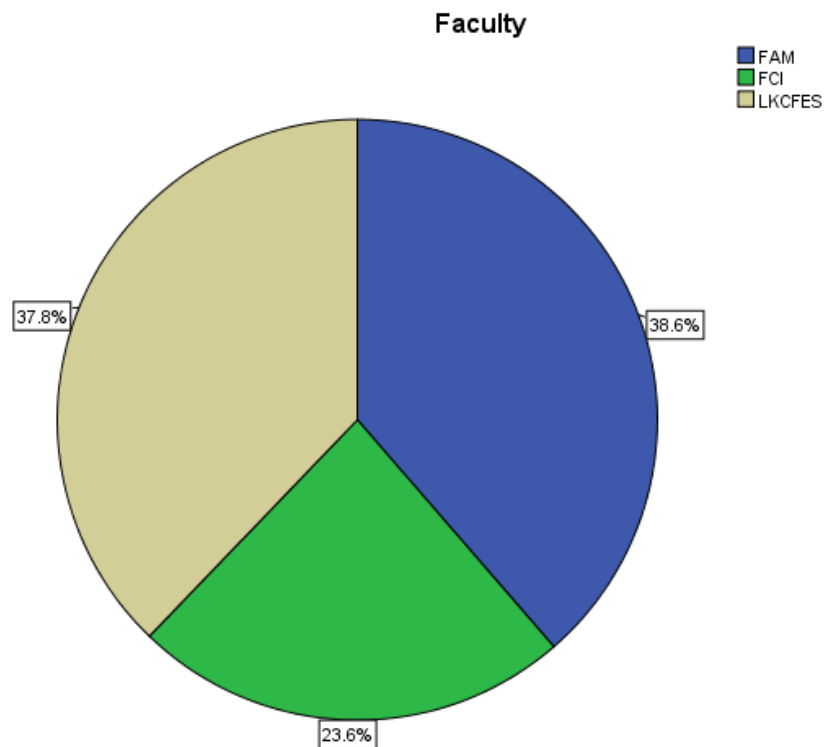


Figure 4.5: Participant's faculty of study

There are 3 faculties of study in UTAR Sungai Long campus which are Faculty of Accountancy and Management (FAM), Faculty of Creative Industries (FCI) and Lee Kong Chian Faculty of Engineering and Sciences (LKC FES). Figure 4.5 displays the distribution of participant's faculty of study in this study. Based on Table 4.1, 141 respondents were students from FAM which makes up 38.6% of the total respondents, 86 respondents were students from FCI which makes up 23.6% of the total respondents and 138 respondents were students from LKC FES which makes up 37.8% of the total respondents.

4.3 Perception Towards the Impact of Daytime Nap on the Risk of Brain

Stroke

Table 4.2: Perception towards the impact of daytime nap on the risk of brain

Perception	N (%)
Long daytime nap(s) are good for health	
Strongly Disagree	21 (5.8)
Disagree	167 (45.8)
Agree	135 (37.0)
Strongly Agree	42 (11.5)
A person takes daytime nap(s) because of poor sleep quality at night	
Strongly Disagree	6 (1.6)
Disagree	86 (23.6)
Agree	207 (56.7)
Strongly Agree	66 (18.1)
Daytime nap(s) can affect the hormonal level in the body	
Strongly Disagree	1 (0.3)
Disagree	87 (23.8)
Agree	242 (66.3)
Strongly Agree	35 (9.6)
Taking daytime nap(s) can affect blood pressure	
Strongly Disagree	3 (0.8)
Disagree	101 (27.7)
Agree	235 (64.4)
Strongly Agree	26 (7.1)
Long daytime nap(s) can cause brain strokes	
Strongly Disagree	17 (4.7)
Disagree	197 (54.0)
Agree	130 (35.6)
Strongly Agree	21 (5.8)
It is hard to fall asleep at night after taking daytime nap(s)	
Strongly Disagree	18 (4.9)
Disagree	81 (22.2)
Agree	166 (45.5)
Strongly Agree	100 (27.4)

4.3.1 Perception on Long Nap(s) are Good for Health

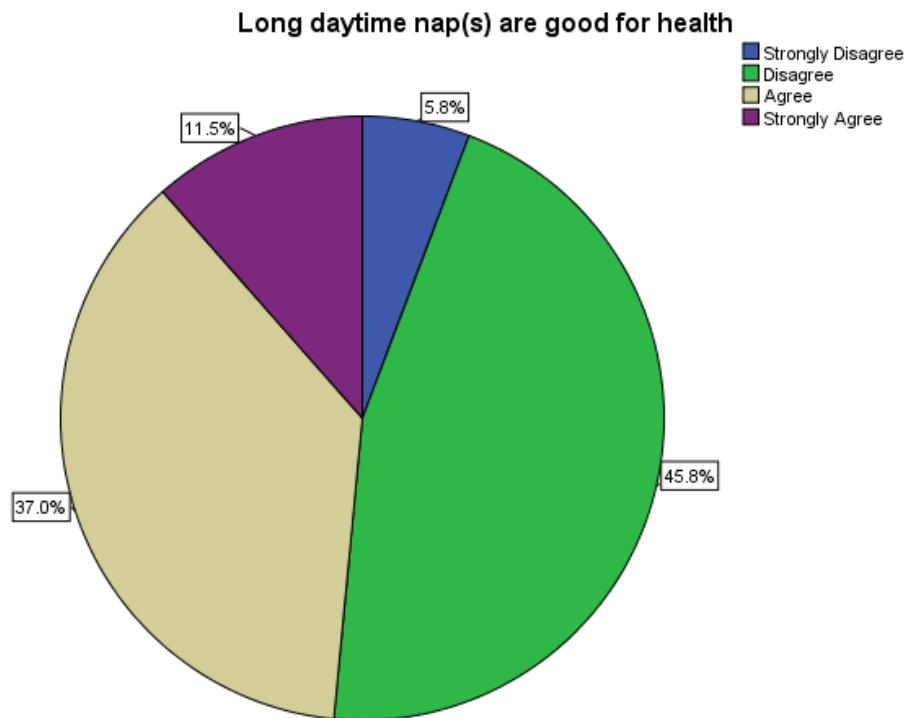


Figure 4.6: Perception on long nap(s) are good for health

Based on Table 4.2 and Figure 4.6, out of the 365 responses collected, 5.8% of the responses represented by 21 respondents strongly disagreed, 45.8% of the responses represented by 167 respondents disagreed, 37.0% of the responses represented by 135 respondents agreed and 11.5% of the responses represented by 42 respondents strongly agreed when each of the respondents were asked regarding their opinion on whether long daytime nap(s) are good for health.

4.3.2 Perception on Daytime Nap(s) Can Affect Hormonal Level in the Body

Daytime Nap May Be Due to Poor Sleep Quality at Night

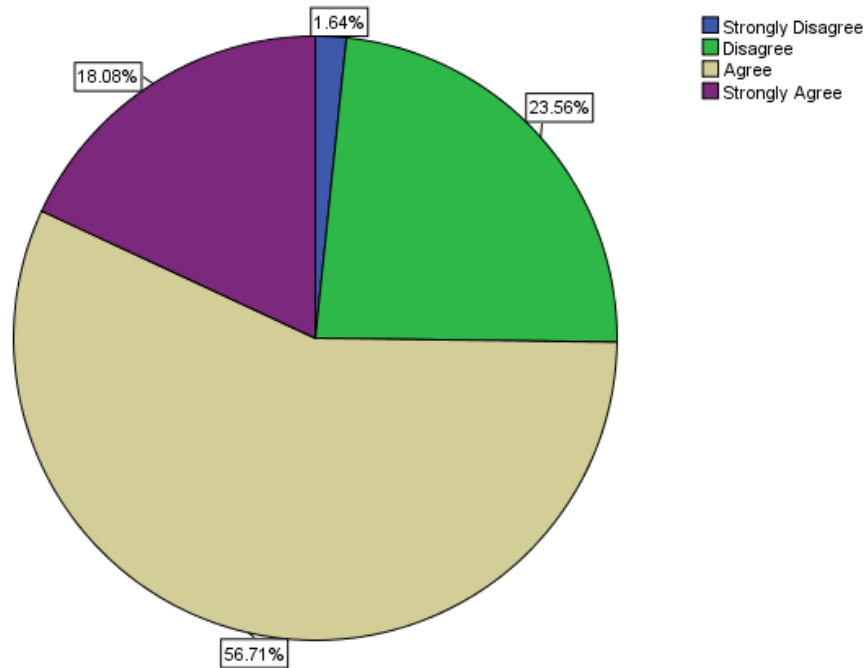


Figure 4.7: Perception on daytime nap(s) may be due to poor sleep quality at night

Based on Table 4.2 and Figure 4.7, 1.6% of the responses represented by 6 respondents strongly disagreed, 23.6% of the responses represented by 86 respondents disagreed, 56.7% of the responses represented by 207 respondents agreed and 18.1% of the responses represented by 66 respondents strongly agreed when each of the respondents were asked regarding their opinion on whether taking daytime nap(s) are due to poor sleep quality at night.

4.3.3 Daytime Nap(s) Can Affect Hormonal Level in the Body

Daytime Nap(s) Can Affect Hormonal Level in the Body

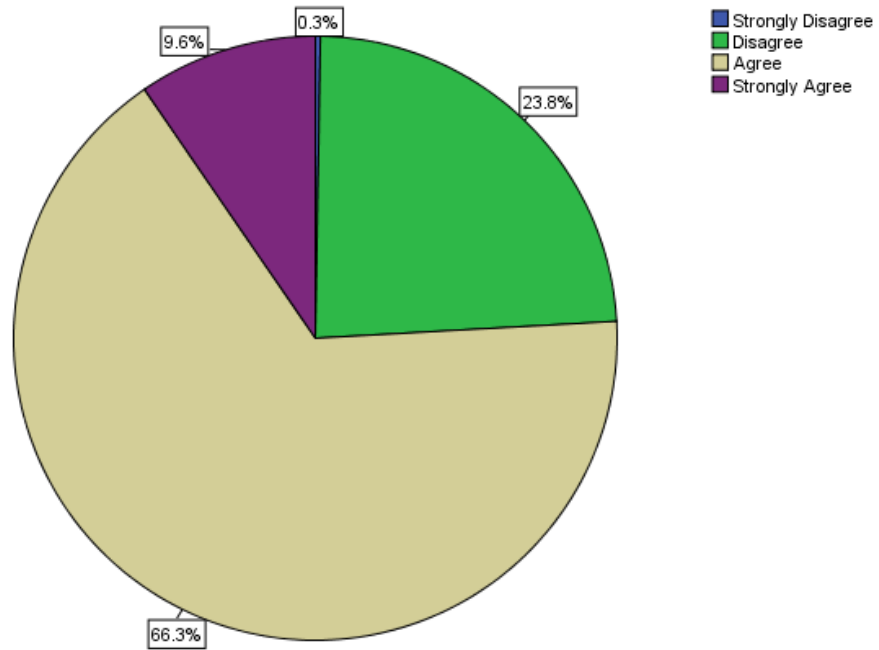


Figure 4.8: Perception on daytime nap(s) can affect hormonal level in the body

Based on Table 4.2 and Figure 4.8, respondents were asked regarding their opinion on whether taking daytime nap(s) will affect the hormonal level in the body and 0.3% of the responses represented by 1 respondent strongly disagreed, 23.8% of the responses represented by 87 respondents disagreed, 66.3% of the responses represented by 242 respondents agreed and 9.6% of the responses represented by 35 respondents strongly agreed with the statement.

4.3.4 Perception on Daytime Nap(s) Can Affect Blood Pressure in the Body

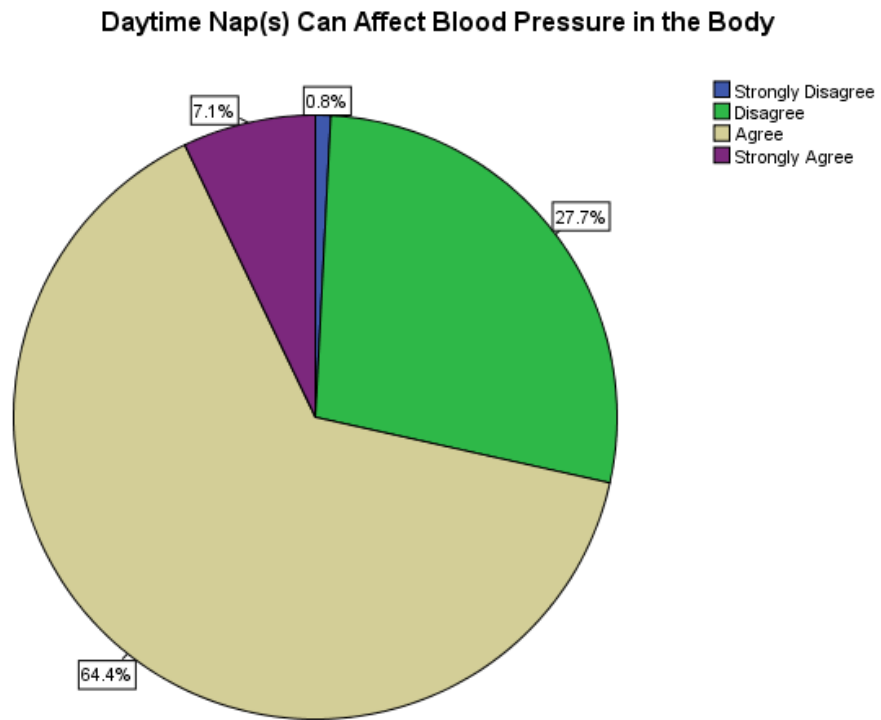


Figure 4.9: Perception on daytime nap can affect blood pressure

Based on Table 4.2 and Figure 4.9, respondents were also asked regarding their opinion on whether taking daytime nap(s) will affect the blood pressure in the body and 0.8% of the responses represented by 3 respondents strongly disagreed, 27.7% of the responses represented by 101 respondents disagreed, 64.4% of the responses represented by 235 respondents agreed and 7.1% of the responses represented by 26 respondents strongly agreed with the statement.

4.3.5 Perception on Long Daytime Nap(s) Can Cause Stroke

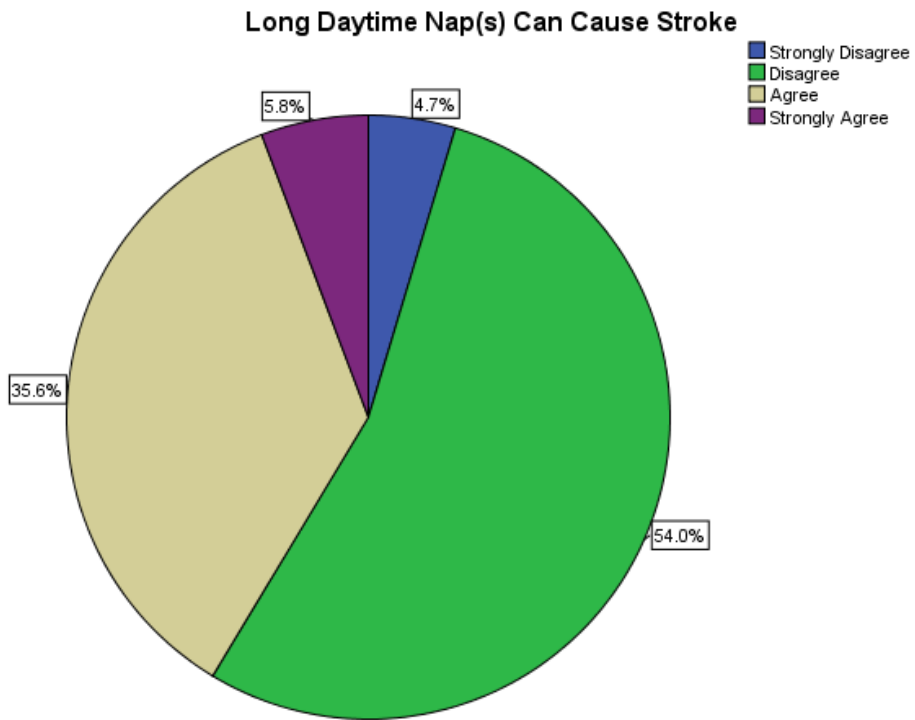


Figure 4.10: Perception on long daytime nap can cause stroke

Based on Table 4.2 and Figure 4.10, respondents were asked regarding their opinion on whether long daytime nap(s) can lead to brain stroke and 4.7% of the responses represented by 17 respondents strongly disagreed, 54.0% of the responses represented by 197 respondents disagreed, 35.6% of the responses represented by 130 respondents agreed and 5.8% of the responses represented by 21 respondents strongly agreed with the statement.

4.3.6 Perception on Daytime Nap(s) Can Affect Night-Time Sleep

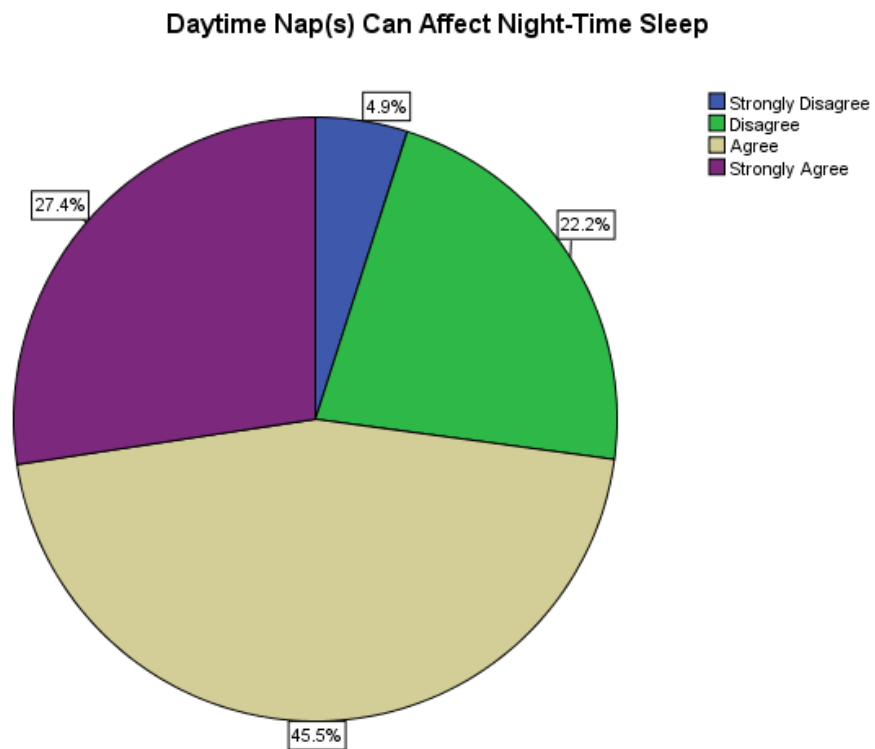


Figure 4.11: Perception on Daytime Nap(s) Can Affect Night-Time Sleep

Based on Table 4.2 and Figure 4.11, respondents were also asked regarding their opinion on whether taking daytime nap(s) will lead to difficulty in falling asleep at night and 4.9% of the responses represented by 18 respondents strongly disagreed, 22.2% of the responses represented by 81 respondents disagreed, 45.5% of the responses represented by 166 respondents agreed and 27.4% of the responses represented by 100 respondents strongly agreed with the statement.

4.3.7 Perception Score of Participants

Table 4.3: Perception score of participants

Perception Score	N (%)	Mean (SD)
Perception Score		16.38 (2.11)
Poor (6-11)	4 (1.1)	
Average (12-17)	254 (69.6)	
Good (18-24)	107 (29.3)	

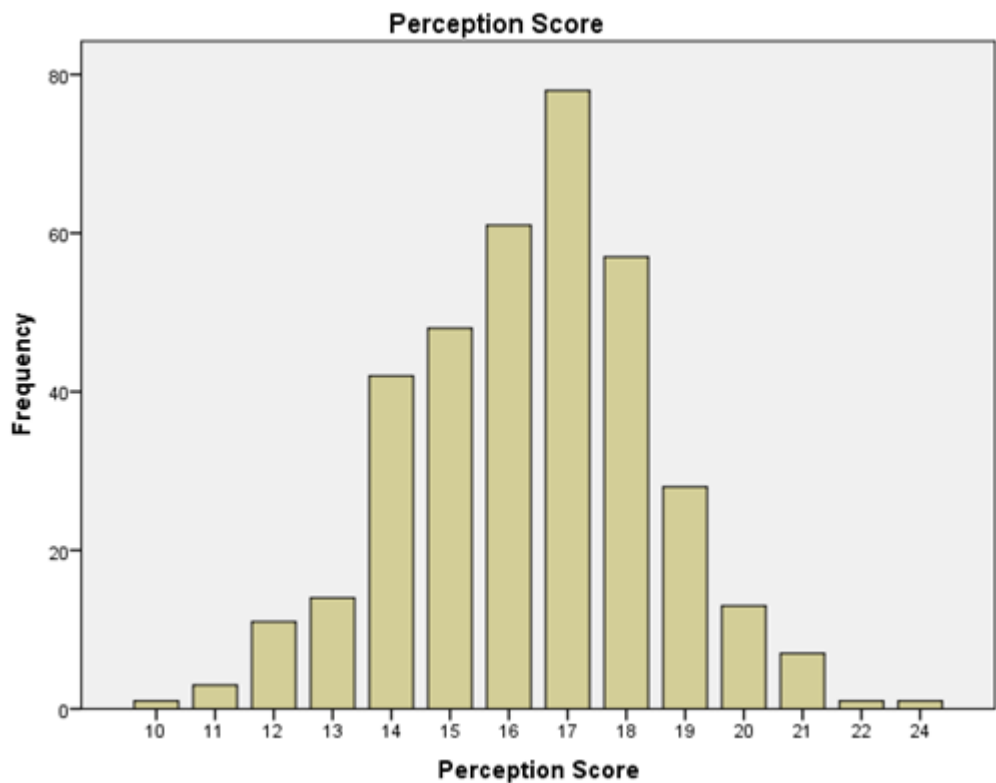


Figure 4.12: Perception score of participants

Figure 4.12 displays the distribution of participant's perception score of this study. Based on Table 4.3, the mean perception score of the participants in this study is 16.38 out of 24 points with standard deviation of 2.11.

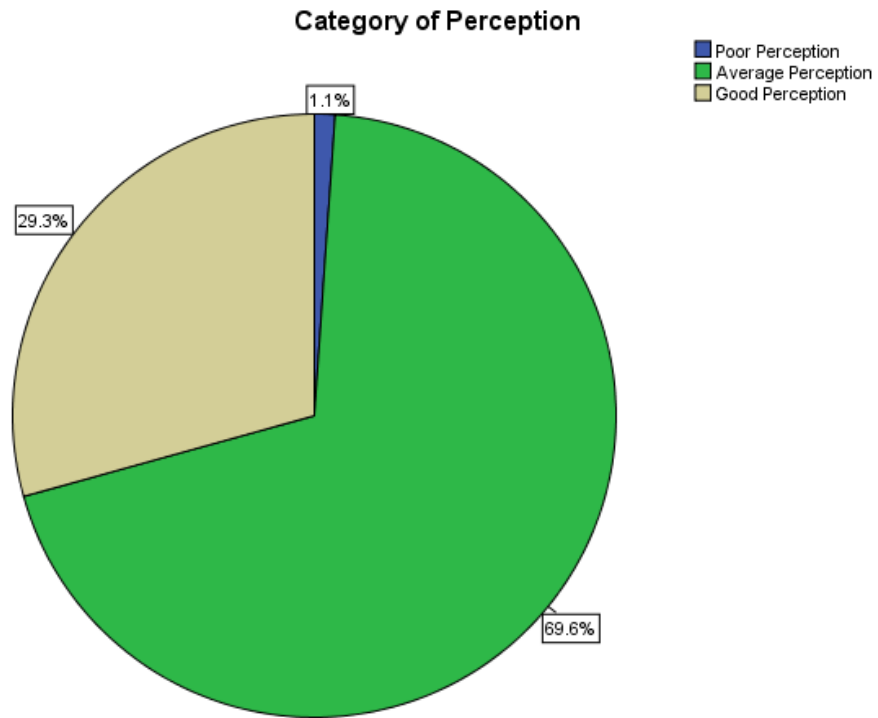


Figure 4.13: Participant’s category of perception

Figure 4.13 displays the distribution of participant’s category of perception towards the impact of daytime nap on the risk of brain. Based on Table 4.3, 1.1% of the total responses represented by 4 respondents has poor perception score between 6 to 11 score, 69.6% of the total responses represented by 254 respondents has average perception score between 12 to 17 score and 29.3% of the total responses represented by 107 respondents has good perception score between 18-24 score. In conclusion, majority of the respondents has average perception score.

4.4 Knowledge on the Impact of Daytime Nap on the Risk of Brain Stroke

Table 4.4: Knowledge on the impact of daytime nap on the risk of brain stroke

Knowledge	N (%)
Do you take daytime nap(s) in a day?	
Yes	248 (67.9)
No	117 (32.1)
How long do you take daytime naps in a day?	
Less than 30 minutes	55 (22.2)
More than 30 minutes	193 (77.8)
When do you usually take daytime nap(s)?	
Before 2pm	28 (11.3)
After 2pm	220 (88.7)
Do you know daytime nap(s) can be because of poor sleep quality at night?	
Yes	274 (75.1)
No	91 (24.9)
Do you know that daytime naps can increase the risk of brain stroke?	
Yes	90 (24.7)
No	275 (75.3)

4.4.1 Practice of Daytime Nap of Participants

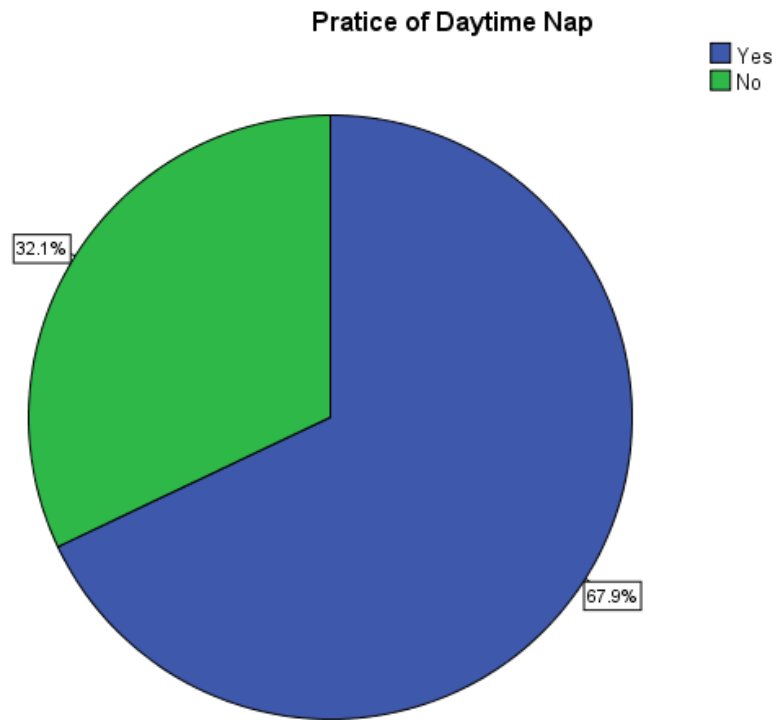


Figure 4.14: Practice of daytime nap of participants

Based on Table 4.3 and Figure 4.14, 67.9% of the total responses represented by 248 respondents reported that they have the habit of taking daytime nap(s) and the rest of 32.1% of the total responses represented by 117 respondents reported that they do not have the habit of taking daytime nap(s).

4.4.2 Duration of Daytime Nap of Participants

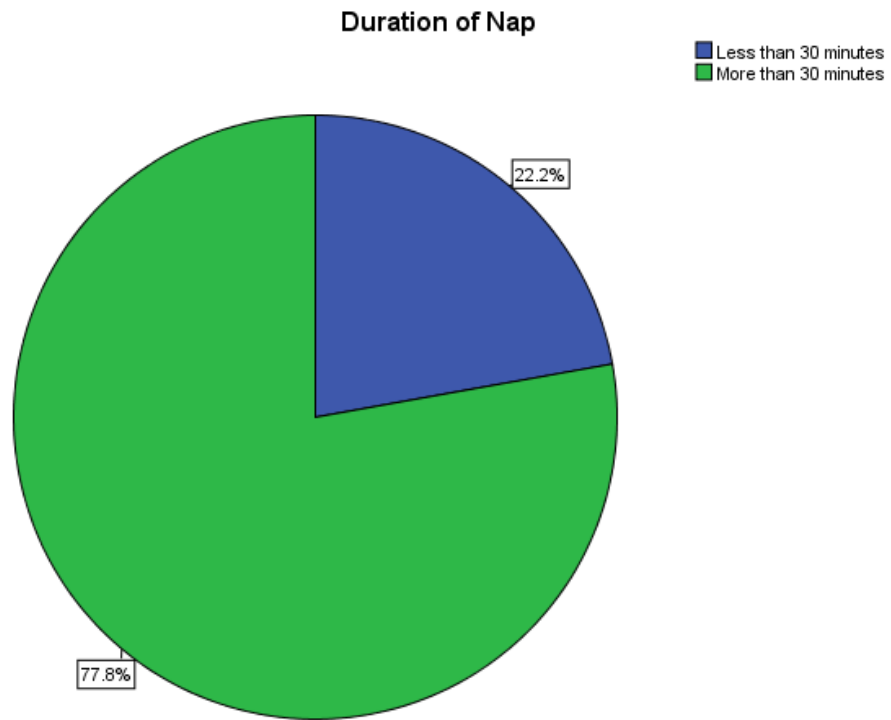


Figure 4.15: Duration of daytime nap of participants

Based on Table 4.3 and Figure 4.15, 22.2% of the 248 respondents who have the habit of taking daytime nap(s), represented by 55 respondents reported that they usually take daytime nap(s) for less than 30 minutes and the rest of 77.8% represented by 193 respondents reported that they usually take daytime nap(s) for more than 30 minutes.

4.4.3 Time of Daytime Nap(s) of Participants

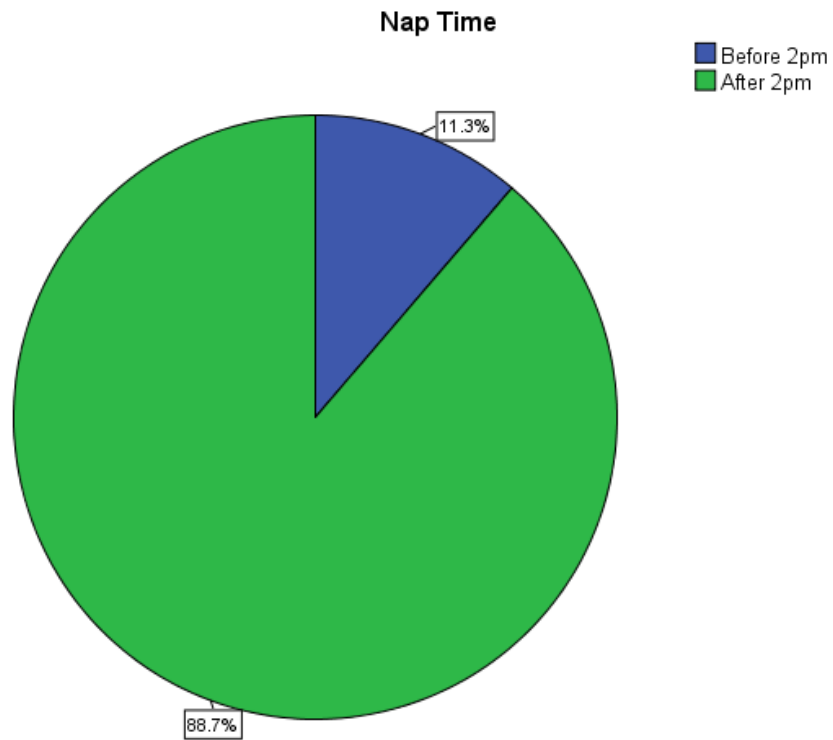


Figure 4.16: Nap time of participants

Based on Table 4.3 and Figure 4.16, 11.3% of the 248 respondents who have the habit of taking daytime nap(s), represented by 28 respondents reported that they usually take daytime nap(s) before 2 p.m. and the rest of 88.7% represented by 117 respondents reported that they usually take daytime nap(s) after 2 p.m.

4.4.4 Knowledge on Daytime Nap May Be Due to Poor Sleep Quality at Night

Daytime Nap May Be Due To Poor Sleep Quality at Night

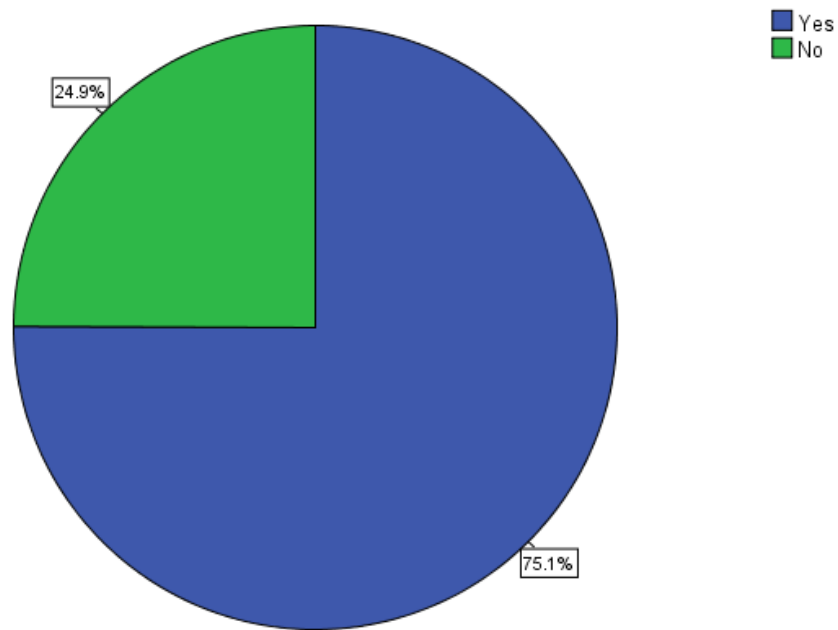


Figure 4.17: Knowledge on daytime nap may be due to poor sleep quality at night of participants

Based on Table 4.3 and Figure 4.17, respondents were asked regarding their knowledge on whether daytime nap(s) may be due to poor sleep quality at night and 75.1% of the total responses represented by 274 respondents answered yes and the rest of 24.9% of the total responses represented by 91 respondents answered no.

4.4.5 Knowledge on Daytime Nap Can Increase Risk of Brain Stroke

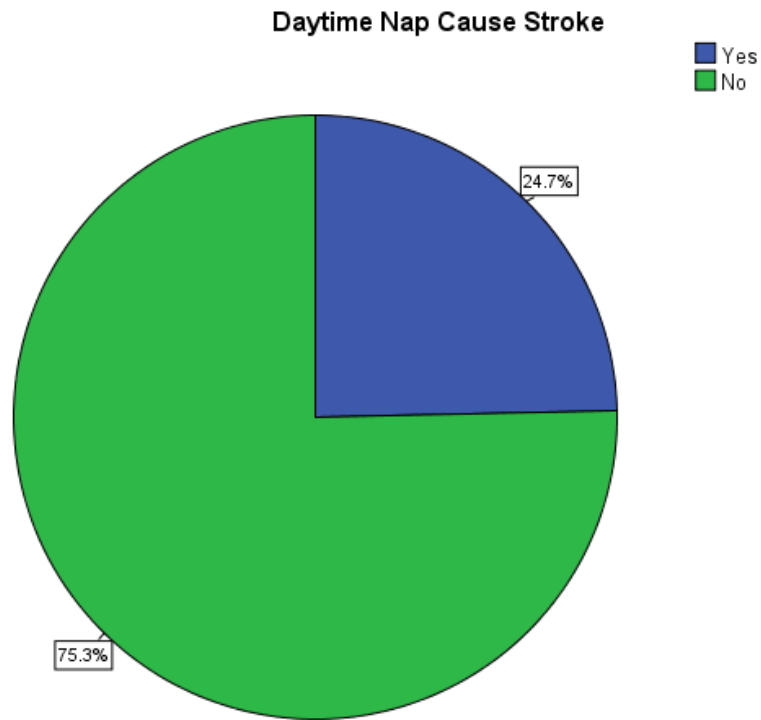


Figure 4.18: Knowledge on daytime nap can increase risk of brain stroke of participants

Based on Table 4.3 and Figure 4.18, respondents were asked regarding their knowledge on whether daytime nap(s) can increase the risk of brain stroke and 24.7% of the total responses represented by 90 respondents answered yes and the rest of 75.3% of the total responses represented by 275 respondents answered no.

4.4.6 Knowledge Score of the Participants

Table 4.5: Knowledge score of participants

Knowledge Score	N (%)	Mean (SD)
Knowledge Score		6.90 (1.08)
Poor (5-6)	129 (35.3)	
Average (7-8)	215 (58.9)	
Good (9-10)	21 (5.8)	



Figure 4.19: Knowledge score of participants

Figure 4.19 displays the distribution of participant's knowledge score of this study. Based on Table 4.5, the mean knowledge score of the participants in this study is 6.90 out of 10 points with standard deviation of 1.08.

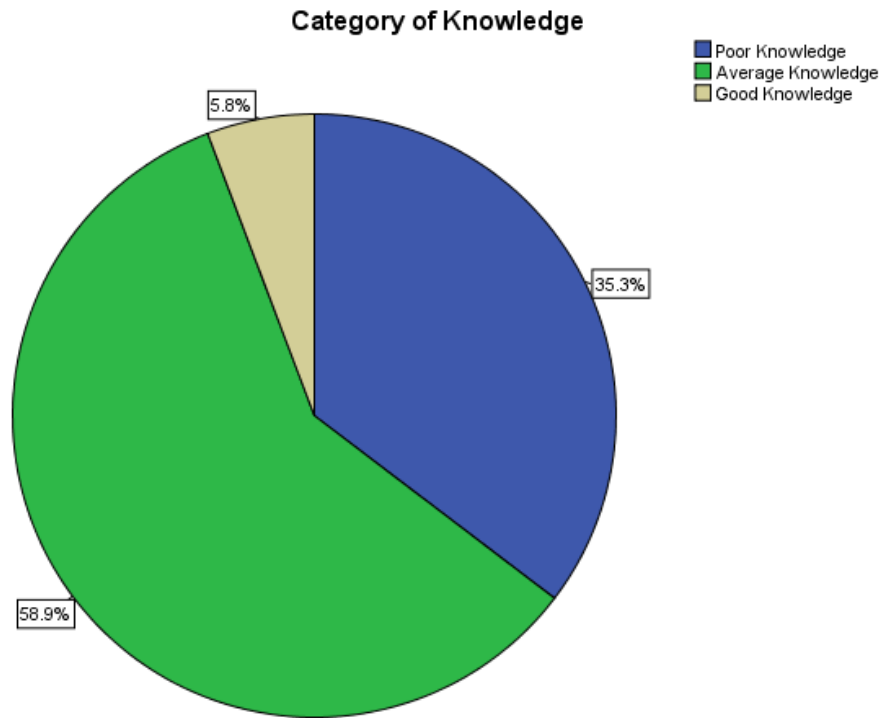


Figure 4.20: Participant’s category of knowledge

Figure 4.20 displays the distribution of participant’s category of knowledge towards the impact of daytime nap on the risk of brain stroke. Based on Table 4.5, 35.3% of the total responses represented by 129 respondents has poor knowledge score between 5 to 6, 58.9% of the total responses represented by 215 respondents has average knowledge score between 7 to 8 and 5.8% of the total responses represented by 21 respondents has good knowledge score between 9-10. In conclusion, majority of the respondents has average knowledge score.

4.5 Attitude Towards the Impact of Daytime Nap on the Risk of Brain Stroke

Table 4.6: Attitude towards the impact of daytime nap on the risk of brain stroke

Attitude	N (%)
I feel more tired after I wake up from daytime nap(s)	
Strongly Disagree	12 (3.3)
Disagree	127 (34.8)
Agree	174 (47.7)
Strongly Agree	52 (14.2)
I will stop taking daytime nap(s) if I know it may increase the risk of brain stroke	
Strongly Disagree	12 (3.3)
Disagree	100 (27.4)
Agree	189 (51.8)
Strongly Agree	64 (17.5)
I wish to know more about the dangerous effects of daytime nap(s)	
Strongly Disagree	5 (1.4)
Disagree	28 (7.7)
Agree	242 (66.3)
Strongly Agree	90 (24.7)
I wish to know more about the benefits of daytime nap(s)	
Strongly Disagree	2 (0.5)
Disagree	16 (4.4)
Agree	239 (65.5)
Strongly Agree	108 (29.6)

4.5.1 Feeling More Tired After Daytime Nap

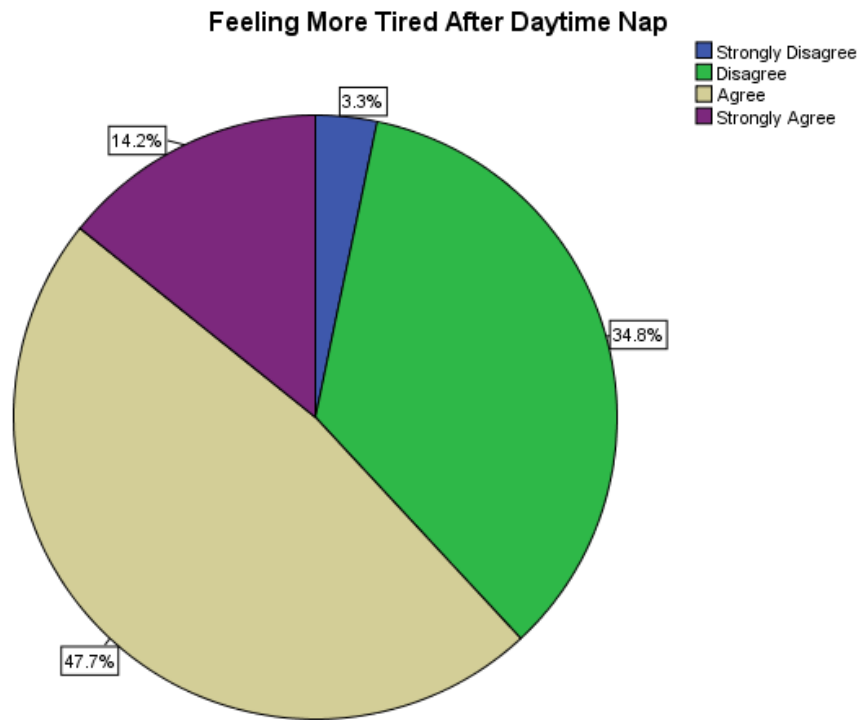


Figure 4.21: Attitude of participants feeling more tired after taking daytime nap(s)

Based on Table 4.6 and Figure 4.21, respondents were asked whether they feel more tired after waking up from daytime nap(s) and 3.3% of the responses represented by 12 respondents strongly disagreed, 34.8% of the responses represented by 127 respondents disagreed, 47.7% of the responses represented by 174 respondents agreed and 14.2% of the responses represented by 52 respondents strongly agreed that they feel more tired after waking up from daytime nap(s).

4.5.2 Willingness to Stop Taking Daytime Nap After Knowing the Risk

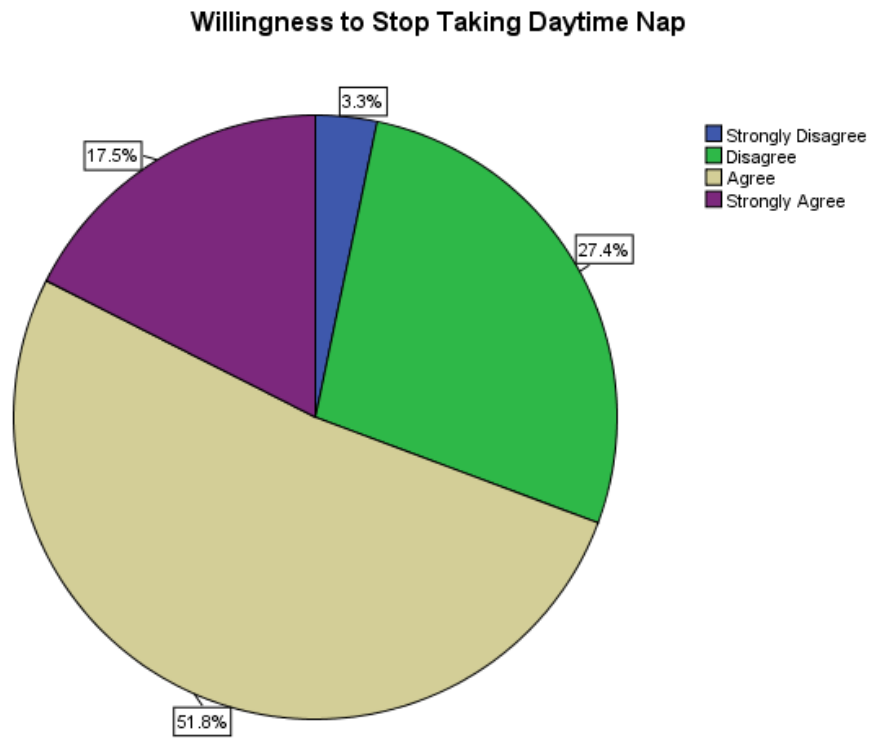


Figure 4.22: Willingness to stop taking daytime nap after knowing the risk

Based on Table 4.6 and Figure 4.22, respondents were asked regarding their willingness to stop taking daytime nap after knowing it may increase the risk of brain stroke and 3.3% of the responses represented by 12 respondents strongly disagreed, 27.4% of the responses represented by 100 respondents disagreed, 51.8% of the responses represented by 189 respondents agreed and 17.5% of the responses represented by 64 respondents strongly agreed that they will stop taking daytime nap after knowing it may increase the risk of brain stroke.

4.5.3 Desire to Know More on the Dangerous Effects of Daytime Nap

Wish to Know More on the Dangerous Effect of Daytime Nap

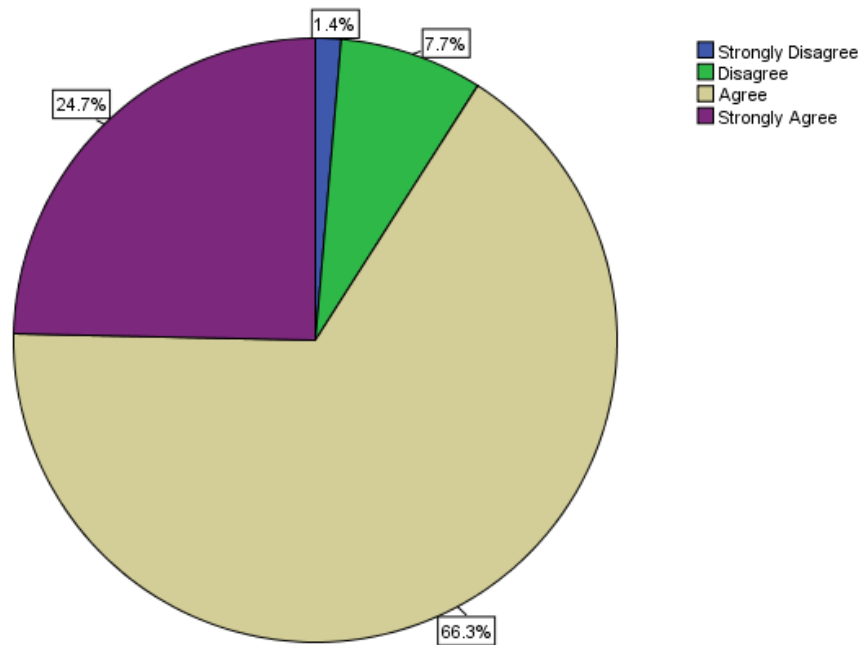


Figure 4.23: Participant's desire to know more on the dangerous effects of daytime nap

Based on Table 4.6 and Figure 4.23, respondents were asked regarding their desire to know more on the danger of daytime nap and 1.4% of the responses represented by 5 respondents strongly disagreed, 7.7% of the responses represented by 28 respondents disagreed, 66.3% of the responses represented by 242 respondents agreed and 24.7% of the responses represented by 90 respondents strongly agreed that they are willing to know more on the dangerous effects of daytime nap.

4.5.4 Desire to Know More on the Benefits of Daytime Nap

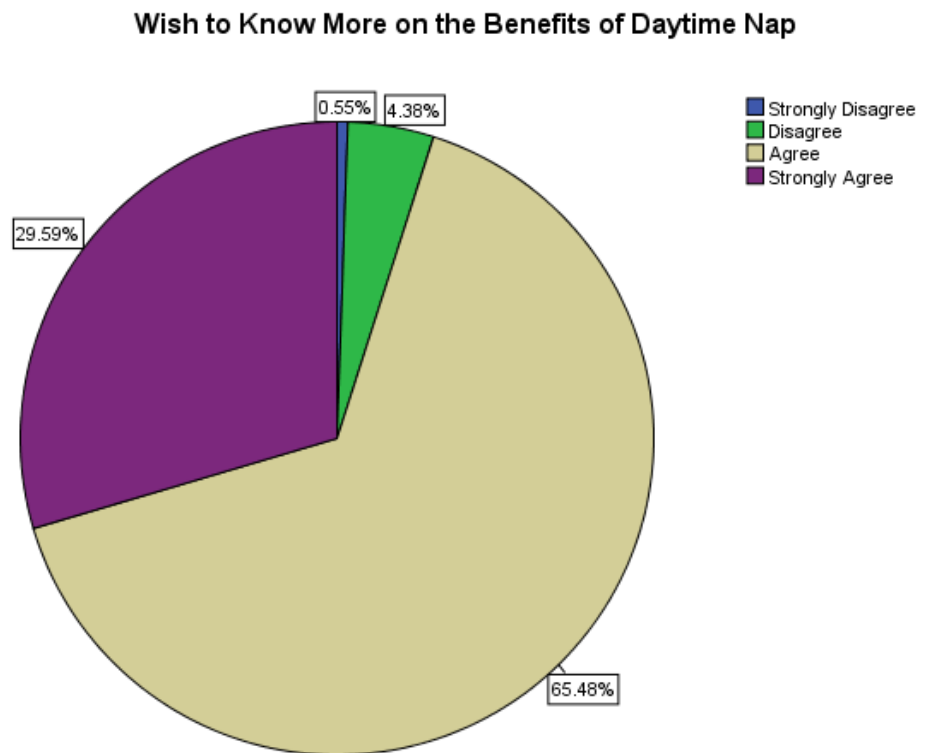


Figure 4.24: Participant's desire to know more on the benefits of daytime nap

Based on Table 4.6 and Figure 4.24, respondents were asked regarding their desire to know more on the benefits of daytime nap and 0.5% of the responses represented by 2 respondents strongly disagreed, 4.4% of the responses represented by 16 respondents disagreed, 65.5% of the responses represented by 239 respondents agreed and 29.6% of the responses represented by 108 respondents strongly agreed that they are willing to know more on the benefits of daytime nap.

4.5.5 Attitude Score of the Participants

Table 4.7: Attitude score of participants

Attitude Score	N (%)	Mean (SD)
Attitude Score		11.49 (1.36)
Poor (4-7)	2 (0.5)	
Average (8-11)	194 (53.2)	
Good (12-16)	169 (46.3)	

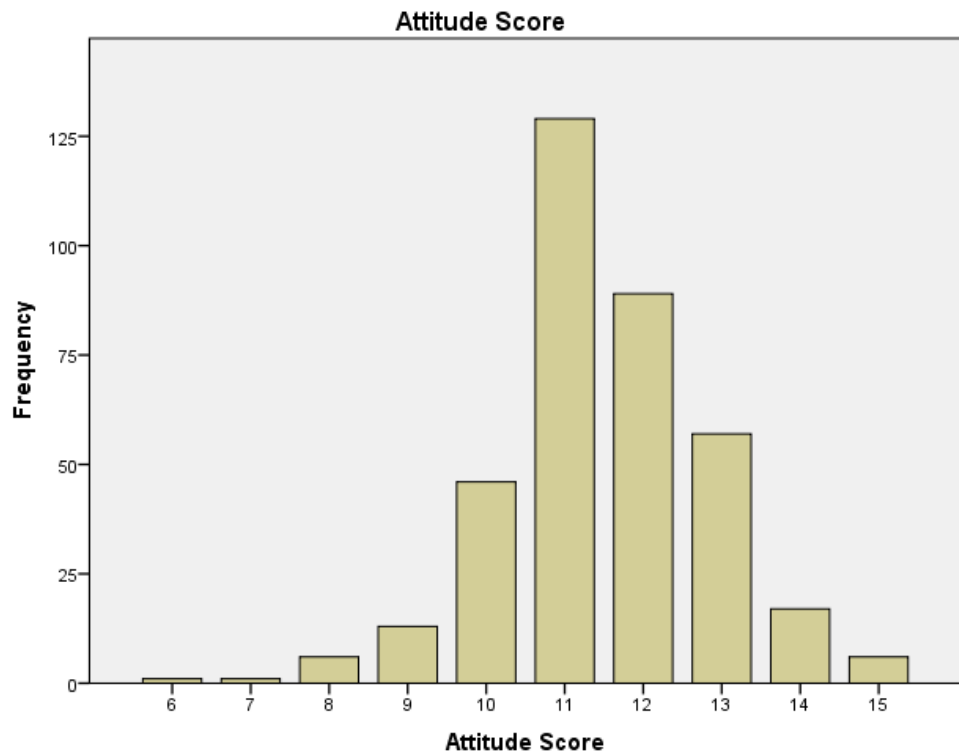


Figure 4.25: Attitude score of participants

Figure 4.25 displays the distribution of participant's attitude score of this study. Based on Table 4.7, the mean attitude score of the participants in this study is 11.49 out of 15 points with standard deviation of 1.36.

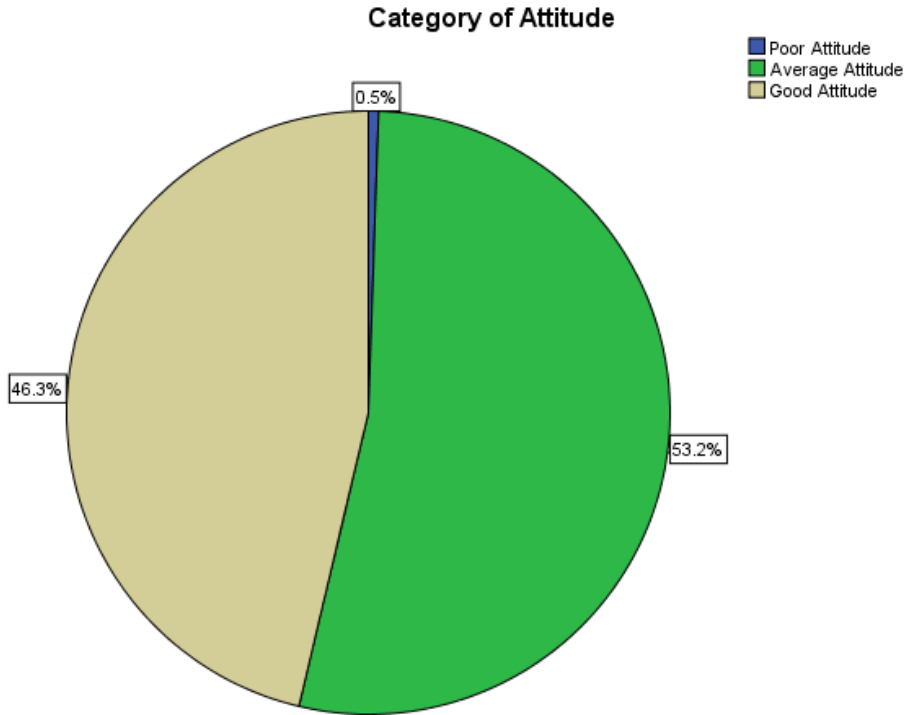


Figure 4.26: Participant's category of attitude

Figure 4.26 displays the distribution of participant's category of attitude towards the impact of daytime nap on the risk of brain stroke. Based on Table 4.7, 0.5% of the total responses represented by 2 respondents has poor attitude score between 4 to 7, 53.2% of the total responses represented by 194 respondents has average attitude score between 8 to 11 and 46.3% of the total responses represented by 169 respondents has good attitude score between 12-16. In conclusion, majority of the respondents has average attitude score.

4.6 Inferential Analysis

4.6.1 Spearman Correlation

Normality tests were done on the perception score, knowledge score and attitude score to determine whether the data obtained was normally distributed. Since the sample size is larger than 50, Kolmogorov-Smirnov test is used instead of Shapiro-Wilk test (Mishra et. al, 2019). Result showed that the significance value were less than 0.05 therefore the H_0 is rejected. As H_0 states that data are obtained from normal distributed population, therefore, the data obtained is not normally distributed.

According to Bishara and Hittner (2015), Spearman's correlation test can be used to determine the correlation between data with nonnormality. Therefore, as shown in Table 4.8, Spearman's correlation test was used to determine the correlation between perception aspect and attitude aspect and knowledge aspect and attitude aspect together with their respective correlation value and significance value.

Table 4.8: Results of Spearman's correlation test

	Attitude
<u>Knowledge</u>	
Spearman's rho	0.009
Sig. (2-tailed)	0.863

4.6.2 Pearson Chi-Square Correlation

Pearson Chi-Square test of independence was used to test between two categorical data which are BMI and the practice of daytime nap (Turney, 2022). BMI is divided into 4 categories which are underweight (<18.5), normal (18.5 to <25.0), overweight (25.0 to <30.0) and obese (>30.0) (Centers for Disease Control and Prevention, 2022). On the other hand, the practice of daytime nap is categorised as “nappers” for subjects who take daytime nap and “non-nappers” for subjects who do not take daytime nap. Table 4.9 shows the result of Pearson Chi-Square correlation test.

Table 4.9: Results of Pearson Chi-Square Correlation Test

	Practice of Daytime Nap		X² (df)	p-value
	Nappers	Non-Nappers		
	N (%)	N (%)		
<u>BMI</u>			2.699 (3)	0.450
Underweight	67 (74.4)	23 (25.6)		
Normal	145 (66.5)	73 (33.5)		
Overweight	24 (61.5)	15 (38.5)		
Obese	12 (66.7)	6 (33.3)		

4.7 Hypothesis Testing

H₀: 1) There is no significant relationship between the perception and attitude towards the impact of the daytime nap on the risk of brain stroke among non-healthcare undergraduate students in UTAR Sungai Long campus.

H₁: 2) There is significant relationship between the perception and attitude towards the impact of the daytime nap on the risk of brain stroke among non-healthcare undergraduate students in UTAR Sungai Long campus.

The Spearman's correlation test was run between the perception and attitude aspects, and results have shown that there is no significant correlation between the perception and attitude aspects with $p > 0.05$ as shown in Table 4.8. Therefore, the null hypothesis is failed to be rejected.

H₀: 1) There is no significant relationship between the knowledge and attitude towards the impact of the daytime nap on the risk of brain stroke among non-healthcare undergraduate students in UTAR Sungai Long campus.

H₁: 2) There is significant relationship between the knowledge and attitude towards the impact of the daytime nap on the risk of brain stroke among non-healthcare undergraduate students in UTAR Sungai Long campus.

The Spearman's correlation test was run between the knowledge and attitude aspects, and results have shown that there is no significant correlation between the perception and attitude aspects with $p > 0.05$ as shown in Table 4.8. Therefore, the null hypothesis is failed to be rejected.

H₀: 1) There is no significant relationship between BMI and the practice of daytime nap among non-healthcare undergraduate students in UTAR Sungai Long campus.

H₁: 2) There is significant relationship between BMI and the practice of daytime nap among non-healthcare undergraduate students in UTAR Sungai Long campus.

The Pearson chi-square test was run between the BMI and the practice of daytime nap, and referring to Table 4.9, results have shown $X^2 = 2.699$ and $p > 0.05$. Thus, the null hypothesis is failed to be rejected indicating no significant association between the BMI and the practice of daytime nap.

CHAPTER 5

DISCUSSION

5.1 Chapter overview

This chapter will outline the discussion on significant findings from the results sections in accordance with the research objectives, which will then follow with the limitation of study, recommendations for future research as well as the conclusion of the research project.

5.2 Discussion

The purpose of this study is to assess the perception, knowledge, and attitude on the impact of daytime nap on the risk of brain stroke among non-healthcare undergraduate students in UTAR Sungai Long campus. The study has revealed that the perception and attitude of the non-healthcare undergraduate students in UTAR Sungai Long campus was average, skewing toward good whereas the knowledge aspect was average, skewing towards poor indicating the crucial role of education providing factual information regarding daytime nap to enhance their knowledge.

The result of poor knowledge score was anticipated as a study done by Olorunmoteni et. al (2022), also found low scoring on the knowledge of sleep among medical and dental students in Nigeria using the Assessment of Sleep Knowledge in Medical Education (ASKME) questionnaire. The main findings of the systemic review done by Caudwell et. al (2020) was in line with the results of this study where the knowledge domain were poor among the participants due to possible reason of lack of education, however, participants has demonstrated

good attitude towards the importance of sleep health in patient care. Besides, Alrebdi et. al (2019) also found relatively low knowledge among the medical students at Qassim University located in Saudi Arabia using the ASKME questionnaire with 94.8% of the subjects had poor level of knowledge but more than half the sample was observed to have a relatively positive attitude towards sleep medicine. Sleep medicine article was used due to very limited studies were done on daytime nap and daytime nap is also a subdivision of sleep medicine. Based on the study done by Siengsukon et. al (2015), findings have shown that three-quarters of physiotherapist participants were not expose to knowledge on sleep medicine during their studies in the university. Therefore, it is not surprising that non-healthcare undergraduate students have slightly poor knowledge toward the impact of daytime nap on the risk of brain stroke as very limited studies have been done on this topic and limited talks or educational events have been done to promote knowledge in the sleep medicine field especially on daytime nap. Based on the study conducted by Mazar et. al (2021), a group of medical students (n=87) have demonstrated an increase from 11.87 to 14.14 in the mean score of ASKME questionnaire after undergoing education intervention set by the researchers which is attending a lecture regarding the physiology and significance of sleep. Additionally, Al-Qahtani (2019) has found that non-healthcare undergraduate students have demonstrated a better attitude towards practicing a healthy lifestyle when compared to healthcare undergraduate students. However, the study did not assess the knowledge of the subjects regarding their knowledge on healthy lifestyle.

5.2.1 Prevalence of Nappers

In this study, the prevalence of nappers among undergraduate students in UTAR Sungai Long campus was self-reported by a majority of 67.9% of the study sample and 77.8% of them practice daytime nap for 30 minutes and above respectively. In the study done by Hermann et. al (2018) among college students in United States of America found that 64% of students self-reported that they do practice daytime nap for up to 5 times weekly with 34% of the students reported insufficient sleep at night. The study has also reported that lack of sleep may contribute to the practice of daytime nap among college students, however, students who practice long daytime nap were observed to have drop in performance and concentration. Besides, a poor score was obtained when students were asked if they agree on daytime nap for more than 30 minutes will have bad effect on their health which is opposite of the findings of this study where more than half of the subjects disagreed on the statement “long nap(s) are good for health”.

5.2.2 Correlation Between BMI and the Practice of Daytime Nap

The result of Pearson Chi-Square test showed no significant correlation between BMI and the practice of daytime nap ($p>0.05$). In contrast, Chen et. al (2019), findings have shown correlation between BMI and the practice of daytime nap among overweight subjects but not obese subjects

The study done by Sah et. al (2020) has concluded that high BMI individuals are very likely to experience obstructive sleep apnea (OSA) during night-time sleep and it has led to consequences such as fragmentation of sleep and increase in daytime sleepiness. Fragmentation of night-time sleep was found to be a contributing factor of poor sleep quality at night and hypersomnolence. Daytime sleepiness of the subjects were done using the Apnoea Hypopnea Index (AHI) in this study where individuals with higher AHI score showed a higher prevalence of daytime sleepiness. Therefore, abnormally high BMI is associated with daytime sleepiness regardless of the gender leading to a more common practice of daytime nap among high BMI individuals. The possible explanation of insignificant association found between BMI and practice of daytime nap may be due to a smaller number of subjects with abnormal BMI has participated in this study. Besides, this may also indicate a good sign that the overall population in UTAR Sungai Long campus has a healthy normal BMI.

5.3 Limitations of study

There are several limitations in this study that could be improved. Validated self-prepared questionnaire were used in this study with Fleiss Kappa value of 0.58 which indicates moderate reliability of agreement among 5 validators, which is the main strength of the study. However, it should be noted that this self-prepared questionnaire are not appropriate diagnostic instruments but merely self-reporting questionnaires. Besides, the process of data collection was done fully via online platform and self-reporting survey which may be hard for the researcher to obtain clear, precise, and valid responses from the participants as they may face difficulties in understanding the questions asked. Therefore, conducting face-to-face interview or physical survey session would result in more promising and accurate findings.

Moreover, there may be presence of recall bias in this study as questions that requires the participants to remember their usual practice such as their practice of daytime nap which they may overestimate, underestimate, or fail to remember their usual practice.

In addition, the researcher was considering on including the benefits of daytime nap such as the impact of daytime nap on cognitive fitness and sports performance. However, the researcher was looking more towards the negative impact of improper practice of daytime nap as it is not as widely known compared to the benefits and not many studies were done. Therefore, this study aims to sensitize and alter the behaviour of bad daytime nap practice starting from the younger generation which is university students in hope to decrease the risk of developing health issues such as brain stroke, coronary heart disease and diabetes.

Another limitation of this study is regarding the response rate of the participants. The researcher has personally messaged and sent the questionnaire to almost all the students that is reachable through the university's learning platform Microsoft Teams. However, less than 10% of the participants were willing to take their time and responding to the questionnaire leading to possible underrepresentation of certain groups of students that should be taken into consideration. Nevertheless, the research project has reached the targeted sample size and should be sufficient to contribute its findings in a significant manner.

Lastly, it is important to note that the majority of the racial distribution of the students in UTAR Sungai Long campus is Chinese. Therefore, conducting a study in a multiracial country, this study may draw conclusion that may not be applicable to other races or ethnicity as they are significantly underrepresented in the study. Besides, this study was only conducted in one institution focusing on the non-health science undergraduate students, thus, this study may not be generalizable to the general population and further studies can be done with a larger scale of sample size comprising a wider group of population.

5.4 Recommendation for future research

Recommendations for future research include conducting research in physical mode is highly suggested as it may obtain a higher validity of the results when compared to online. This is because the researchers will be able to clarify and explain the questions asked and the type of responses required to shorten and smoothen the data cleaning process. Several gaps also have been identified and suggested in the respective discussion sections which is highly recommended for future researchers to look into.

Moving on, the sample of the population could be expanded to include a higher diversity of students for better representation of the overall population. Therefore, it is recommended for future research to be conducted among multiple higher education institutions which will definitely increase the representation of the overall student population.

Furthermore, future studies can be done using the Epworth Sleepiness Scale to study the general level of daytime sleepiness based on subject's practice of daytime nap.

5.5 Conclusion

In conclusion, the study has found that the general population of non-healthcare undergraduate students in UTAR Sungai Long campus has an average perception, knowledge, and attitude towards the impact of daytime nap on the risk of brain stroke. No significant correlation was established between the perception aspect and attitude aspect as well as between the knowledge aspect and the attitude aspect in this study. Additionally, no significant correlation was found between BMI and the practice of daytime nap due to an uneven distribution among the subjects as majority of the subjects for this study has a normal BMI. Therefore, further studies can be done with a larger sample size focusing on the higher BMI population.

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APPENDIX A – ETHICAL APPROVAL FORM



UNIVERSITI TUNKU ABDUL RAHMAN
Wholly Owned by UTAR Education Foundation (Company No. 578237-06)

Re: U/SERC/224/2022

4 November 2022

Mr Muhammad Noh Zulfikri Bin Mohd Jamali
Head, Department of Physiotherapy
M. Kandiah Faculty of Medicine and Health Sciences
Universiti Tunku Abdul Rahman
Jalan Sungai Long
Bandar Sungai Long
43000 Kajang, Selangor

Dear Mr Muhammad Noh,

Ethical Approval For Research Project/Protocol

We refer to your application for ethical approval for your students' research project from Bachelor of Physiotherapy (Honours) programme enrolled in course UMF3026. We are pleased to inform you that the application has been approved under Expedited Review.

The details of the research projects are as follows:

No	Research Title	Student's Name	Supervisor's Name	Approval Validity
31.	Association of Postural Awareness with Sedentary Behavior and Back Pain During the Hybrid Study Among Undergraduate Students	Low Xin Yuen	Mr Martin Ebenezer Chellappan	4 November 2022 – 3 November 2023
32.	Impact of Social Media Addiction on Physical Activity Among Undergraduate Students	Mak Kai Nan		
33.	Tibial Torsion and Leg Length Discrepancy in Idiopathic Scoliosis Among UTAR Students	Khoo Wan Qi	Pn Nadia Safirah Binti Rusli	
34.	Prevalence of Patellofemoral Pain Among University Students	Khoo Wen Han		
35.	Prevalence of Varicose Veins Among Fast Food Employees in Cheras, Selangor: A Cross Sectional Study	Ropheca Phuah Su Hui		
36.	The Effect of Unstable Modified Wall Squat on Dynamic Balance Among Recreational Athletes	Chu Sin Jiet	Mr Sathish Kumar Sadagobane	
37.	Knowledge, Perception, and Attitude Towards Breast Cancer and Breast Self-Examination (BSE) Among Non-medical Private University Students	Foo Jes Mynn		
38.	Perception, Knowledge and Attitude Towards the Impact of Daytime Nap on the Risk of Stroke Among Non-Healthcare Undergraduate Students: A Cross-Sectional Study	Chan Chi Kuan	Mr Tarun Amalnerkar Co-Supervisor: Ms Swapneela Jacob	
39.	Awareness, Knowledge and Attitude Toward Orthostatic Hypotension Among Elderlies	Ch'ng Hui Kee		

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,

Professor Ts Dr Faiz bin Abd Rahman
Chairman
UTAR Scientific and Ethical Review Committee

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

APPENDIX B – INFORMED CONSENT FORM

Perception, Knowledge and Attitude on the Impact of Daytime Nap on the Risk of Stroke Among Non-Healthcare Undergraduate Students: A Cross-Sectional Study

Dear participants,

You are invited to participate in a research study conducted by CHAN CHI KUAN, from Bachelor of Physiotherapy (Hons) Universiti Tunku Abdul Rahman (UTAR), Sungai Long Campus.

Please read this information sheet and contact me to ask any questions that you may have before agreeing to take part in this study.

Aim of the Research Study:

To determine the perception, knowledge and attitude on the impact of daytime nap on the risk of stroke among non-healthcare undergraduate students in UTAR Sungai Long campus.

The questionnaire consist of 4 sections:

- Section 1: Demographic Data
- Section 2: Perception on the Impact of Daytime Nap on the Risk of Stroke
- Section 3: Knowledge on the Impact of Daytime Nap on the Risk of Stroke
- Section 4: Attitude on the Impact of Daytime Nap on the Risk of Stroke

The questionnaire will take 5-10 minutes to complete.

Risks and Benefits:

There is no known risk involved throughout the current study. The benefits of participating in this study includes increasing your knowledge and attitude on the impact of daytime nap on the risk of stroke.

Confidentiality:

No information that will make it possible to identify you, will be included in any reports to the University or in any publications. Research records will be stored securely and only approved researchers will have access to the records.

Voluntary Nature of the Study:

Participation in this study is voluntary. If you withdraw or decline participation, you will not be penalized or lose benefits or services unrelated to the study. If you decide to participate, you may decline to answer any question and may choose to withdraw at any time.

Contacts and Questions:

If you have any questions, clarifications, concerns or complaints, about the research, the researcher conducting this study can be contacted at:

Name: Chan Chi Kuan
Email: chikuan@1utar.my

APPENDIX C – PERSONAL DATA PROTECTION NOTICE

PERSONAL DATA PROTECTION NOTICE

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.

1. Personal data refers to any information which may directly or indirectly identify a person which could include sensitive personal data and expression of opinion. Among others it includes:

- a) Name
- b) Identity card
- c) Place of Birth
- d) Address
- e) Education History
- f) Employment History
- g) Medical History
- h) Blood type
- i) Race
- j) Religion
- k) Photo
- l) Personal Information and Associated Research Data

2. The purposes for which your personal data may be used are inclusive but not limited to:

- a) For assessment of any application to UTAR
- b) For processing any benefits and services
- c) For communication purposes
- d) For advertorial and news
- e) For general administration and record purposes
- f) For enhancing the value of education
- g) For educational and related purposes consequential to UTAR
- h) For replying any responds to complaints and enquiries
- i) For the purpose of our corporate governance
- j) For the purposes of conducting research/ collaboration

3. 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.

4. 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.

5. 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:

6. By submitting or providing your personal data to UTAR, you had consented and agreed for your personal data to be used in accordance to the terms and conditions in the Notice and our relevant policy.

7. 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.

8. You may access and update your personal data by writing to us at chikuan@1utar.my

Acknowledgement of Notice *


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

Digital Signature (eg: electronically s/d Jamie) *

Your answer

Date of Participation *


Date



[Next](#)

[Clear form](#)

APPENDIX D – RAOSOFT® SAMPLE SIZE CALCULATOR

 Raosoft ®	
What margin of error can you accept? <small>5% is a common choice</small>	<input type="text" value="5"/> %
What confidence level do you need? <small>Typical choices are 90%, 95%, or 99%</small>	<input type="text" value="95"/> %
What is the population size? <small>If you don't know, use 20000</small>	<input type="text" value="6479"/>
What is the response distribution? <small>Leave this as 50%</small>	<input type="text" value="50"/> %
Your recommended sample size is	363

APPENDIX E – QUESTIONNAIRE FORM (DEMOGRAPHICS)

1. Name (optional)

Short answer text
.....

2. Age *

- Below 18
- 18-20
- 21-23
- 24-26
- 27 and above
-

3. Weight (kg) *

Short answer text
.....

4. Height (in m) *

For example: 163cm = 1.63m

Short answer text
.....

5. Email *

Short answer text
.....

6. Which campus are you from? *

- Kampar campus
- Sungai Long campus

7. Which level of study are you currently pursuing? *

- Foundation
 - Undergraduate
 - Postgraduate (Masters / PhD)
-

8. Mode of Study *

- Part-time
 - Full-time
-

9. Major of study *

- Health science (MK FMHS)
 - Non-health science
-

10. Faculty *

- Faculty of Creative Industries (FCI)
 - Faculty of Accountancy and Management (FAM)
 - Lee Kong Chian Faculty of Engineering and Science (LKC FES)
-

APPENDIX F – PERCEPTION TOWARDS THE IMPACT OF DAYTIME NAP ON THE RISK OF BRAIN STROKE

1. Long daytime nap(s) are good for health. *

- Strongly Agree
 - Agree
 - Disagree
 - Strongly Disagree
-

2. A person takes daytime nap(s) because of poor sleep quality at night. *

- Strongly Agree
 - Agree
 - Disagree
 - Strongly Disagree
-

3. Daytime nap(s) can affect the hormonal level in the body. *

- Strongly Agree
 - Agree
 - Disagree
 - Strongly Disagree
-

4. Taking daytime nap(s) can affect blood pressure. *

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree

5. Long daytime nap(s) can cause brain strokes. *

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree

6. It is hard to fall asleep at night after taking daytime nap(s). *

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree

APPENDIX G – KNOWLEDGE ON THE IMPACT OF DAYTIME NAP ON THE RISK OF BRAIN STROKE

1. Do you take daytime nap(s) in a day? *

If yes, please proceed to question 2.

If no, please proceed to question 5.

Yes

No

2. How long do you take daytime naps in a day? *

Less than 30 minutes

More than 30 minutes

I don't take nap

3. When do you usually take daytime nap(s)? *

Before 2pm

After 2pm

I don't take nap

4. Do you know daytime nap(s) can be because of poor sleep quality at night? *

Yes

No

5. Do you know that daytime naps can increase the risk of brain stroke? *

Yes

No

APPENDIX H – ATTITUDE TOWARDS THE IMPACT OF DAYTIME NAP ON THE RISK OF BRAIN STROKE

1. I feel more tired after I wake up from daytime nap(s). *

- Strongly Agree
 - Agree
 - Disagree
 - Strongly Disagree
-

2. I will stop taking daytime nap(s) if I know it may increase the risk of brain stroke. *

- Strongly Agree
 - Agree
 - Disagree
 - Strongly Disagree
-

3. I wish to know more about the dangerous effects of daytime nap(s). *

- Strongly Agree
 - Agree
 - Disagree
 - Strongly Disagree
-

4. I wish to know more about the benefits of daytime nap(s). *

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree

APPENDIX I – PHAMPLET FOR PARTICIPANTS

The Benefits

Here are some benefits when you take 5-20 minutes of daytime nap!

- 01 May boost memory
- 02 May improve physical performance
- 03 May ↑ concentration
- 04 May ↑ energy level
- 05 May induce relaxation / may reduce stress
- 06 May improve mood



PRACTICE A HEALTHY HABIT OF DAYTIME NAP



Do you know, improper practice of daytime nap can be dangerous to your health!

The Dangers

Here are some possible dangerous effect when you take daytime nap for MORE THAN 30 minutes

- 01 May ↑ blood pressure
- 02 May cause poor sleep quality at night
- 03 May ↑ inflammation (↑ C-Reactive Protein)
- 04 May ↑ risk of stroke
- 05 May ↑ risk of diabetes
- 06 May induce sleep inertia



Disclaimer: This poster does not provide any medical advice. The information, including but not limited to, text, graphics, images and other material contained on this poster are for informational purposes only. No material on this poster is intended to be a substitute for professional medical advice, diagnosis or treatment. Always seek the advice of your physician or other qualified healthcare provider with any questions you may have regarding a medical condition or treatment. Never disregard professional medical advice or delay in seeking it due to something you have read on this poster.

APPENDIX J – TURNITIN REPORT

Nap Sleep

ORIGINALITY REPORT

8%	6%	3%	2%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to Universiti Tunku Abdul Rahman Student Paper	<1%
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