รายงานวิจัยฉบับสมบูรณ์

ความวิตกกังวลกับคุณภาพการนอนในมหาวิทยาลัยบูรพา ประเทศไทย พ.ศ. ๒๕๖๒
Depression and Insomnia in Burapha University, Thailand 2019

เภสัชกร รองศาสตราจารย์ ดร.ฐิตินันท์ เอื้ออำนวย

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กิติกรรมประกาศ

บทคัดย่อ

วัตถุประสงค์: 1. เพื่อเปรียบเทียบคุณภาพการนอน กับ ภาวะซึมเศร้า ระหว่างอาจารย์ นิสิต และพนักงาน ของมหาวิทยาลัยบูรพา 2. เพื่อเปรียบเทียบคุณภาพการนอน กับ ภาวะซึมเศร้า ระหว่างชายกับหญิง ของ มหาวิทยาลัยบูรพา 3. เพื่อหาความสัมพันธ์ระหว่างภาวะซึมเศร้า กับ คุณภาพการนอน 4. สำรวจการใช้ยา ช่วยในการนอนกับยาลดภาวะซึมเศร้าที่มหาวิทยาลัยบูรพา วิธีวิจัย: การวิจัยภาคตัดขวางระยะสั้นแบบสำรวจ ที่มหาวิทยาลัยบูรพาเมื่อ พศ. 2562. บุคลากรองมหาวิายาลัยบูรพาแบ่งออกเป็น 3 กลุ่มคือ อาจารย์ นิสิต และ พนักงาน กลุ่มตัวอย่าง 243 คนคำนวณจากตาราง Jacob Cohen หน้า 384 เมื่อ α =0.05, β=0.20, power=0.80, effect size=0.20, ได้ตัวอย่างกลุ่มละ 81 คน, สุ่มแบบโควต้า, เครื่องมือที่ใช้คือ Pittsburgh sleep quality index (PSQI) เป็นแบบสอบถามที่ให้ตอบเองเพื่อวัดคุณภาพการนอนและสิ่งรบกวน 2 สัปดาห์ แบบสอบถามมี 7 มิติ ประกอบด้วย 19 ตัวแปร, ภาวะซึมเศร้าวัดโดย Hamilton Depression Rating Scale (HAM-D), ผลการวิจัย 243 คน (100%) ตอบแบบสอบถามอย่างสมบูรณ์, ค่า Cronbach's Alpha ของ PSQI และ HAM-D วัดได้ 0.74 และ 0.78 ตามลำดับ, หญิง 142 คน (58.44%) ชาย 101 (41.66%) คน, คะแนนเฉลี่ยของคุณภาพการนอนของ อาจารย์ นิสิต และ พนักงาน คือ 6.78>6.74>6.50 ตามลำดับ ไม่ต่างกันอย่างมีนัยสำคัญ (p=0.124, ANOVA). แต่คะแนนคุณภาพการนอนของทั้ง 3 กลุ่ม >5, แปลว่า นอนไม่หลับอย่างอ่อน. คะแนนเฉลี่ยของภาวะซึมเศร้าของ อาจารย์ นิสิต และ พนักงาน คือ 7.43>7.10>6.46 (p=0.174, ANOVA),ภาวะซึมเศริองทั้ง 3 ลุ่ม ไม่แตกต่างกันอย่างมีนัยสำคัญ แต่มีคะแนน >7, ทั้ง 3 กลุ่มมีภาวะซึมเศร้าอย่างอ่อน, คะแนนเฉลี่ยของคุณภาพการนอนของ หญิงกัยชาย คือ 6.47>6.14 (p=0.047* ANOVA). ชายมีคุณภาพการนอนดีกว่าหญิง อย่างมีนัยสำคัญ แต่คะแนนคุณภาพการนอนของทั้ง ชายและหญิง >5, แปลว่า ทั้งสองเพศนอนไม่หลับอย่างอ่อน, คะแนนเฉลี่ยของภาวะซึมเศร้าของ หญิงกับชาย คือ 7.71>6.12. (p=0.023* ANOVA), หญิงมีภาวะซึมเศร้ามากกว่าชายอย่างมีนัยสำคัญ แต่ทั้งสองเพศมี คะแนน >7, ทั้งหญิงและชายมีภาวะซึมเศร้าอย่างอ่อน. Pearson's Correlation พบความสัมพันธ์อย่างมี นัยสำคัญในทางบวกระหว่างภาวะซึมเศร้ากับคุณภาพการนอน (P=0.024*, r=+0.536, R^2=0.287). ยิ่ง ซึมเศร้ายิ่งนอนไม่หลับ, ยาที่ช่วยในการนอนที่ใช้มากสามชนิดได้แก่ Lorazepam 0.5 มก., Lorazepam 1 มก., และ Clonazepam 0.5 มก. มีการใช้ยาเหล่านี้ 4.45%, 2.06% และ 65% ตามลำดับ ยาที่ช่วยลดภาวะ ซึมเศร้าที่ใช้มากสามชนิดได้แก่ Amitriptyline 10 มก., Fluoxetine 20 มก. และ Clonazepam 0.5 มก. สรุป คุณภาพการนอน กับภาวะซึมเศร้าของอาจารย์ นิสิต และพนักงานในมหาวิทยาลัยบูรพาไม่แต่ต่างกัน อย่างมีนัยสำคัญ แต่ คุณภาพการนอนชาย ดีกว่าหญิง ส่วนหญิงมีภาวะซึมเศร้ามากกว่าชาย, ภาวะซึมเศร้ากับ คุณภาพการนอนกับมีตวามสัมพันธ์กันในทางบวก ยิ่งซึมเศร้ายิ่งนอนไม่หลับ

กุญแจคำ: คุณภาพการนอน, การนอนไม่หลับ, ภาวะซึมเศร้า

Abstract

Objectives: 1. To compare quality of sleep (insomnia) and depression between lecturers, student and employees at Burapha University. 2. To compare quality of sleep (insomnia) and depression between female and male at Burapha University. 3. To investigate relationship between depression and quality of sleep. 4. To explore drugs prescribe for quality of sleep (insomnia) and depres at Burapha University. Method: A cross-sectional survey study was conducted at Burapha University in Chonburi, Thailand in 2019. There were three groups of people in Burapha University-lecturer, student and employee. N=243, sample size was calculated by Jacob Cohen's table page 384, α =0.05, β=0.20, power=0.80, effect size=0.20, yielded n = 81 (in each group). Samples were randomly selected using quota sampling method. Instruments: Sleeping quality was measured by the validated Pittsburgh sleep quality index (PSQI). A self-rated questionnaire which assesses sleep quality and disturbances over a 2-weeks-time interval. This scale consisted of 7 constructs (19 observed variables). Depression was measured by The Hamilton Depression Rating Scale (HAM-D) Results: 243 (100%) questionnaires were completely collected. Cronbach's Alpha for PSQI and HAM-D were 0.74 and 0.78 respectively. 142 (58.44%) were female and 101 (41.66%) were male. The means of insomnia of lecturer, student and employee were 6.78>6.74>6.50. It was not significantly different (p=0.124, ANOVA). Lecturer, student and employee group score were >5, all three groups were in mild insomnia. The means of depression of student, lecturer and employee were 7.43>7.10>6.46 (p=0.174, ANOVA). Three groups were not significantly different in depress. Depression of all three groups were >7, they were in mild depress stage. The means of insomnia score of female and male were 6.47>6.14 (p=0.047* ANOVA). Men quality of sleep was better than women however both scores were >5, both gender were in mild insomnia stage. The means of depression of female and male were 7.71>6.12. (p=0.023* ANOVA). Women were significantly more depress than men. Pearson's Correlation confirmed a significant positive linear relationship between depression and quality of sleep (insomnia) (P=0.024*, r=+0.536, R^2=0.287). The more depress the more insomnia. Three major drugs used for insomnia were Lorazepam 0.5 mg, Lorazepam 1 mg, and Clonazepam 0.5 mg: 4.45%, 2.06% and 1.65% respectively. Three most prescribed drugs for depress were: Amitriptyline 10 mg, Fluoxetine 20 mg. and Clonazepam 0.5 mg. Conclusions: Quality of sleep and depress of lecturers, students and employees in Burpha University were not significantly different. However, Quality of sleep of men was better than women and women were more depress than man. Depress significantly positively correlated with insomnia. The more depress they were, the lower quality of sleep they had.

Key words: Quality of sleep, Insomnia, Depression

Table of Contents

List of Tables

List of Figures

CHAPTER I

Quality of sleep (Insomnia) was defined as a complaint of poor or unsatisfactory sleep with associated severe distress, as well as social, interpersonal, and occupational impairment [1–4]. High levels of depression were frequently evident in people with insomnia [5], there were also high rates of sleep disturbances in people with depressive disorders [6]. In sum, this implied there is an intriguing interrelationship between depression and insomnia. An improved understanding of the relationship between depression and quality of sleep might provide for a detailed understanding of problems and guidelines on the tailoring of interventions to different stages of depression and quality of sleep (insomnia) development.

WHO estimates that over 7% of Thai have moderate or severe depress. The severity and symptoms of depression vary, but the most common include: Feelings of despair, hopelessness, sadness, Frequent or occasional thoughts of death or suicide, Difficulty concentrating, Lower energy, Lower libido, Reduced self-esteem, Weight gain or loss, Loss of interest in activities the person formerly enjoyed, Excessive daytime sleepiness, Quality of sleep (Insomnia) [7].

Quality of sleep (insomnia) was measured by the validated Modified Pittsburgh sleep quality index (PSQI)-a self-rated questionnaire which assessed quality of sleep (insomnia) and disturbances over a 2-weeks-time interval. The questionnaire consists of 7 constructs, 19 observed variables namely: 1) Subjective sleep quality; 2) Sleep latency; 3) Sleep duration; 4) Habitual sleep efficiency; 5) Sleep disturbances; 6) Use of hypnotic agent; and 7) Daytime dysfunction. The 7 component composite scores were then summed up to produce global PSQI scores which range between 0 and 210 [8].

Quality of sleep (Insomnia): Sleep problems were the core symptoms of depression. Both depression and severe sleep problems were the major risk factors for suicide and health problems liked heart disease, other mental disorders, and smoking habitual. People with depression had trouble being productive in work or school, which could impact their career and social life. The sleep issues were often one of the reasons depressed people seek out professional help [9].

Anyone could become depressed, but it affected some people more than others, particularly women and adults in middle age. Coincidentally, these two groups were also more likely to have insomnia. There was correlation between age and depression as well as the disproportionate prevalence between the genders [10].

There was a cyclical relationship between depression and sleep. The sleep problems brought on by depression – or the ones that caused it in the first place – made it much more difficult to get better. Sleep deprived people had stronger emotional reactions in general, so it's tougher to regulate the emotional volatility associated with depression. Abnormal sleep interfered with mood and energy levels during the day, so it's difficult to stay motivated to engage with others, exercise, and even go to work. To cope, people who were depressed may self-isolate, which could lead to more sleep problems. Loneliness itself associated with fragmented sleep. The cause-and-effect ran both ways. Even if you're not depressed, lack of sleep increased your chances of depression and other mental illnesses. Depression caused insomnia and hypersomnia. An article in the Journal Sleep reported that children with both insomnia and hypersomnia were more likely to be depressed, to be depressed for longer periods of time, and to experience additional problems such as weight loss. Particularly for

young adults, there was a strong correlation between insomnia and major depressive disorder. Genes involved in the molecular clock and circadian cycle was known to be involved with bipolar disorder.

Quality of sleep (insomnia) was also defined as difficulty falling or staying asleep at least three nights a week for three months or more. This was considered chronic insomnia, experienced by about half of the people with insomnia. The other half experience one of the disorder in the other forms, most likely short-term insomnia. Short-term insomnia was defined as insomnia that lasts less than three months. Other types of insomnia include sleep-onset insomnia, or difficulty falling asleep, and sleep-maintenance insomnia, or trouble staying asleep. The symptoms of insomnia included tiredness, low energy, forgetfulness, and poor mood. Other insomnia symptoms include: feeling fatigued, lack of focus and concentration, weight gain, lack of balance and coordination and depression.

Quality of sleep decreased the risk of other potentially life-threatening health conditions, including: obesity, diabetes, cardiovascular disease, heart attack and stroke, anxiety and depression, alcohol abuse.

Insomnia also negatively impacted decision-making and reaction times, increasing the risk of accidents. People experiencing insomnia were 2.8 more likely to die in a car crash. Insomnia affected men, women and children throughout life, though people over 65 have a higher risk of developing insomnia. Women had higher rates of insomnia than men, and pregnancy could trigger insomnia in some women, thanks to higher levels of the hormone progesterone, which disrupted sleep patterns.

Healthcare providers used the terms primary insomnia and secondary insomnia to differentiate the causes of insomnia. Primary insomnia was insomnia that wasn't connected to a medication or another medical condition. Secondary insomnia was insomnia that results from the effects of another health condition, illness, or medication. Research showed a genetic component to insomnia, so if your parents or other immediate relatives experience insomnia, you might be more likely to struggle with sleep. Fatal familial insomnia was an extremely rare inherited neurodegenerative disorder. Symptoms usually begin between age 32 and 62 and included dementia, insomnia, weight loss, abnormally high or low body temperature and panic attacks.

Though insomnia sometimes appeared to have no clear cause, some conditions appeared to increase the risk of developing insomnia. Depression and anxiety, family member with insomnia, Chronic pain, Poor mental health, Low extraversion, Some chronic health conditions could increase the risk of insomnia, including: Alzheimer's disease, Parkinson's disease, Heart disease, Diabetes, Sleep apnea, Restless legs syndrome, Fibromyalgia, Kidney disease, Lung disease, Arthritis, Upper respiratory illness/allergies, Gastrointestinal reflux disease (GERD), Certain medications can increase the risk of insomnia. Insomnia resulting from medications is referred to as secondary insomnia. These medications include: Selective serotonin reuptake inhibitors (SSRI antidepressants including Prozac, Paxil and Zoloft), Amphetamines (including Adderall), Dopamine agonists (including some medications used to treat Parkinson's), Anticonvulsants, Niacin, Steroids, Beta agonists, Theophylline, Medications to lower blood pressure, Cold medicines and decongestants, Diuretics, Appetite suppressants Additionally, using caffeine, nicotine, or alcohol could cause or worsen quality of sleep.

Quality of sleep (insomnia) was linked to a number of other health disorders, from heart disease to arthritis. People experiencing insomnia had a significantly increased risk of developing depressive disorder. Chronic pain and increased pain sensitivity were also linked to insomnia.

Depression: According to The Wikipedia, Depression (mood), is a state of low mood and aversion to activity. Mood disorders characterized by depression are commonly referred to as simply depression, including: Feelings of despair, hopelessness, sadness, Frequent or occasional thoughts of death or suicide, Difficulty concentrating, Lower energy, Lower libido, Reduced self-esteem, Weight gain or loss, Loss of interest in activities the person formerly enjoyed, Excessive daytime sleepiness.

The symptoms of depression were persistent and pervade all aspects of an individual's' life, from work and play to basic needs like eating and sleeping. Within the larger category of depression, there were several different types of depression which come with their own sleep problems.

This research aimed to investigate 2 important concepts. Those were "Quality of sleep" (insomnia) and "depression" of the people at Burapha University 2019.

The objectives of this study were:

1. To compare quality of sleep (insomnia) and depression between lecturers, student and employees at Burapha University.
2. To compare quality of sleep (insomnia) and depression between female and male at Burapha University.
3. To investigate relationship between depression and quality of sleep.
4. To explore drugs prescribe for quality of sleep (insomnia) and depression at Burapha University.

Chapter II

Literature review

In the year 2016 Kim WH., at al [11] studied the relationship between insomnia and cognitive dysfunctions in 1,740 elderly individuals (age 65 and up) in South Korea. Kim found that Insomnia was a very common complaint in the elderly with SMI, MCI, and dementia. Depression played an important factor in the relationship between insomnia and cognitive dysfunctional status in the elderly.

HoL Loway, K.L (2016) [12] investigated Anxiety disorders and falls among older adults in 487 men and 376 women aged ≥60 years old in Australia using survey study by face to face interview. The researchers found association between anxiety and falls. Anxiety disorder was associated with falling (OR 2.96; 95%CI 1.07–8.21). The results aided in prevention of falls through specific interventions aimed at reducing anxiety, particularly in men.

Delphin-Combe, F. (2016) [13] investigated the relationship between the level of anxiety and cognitive performance in 149 patients (age 65 years old or older) complaining of memory difficulties. Anxiety level was assessed with the Hamilton Anxiety Rating Scale. Subjects with moderate to severe anxiety had worse performance than subjects with no anxiety. They found relationship between anxiety and executive, visual-constructive or instrumental functions.

Agmon, M. (2016) [14] tested the association between anxiety at the time of hospitalization and falls occurring within one month of discharge. One-month, prospective cohort study of 556 older adults in two medical centers in Israel were observed. Anxiety and functional decline were assessed during hospitalization and falls were assessed one month post-discharge. They concluded anxiety at time of hospitalization was associated with falls 30-days post-discharge, when controlled for several well-known confounders.

Yu, J. et al [10] (2016) [15] set a survey study to investigate the association between sleep and psychiatric symptoms in elderly Asian populations. They examined the sleep correlates of depression and anxiety in a sample of cognitively healthy older adults using The Geriatric Depression Scale, Geriatric Anxiety Inventory (GDSGAI), and the Pittsburgh Sleep Quality Index (PSQI) in the 107 sample of elderly participants. GDSGAI scores were both significantly correlated with sleep disturbance. GDSGAI associated with daytime dysfunction, and sleep quality, sleep latency, and PSQI. Yu concluded that depression and anxiety in a cohort of elderly Asian subjects were associated with a number of sleep-related issues.

Peluso, É.T.P [11] (2016) [16] did assess the prevalence of anxiety and depression disorders in elderly with chronic dizziness of vestibular origin. They used the Brazilian version of the Composite International Diagnostic Interview 2.1 to assess anxiety and depressive disorders in elderly patients (≥60 years old) with chronic dizziness. They found that most of the 44 patients included in the study were female (88.6%) with a mean age of 71 years (±7.5), 68.1% had experienced dizziness for 1 year or more. The most prevalent diagnosis was benign paroxysmal positional vertigo (52.3%). The prevalence of generalized anxiety disorder and specific phobias during life were 29.5% and 22.7%,

respectively, and, in the last 12 months, 18.2% and 15.9%. There was no patient with panic disorder, agoraphobia or social phobia. The prevalence of depressive disorder during life was 45.4%, and, in the last 12 months, were 11.3%. Peluso confirmed aged patients with chronic dizziness had high prevalence of some mental disorders.

Kang, H.J.[12] (2016) [17] investigated the prevalence, incidence, and persistence of anxiety and related factors over a two-year period in community-dwelling 909 Korean elderly individuals. They used the community version of the Geriatric Mental State Schedule was to estimate anxiety at both baseline and follow-up interviews. Associations between various covariates and anxiety status were examined using multivariate logistic regression models. Kang found anxiety symptoms were associated independently with female, rented housing, more stressful life event and medical illness, physical inactivity, depression, insomnia, and lower cognitive function. Incident anxiety symptoms were predicted by older age, female gender, depression, and insomnia. Persistent anxiety symptoms were predicted by older age, more medical illness, and baseline depression. Finally, they concluded that depression was associated with prevalent, incident, and persistent anxiety symptoms, effective detection and management. It was important in the older adults to reduce anxiety. They also suggested that preventive collaborative care should be implemented, particularly for older, female, insomniac patients.

Van Dijk, S.D.M (2016) [18] studied comparative personality profile of older patients suffering from medically unexplained symptoms (MUS) with two comparison groups and one control group. 96 older patients with MUS were compared with 153 frequent attenders in primary care suffering from medically explained symptoms (MES), 255 patients with a past-month depressive disorder and a control group of 125 older persons. The Big Five personality domains (NEO-Five-Factor Inventory) were compared between groups by multiple ANCOVA as adjusted for age, sex, education, partner status and cognitive functioning. They found that the four groups differed with respect to neuroticism ($P<0.001$), extraversion ($P<0.001$), and agreeableness ($P<0.050$). Post hoc analyses, showed that MUS patients compared to controls scored higher on neuroticism and agreeableness, and compared to depressed patients lower on neuroticism and higher on extraversion as well agreeableness. Interestingly, MUS and MES patients had a similar personality profile. Health anxiety and somatization were associated with a higher level of neuroticism and a lower level of extraversion and conscientiousness, irrespective whether the physical symptom was explained or not. They found that older patients with MUS have a specific personality profile, comparable to MES patients. Linear regression analyses were also applied to inspect the significant correlation between health anxiety (Whitley Index) and somatization (Brief Symptom Inventory) ($P<0.01$).

Darban, F. (2016) [19] studied relationship between social intelligence and death anxiety to find factors influencing the health in elderly populations in 100 elderly subjects in Iran. A cross-sectional survey study used Templer's Death Anxiety Scale and the Tromso Social Intelligence Scale. Social intelligence had a negative relationship with the death anxiety ($p > 0.05$).

In 1988, Daniel J. used the Pittsburgh Sleep Quality Index as a new instrument for psychiatric Practice and Research to measure the sleep quality of clinical populations. The subjects were divided into three groups: 52 healthy good sleepers (Group1), 34 poor sleepers with major depressions (Group2), and 62 poor sleepers with Disorder of initiating and Maintaining Sleep (DIMS, n=45) or Disorders of excessive somnolence (DOES, n=17).

Results showed an acceptable measures of internal homogeneity, consistency (test-retest reliability), and validity were obtained. A global PSQI score >5 yielded a diagnostic sensitivity of 89.6% and specificity of 86.5% (kappa=0.75, p <0.001) in distinguishing good and poor sleepers. The clinimetric and clinical properties of the PSQI suggest its utility both in psychiatric clinical practice and research activities. [20]

In 2007, Manote Lotrakul et al, used Thai version of the PHQ-9, Thai version of Mini International Neuropsychiatric Interview (MINI), and Thai version of Hamilton Rating Scale for Depression (HAM-D) to investigate Reliability and validity of the Thai version of the PHQ-9 in 1,000 cases of outpatients from primary care clinic of the department of family medicine, Ramathibodi Hospital, Bangkok between October 2006 to February 2007. The PHQ-9 was then administered among 1,000 patients in family practice clinic. Of these 1,000 patients, 300 were further assessed by the Thai version of the Mini International Neuropsychiatric Interview (MINI) and the Thai version of the Hamilton Rating Scale for Depression (HAM-D).The results showed that Thai version of the PHQ-9 has acceptable psychometric properties for screening for major depression in general practice with a recommended cut-off score of nine or greater. However, the further clinical assessment was recommended on the grounds that the categorical algorithm of the PHQ-9 yielded low sensitivity. It was less suitable for a screening purpose [21].

In 2011, Fadia Isaac et al, investigated the relationship between insomnia and depressive symptoms by using BDI-II and PSQI. The objectives of this study was to analyze the association of cognitive and somatic factors and to figure out whether the treatment of insomnia in the depression with insomnia would decrease the depression symptoms or somatic or cognitive of depressive symptoms. The results showed that insomnia may be first leading step to depressive symptoms. They concluded the treatment of insomnia alone may also help with the depressive symptoms [22].

In 2014, Elizabeth C. Mason and Allison G. Harvey studied insomnia symptoms before and after treatment of anxiety and depression in 266 patients. Insomnia Severity Index was used to present insomnia. 102 of them used the iCBT. The results showed that over the treatment there was no change of their total sleep time. They prove that treatment of anxiety or depression might help with insomnia symptoms but might be ineffective in total sleep time [23].

In 2017, Shou Pan et al, used the Hamilton Depression Rating scale (24-items) to predict the diabetic microvascular complications in type 2 diabetics mellitus in 288 hospitalized patients. The results showed that HAM-D$_{24}$ score were significantly greater than the patients without diabetic microvascular complications. Shou Pan et al, confirmed that applying the HAM-D$_{24}$ when the patients with T2DM were admitted would be useful for them [24].

In 2017, Ping-Jen Chen et al, studied the long-term effects of relapsed insomnia in Taiwanese participants from a population-based 4-year cohort study on the following progression of anxiety and depression during a 4-year follow-up. ICD-9-CM was used to present the database. He further classified insomnia into groups to figure out whether the risk of anxiety and depression varies by subtype. The findings emphasized the important part of insomnia in the future onset of anxiety and depression [25].

In 2017, Thaís de Rezende Bessa Guerra et al, did a research on a cross-sectional study. It was a consecutive sample about Methods of Screening for Depression in Outpatients with heart failure to study the prevalence of depression and the agreement among screening methods for depression in patients with heart failure in 76 outpatients patients from multidisciplinary program of a clinic specialized in heart fail, they employed the Hamilton Depression Rating Scale (HAM-D), Beck Depression Inventory-II (BDI-II), and Patient Health Questionnaire-9 (PHQ-9) to screen the depression. The result found that the prevalence of depression associated with HF; 1) depression had a relevant prevalence in outpatients with heart failure; 2) the diagnosis and detection of depression were obtained through the use of questionnaires in outpatients with heart failure; 3) the three questionnaires evaluated had a superficial agreement and moderate consistency in the diagnosis of depression in the population with heart failure; 4) the HAM-D scale proved to be the best instrument in diagnosing depression, since it showed greater accuracy and sensitivity, and a lower percentage of false-negative results; 5) the PHQ-9 instrument was conservative in diagnosing depression, with a high percentage of false negative results and low sensitivity to identify patients who were in fact depressed. However, further research was required [26].

In 2018, Melanie N. Schneider et al, studied the magnitude and the effects of genetic and environment and on mindfulness, symptoms of insomnia, depression, and anxiety in twin/sibling adults (22 to 32 years old). Five Factor Mindfulness Questionnaire (FFMQ) was used to present Mindfulness. They found that 'non-judging of inner experience' was the subscale of the mindfulness that mostly associated with symptoms of insomnia, depression and anxiety. Further study on the subscales of mindfulness could help with mindfulness-based in the future [27].

In 2018, Petros Petrikis et al, studied the quality of life, fatigue, stress, and depression in 131 caregivers of patients with Multiple Sclerosis, and to identify further relationship between the factors and the characteristics of caregivers (age, gender, affinity with the patient, duration of caregiving, income, education, and hobbies and the severity of the patient disability. I was done at the Department of Neurology, University Hospital of Ioannina, Greece from October 2015 to March 2017. 36-item Short Form Health Survey (SF-36) was used to assess the quality of life of the caregivers. Krupp Fatigue Severity Scale (FSS) was used to evaluate the fatigue. Kingston caregiver stress Scale (KCSS) was used to measure Stress. Hamilton Scale for Depression (HAM-D) was used to assess depression of caregivers. This study used linear regression models to analyze the relationships of KCSS with both the HAM-D and SF-36 and mental component summary. The regression showed that fatigue was positively related with stress and negatively related with both physical health status and mental health status. Stress was positively related with depression and negatively related with both physical health status and mental health status. Depression was negatively related with both caregiver physical health status and mental health status. In multivariable logistic regression analysis, fatigue was independently correlated with education status, history of chronic disease, other chronic diseases in the family, and the disability status of the patient [28].

In 2018, Muhammad Irfan et al, conducted a cross-sectional study to investigate psychological distress in terms of depression, anxiety, social dysfunction, depressive and somatic symptoms among 1334 (745 (55.8%) were males and 589 (44.2%) were females) students appearing for medical school entrance examination at Peshawar Medical College, Peshawar, Pakistan, from August 2015 to May 2016. General Health Questionnaire was used to assess the psychological distress. Those who scored 24 or more on the GHQ and were

called for the entrance interview were further assessed depression by Hamilton Rating Scale. The mean age was 18.9 ± 1.41 years and 182 (13.6%) subjects had psychological distress. On the four subscales of the questionnaire, 472 (35.4%) students had somatic symptoms, 560 (42%) had anxiety/insomnia, 819 (61.4%) had social dysfunction and 323 (24.2%) had depressive symptoms. Amongst the 322 (24%) students who were called for interviews, 73 (22.7%) had psychological distress based on the questionnaire and 9 (2.8%) had depression detected by the Hamilton scale. There was a significant correlation between female gender and psychological distress based on the questionnaire scores ($p < 0.05$). Among those who had both the assessments, there was no significant gender ($p > 0.05$) [29].

In 2018, Oluremi A. et al, conducted a study of factor analysis to shorten the Pittsburgh Quality Sleep Index (PSQI) for young adults. 19-item PSQI was shortened to 13 items. Short PSQI data from 1246 college freshmen across eight university were used. The findings revealed that short PSQI correlated and agreed with the original survey and could potentially be used to give the same result with reducing the time for participant to complete the surveys. The short PSQI was more attractive for younger adults with limit time [30].

In 2019, Caijun Dai et al, performed a cross-sectional study to compare the sleep quality and depressive symptoms in 865 Chinese nurses working night shifts only and with day shifts only. The relationship between sleep quality and depressive symptoms was analyzed. This study started from June to October 2017 in Jinhua Municipal Central Hospital in Zhejiang Province (Southern China). Pittsburgh Sleep Quality Index (PSQI) and Hospital Anxiety and Depressive Disorders Rating Scale (HADS) were used to assess the sleep quality and depressive symptoms. Nurses working night shifts had significantly higher PSQI and HADS scores than nurses working day shifts only ($p < 0.05$). There was a positive association between PSQI and HADS scores. Binary logistic regression showed that night shift and poor sleep quality were independent risk factors of depressive symptoms among nurses. Higher rates of depression among Chinese nurses working night shifts were associated with poor sleep quality induced by night shift [31].

Conceptual Framework
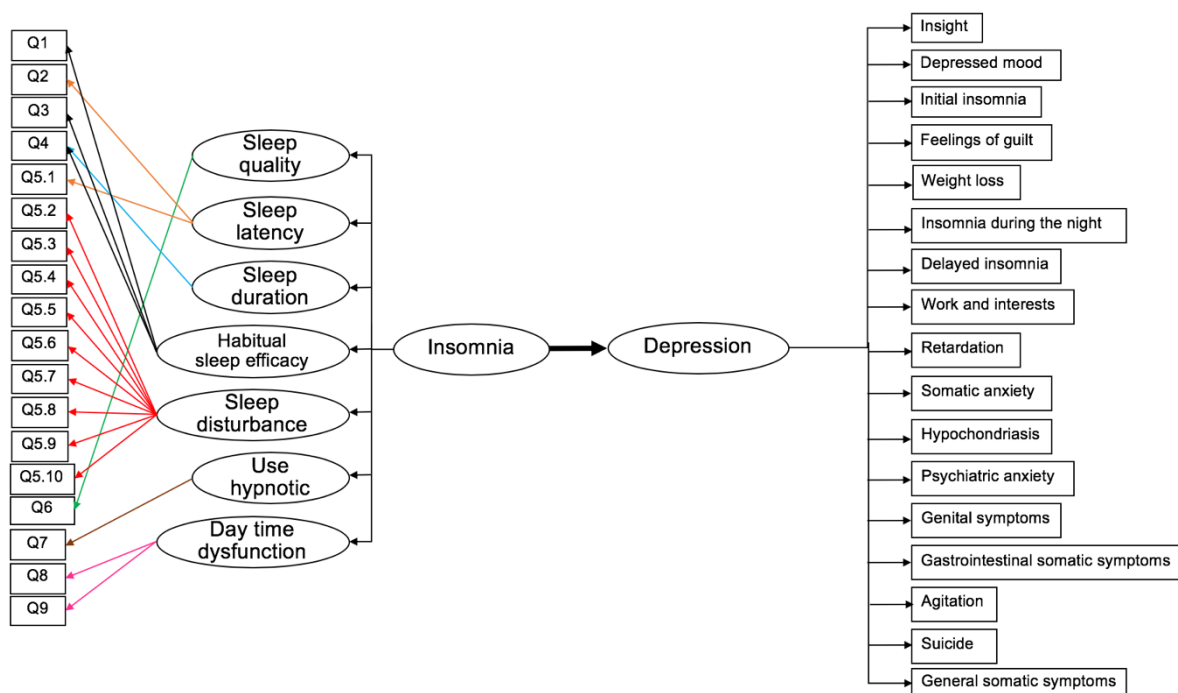
This study aimed to investigate relationship of Quality of Sleep (Insomnia) and Depression. The concept of Quality of Sleep (Insomnia) was measured by Pittsburgh sleep quality index (PSQI) and Depression concept was measured by The Hamilton Depression Rating Scale (HAM-D).

Pittsburgh sleep quality index (PSQI) was a self-rated questionnaire which assesses sleep quality and disturbances. This scale consisted of 7 -19 observed variables-namely: 1) Subjective sleep quality; 2) Sleep latency; 3) constructs Sleep duration; 4) Habitual sleep efficiency; 5) Sleep disturbances; 6) Use of hypnotic agent; and 7) Daytime dysfunction. Each component was assessed using four-point Likert scale to yield a ratio scale for a higher power statistics outcome.

Poor sleep quality was defined as scores greater than 5, and good sleep quality was defined as scores of 5 and below.

Depression concept was measured by the Hamilton Depression Rating Scale (HAM-D). It was developed by Matthew Chow [9]. It was the most commonly used instrument for assessing symptoms of depression. It was used in many key studies of depression and its treatment. The instrument was designed to be administered by clinicians after a structured or unstructured interview of the patient to determine their symptoms. A total score is calculated by summing the individual scores from each question. It was generally used to screen for the presence of symptoms of depression and anxiety (psychological depress). HAM-D consisted of 17 observed variables namely: 1) Insight; 2) Depressed mood; 3) Initial insomnia; 4) Feelings of guilt; 5) Weight loss; 6) Insomnia during the night; 7) Delayed insomnia; 8) Work and interests; 9) Retardation; 10) Somatic anxiety; 11) Hypochondriasis; 12) Psychiatric anxiety; 13) Genital symptoms; 14) Gastrointestinal somatic symptoms; 15) Agitation; 16 Suicide and 17) General somatic symptoms.

The total score was calculated by the summation of all 17 measurement variables.

Socio-economic status and medical record were assessed using a single item, uni-dimensional questions to obtain information on age, gender, marital status, occupation, income, energy drink, tea, coffee alcohol, sleeping pills and anti-depressant drugs.

Chapter III

Research Methodology

The study of "Depression and Quality of sleep in Burapha University, Thailand 2019" was approved by the Burapha University Ethics and Research Committee. Approved Ethics number 232/2562. The fund was supported by College of Pharmacy, Burapha University 2019.

A cross-sectional survey study was performed at Burapha University in 2020 at Chonburi, Thailand. Samples were randomly selected using non-probability sampling. A quota sampling method was employed to select a certain number (n=243) from three groups of people at Burapha University (n=81 for each group).

Population

All people at Burapha University in the year 2019 were in the population frame. The people at Burapha University were classified to 3 groups namely: 1. Lecturer, 2. Student and 3. Employee. Moreover, they were also divided into 21 faculties.

Sample

Since three statistical procedures were planned to use in this study. Those were:-

1. Analysis of Variance (ANOVA) will be used as a decision tool to assess the significance of means different of many aspects of the ratio dependent variables.
2. Chi Square will be used to find association of two non-metric variables.
3. Pearson's correlation will be used to judge a strength of linear relationship between two metric variables and also prediction equation is expected.

According to "Statistical Power Analysis for the Behavioral Sciences second edition 1977" [32] book wrote by Jacob Cohen, page 384 table 8.4.4 when α is set to 0.05, β 0.20, power 0.80, effect size 0.20 when k (group)= 3, it yielded sample size (n) = 81 in each group. Since there are 3 groups, therefore 81*3= 243 samples were purposive randomly selected.

Picture 01: Jacob Cohen table page 384

| | $u = 2$ | | | | | | | | | | |
| | f | | | | | | | | | | |
Power	.05	.10	.15	.20	.25	.30	.35	.40	.50	.60	.70	.80
.10	84	22	10	6	5	4	3	3	2	--	--	--
.50	662	166	74	42	27	19	15	11	8	6	5	4
.70	1028	258	115	65	42	29	22	17	11	8	6	5
.80	1286	322	144	81	52	36	27	21	14	10	8	6
.90	1682	421	188	106	68	48	35	27	18	13	10	8
.95	2060	515	230.	130	83	58	43	33	22	15	12	9
.99	2855	714	318	179	115	80	59	46	29	21	16	12

Sampling method:

Once population frame could be accessed, the probability sampling might yield more precision and a better representative of population. It was the strongest advantage of the survey research however probability sampling might consume time, money and more efforts therefore nonprobability sampling-quota sampling (a method for selecting survey participants that was a non-probabilistic version of stratified sampling) was employed in this study.

Instruments:

1. Demographic data were assessed using a single item, uni-dimensional questions to obtain information on age, gender, marital status, occupation, income, medical conditions, chronic disease(s), and usage of sleeping aids/sleeping pills, anti-depressant drugs or the other medicine(s), amount of caffeine drink and alcohol consumption were recorded.

2. Quality of sleep (insomnia) was measured by validated Pittsburgh sleep quality index (PSQI). PQSI was a self-rated questionnaire which assesses sleep quality and disturbances over a 1-month interval. The PSQI questionnaire consisted of 19 self-rated observed variables and 5 questions rated by the bed partner or roommate (if any). Only 19 self-rated measurement variables were included in the scoring and were combined to form a seven "component" score each of which has a range of 0-3 points. In all cases, a score of "0" indicated no difficulty, while a score "3" indicated severe difficulty. The seven component scores were then added to yield one "global" score, with a range of 0-21 points, "0" indicating no difficulty and "21" indicating severe difficulties in all areas. Higher scores indicated worse sleep quality.

The seven components were: 1) Subjective sleep quality 2) Sleep latency 3) Sleep duration 4) Habitual sleep efficiency 5) Sleep disturbances 6) Use of hypnotic agent and 7) Daytime dysfunction.

The Pittsburgh Sleep Quality Index (PSQI)

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

1. When have you usually gone to bed? _____(time)
2. How long (in minutes) has it taken you to fall asleep each night? _____(minutes)
3. When have you usually gotten up in the morning? _____(time)
4. How many hours of actual sleep do you get at night? (hours of sleep per night)_____
5. During the past month, how often have you

5a. Cannot get to sleep within 30 minutes
1. No 2. Less than once a week 3. Once or twice a week 4. Three or more time a week

5b. Wake up in the middle of the night or early morning
1. No 2. Less than once a week 3. Once or twice a week 4. Three or more time a week

5c. Have to get up to use the bathroom
1. No 2. Less than once a week 3. Once or twice a week 4. Three or more time a week

5d. Cannot breathe comfortably
1. No 2. Less than once a week   3. Once or twice a week   4. Three or more time a week

5e. Cough or snore loudly
1. No 2. Less than once a week   3. Once or twice a week   4. Three or more time a week

5f. Feel too cold
1. No 2. Less than once a week   3. Once or twice a week   4. Three or more time a week

5g. Feel too hot
1. No 2. Less than once a week   3. Once or twice a week   4. Three or more time a week

5h. Had bad dreams
1. No 2. Less than once a week   3. Once or twice a week   4. Three or more time a week

5i. Have pain
1. No 2. Less than once a week   3. Once or twice a week   4. Three or more time a week

5j. Other reason (s), please describe ……………………………..
How often you during the past month you had trouble sleeping because of this reason(s)?
1. No 2. Less than once a week   3. Once or twice a week   4. Three or more time a week

6. During the past month, how often have you taken medicine (prescribed or "over the counter") to help you sleep?
1. very good (0)   2. Fairly good (1)   3. Fairly bad (2)   4. Very bad (3)

7. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?
1. No 2. Less than once a week   3. Once or twice a week   4. Three or more time a week

8. During the past month, how much of a problem has it been for you to keep up enthusiasm to get things done?
1. No 2. Less than once a week   3. Once or twice a week   4. Three or more time a week

9. During the past month, how would you rate your sleep quality overall?
1. No   2. Only a very slight problem   3. Somewhat of a problem   4. A very big problem

10. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get thing done?
1. no bed partner or roommate   2. Partner/roommate in other room
3. partner in same room but not same bed   4. Partner in same bed
If you have a roommate or bed partner, ask him/her how often in the past month you had…
a)   Loud snoring
1. No   2. Less than once a week   3. Once or twice a week   4. Three or more time a week

b)   Long pauses between breaths while asleep
1. No   2. Less than once a week   3. Once or twice a week   4. Three or more time a week

c)   Legs twisting or jerking while you sleep
1. No   2. Less than once a week   3. Once or twice a week   4. Three or more time a week
d)   Episodes of disorientation or confusion during asleep; please describe ……………

1. No 2. Less than once a week   3. Once or twice a week   4. Three or more time a week

Scoring PSQI as followed:

Component 1: Subjective sleep quality-Question number 6 and assigned scores as followed:
Question number 6: During the past month, how often have you taken medicine (prescribed or "over the counter") to help you sleep?
1. very good (0)   2. Fairly good (1)   3. Fairly bad (2)   4. Very bad (3)

Table 01: Subjective sleep quality

Component 1 Subjective sleep quality	
Response to Question 6	Score
Very good	0
Fairly good	1
Fairly bad	2
Very bad	3

Component 1 score _____

Component 2: Sleep latency: Question number 2 and assigned scores as followed;
2.1) Question number 2: How long (in minutes) has it taken you to fall asleep each night? ____

Table 02: Sleep latency

Component 2 Sleep latency, question number 2	
Response to Question 2	Score
< or = 15 minutes	0
16-30 minutes	1
31-60 minutes	2
>60 minutes	3

2.2) Question number 5a, assigned score as followed:
Question 5a. During the past month, how often have you could not get to sleep within 30 minutes
1. No 2. Less than once a week   3. Once or twice a week   4. Three or more time a week

Table 03: Sleep latency

Component 2 Sleep latency, question number 5a	
Response to Question 5a	Score
Not during the past month	0
Less than once a week	1
Once or twice a week	2
Three or more time a week	3

2.3) Sum of question number 2 score and question number 5 score_____
2.4) Assigned component 2 as followed:

Table 04: Sleep latency

Component 2-Sleep latency	
Sum of Q2 and Q5a	score
0	0
1-2	1
3-4	2
5-6	3

Component 2 score _____

Component 3: Sleep duration-question number 4, and assigned score as followed
Question number 4: How many hours of actual sleep do you get at night? (hours of sleep per night)_____
Table 05: Sleep duration

Component 3-Sleep duration	
Response to question number 4	score
>7 hr	0
6-7 hr	1
5-6 hr	2
< 5 hr	3

Component 3 score: _____

Component 4: Habitual sleep efficacy
4.1) Write number of hours slept (question number 4) here _____
4.2) Calculate the number of hours spent in bed:
      Getting up time (question number 3) _____
      Bedtime (question number 1) _____
      Number of hours spent in bed _____
4.3) Calculate habitual sleep efficiency as followed:

$$\frac{\text{Number of hours slept} * 100}{\text{Number of hours spent in bed}} = \text{habitual sleep efficiency (\%)}$$

4.4) Assigned component 4 score as followed:
Table 06: Sleep efficiency

Component 4:Sleep efficiency	
Sleep efficiency	score
> 85%	0
75-84%	1
65-74%	2
< 65%	3

Component 4 scores ____

Component 5: Sleep disturbances
5.1) Table 07: Examine question number 5b-5j and assigned score for each question as followed:

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

Question number 5:
5 b. Wake up in the middle of the night or early morning
5 c. Have to get up to use the bathroom
5 d. Cannot breathe comfortably
5 e. Cough or snore loudly
5 f. Feel too cold
5 g. Feel too hot
5 h. Had bad dreams

5 i. Have pain

5 j. Other reason (s), please describe _____ how often?

5.2 Sum scores 5 a to 5 j _____

5.3 Table 08: Assigned component 5 score as followed:

Sum of 5 b to 5 j	score
0	0
1-9	1
10-18.9	2
1927	3

Component 5 score _____

Component 6: Use of sleeping medication: Use of sleeping medication

Examine question number 7 and assign score as followed:

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

1. No 2. Less than once a week   3. Once or twice a week   4. Three or more time a week

Table 09: Score

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

Component 6 score _____

Component 7: Daytime dysfunction:

7.1) Examine question number 8 and assign score as followed:

Question number 8: During the past month, how much of a problem has it been for you to keep up enthusiasm to get things done?

1. No 2. Less than once a week   3. Once or twice a week   4. Three or more time a week

Table 10: Score

Response	score
Never	0
Once or twice	1
Once or twice each week	2
Three or more time each week	3

Question number 8 score _____

7.2) Examine question number 9 and assign score as followed:

Question number 9: During the past month, how would you rate your sleep quality overall?

1. No   2. Only a very slight problem   3. Somewhat of a problem   4. A very big problem

Table 11: Score

Response	score
No problem at all	0
Only a very slight problem	1
Somewhat of a problem	2
Three or more time each week	3

Question number 9 score _____

7.3) Sum score of question number 8 and 9. _____

7.4) Table 12: assign component 7 score as followed:

Sum of question 8 and 9	Component 7 score
0	0
1-2	1
3-4	2
5-6	3

Component 7 score _____

Global PSQI Score:

Add the seven component scores together:

Global PSQI Score: _____

If the total score (0-21) was less than or equal to 5 refers to Good sleep quality and total score was more than 5 refers to Poor sleep quality.

3. Hamilton Depression Rating Scale (HAM-D) was developed by Matthew Chow was used to measured depression symptom. HAM-D was generally used to screen for the presence of symptoms of depression and anxiety (psychological depress). This scale consisted of 17 observed variables namely: 1) Insight; 2) Depressed mood; 3) Initial insomnia; 4) Feelings of guilt; 5) Weight loss; 6) Insomnia during the night; 7) Delayed insomnia; 8) Work interests; 9) Retardation; 10) Somatic anxiety; 11) Hypochondriasis; 12) Psychiatric anxiety; 13) Genital symptoms; 14) Gastrointestinal somatic symptoms; 15) Agitation; 16 Suicide and 17) General somatic symptoms. The total summated score of all 17 questions was range from 0-53. The severity of depression were categorized as followed.

1.   Scores below 7 generally represent the absence or remission of depression.
2.   Scores between 7-17 represent mild depression.
3.   Scores between 18-24 represent moderate depression.
4.   Scores 25 and above represent severe depression.

Depression concept was a major predictor of quality of sleep (insomnia) of the people at Burapha University. Poor quality of sleep was defined as scores greater than 5, and good quality of sleep was defined as scores of 5 and below. Two statistical procedure-Chi Square and Pearson's correlation were used to triangulate the association and correlation of these 2 major concepts.

The information obtained from 1. Socio-economic status and demographic data, 2. PSQI and 2. HAM-D questionnaire were analyzed by Statistical Package for Social Sciences (SPSS) Version 17.

Descriptive statistics:

Nonmetric variables were demonstrated by frequency, percent and cross-tabulations whereas metric variables were presented by mean ± SD.

Inference statistics:

1.   Analysis of variance was used to assess all difference between means of metric variables.

2. Chi Square was used to test association between nonmetric variables-quality of sleep (based on global PSQI scores) and nonmetric variable-depression status.

3. Pearson's correlation was used to confirm the linear relationship between depression and quality of sleep. Alpha (α) was set to 0.05.

Scale Validity:

Face and Content validity were evaluated by three social sciences experts from Faculty of Pharmaceutical Sciences, Chulalongkorn University. All three experts evaluated items in the questionnaire using a four-point Likert scale, whereas 1=not relevant, 2= somewhat relevant, 3=quite relevant, 4=highly relevant. Then, a content validity index (CVI) was computed for each item. The CVI $\geq$ 0.8 was passed-a good content validity [appendix].

Scale Reliability:

Cronbach's Alpha was used to calculated internal consistency (reliability) of the scales. A Cronbach's Alpha >0.7 (would yield R^2>.50 that meant the scale could explained more than 50% of true score) was considered an acceptable level.

Pilot test:

A face to face interviewed was performed to 15 samples (5 people from each group). It worked as a pilot study. It was done to confirm the appropriateness of the items and the suitability of written language and response options. After pilot study, fine tuning of the final version of questionnaire was amended.

All data has been reported in the aggregate. To avoid inadvertent identification of an individual. 4 hypotheses were generated from the conceptual model of this study.

Hypotheses:

1. Analysis of variance was used to compare means of insomnia, depression, BMI, tea and caffeine consumption, alcohol consumption, energy drink of the three groups (lecturer, student and employee).

   Ho 1: $\mu_{lecturer} = \mu_{student} = \mu_{employee}$

2. Analysis of variance was used to compare means of insomnia, depression, BMI, tea and caffeine consumption, alcohol consumption, energy drink of gender (male and female).

   Ho 2: $\mu_{male} = \mu_{female}$

3. Pearson's Chi Square was used to identify association between quality of sleep and depression (when data were collected in category scale).

   Association $_{depression\ sleep\ quality} = 0$

4. Pearson's correlation will be used to identify linear relationship between sleep quality and depression.

   Rho $_{depression\ sleep\ quality} = 0$

Table 13: Operationalization of measurement variables

Variables	Definition of variables	Attributes
BMI	Body mass index	Ratio scale, Score 18-50
Gender	Gender	Nominal scale, 1 Male, 0 Female
AGE	Age (years)	Ratio scale, 0-100
PQSI (Insomnia)	Sleeping quality measure by Pittsburgh sleep quality index	Ratio scale, 0-210, 7 constructs, 19 observed variables
Depression (HAM-D)	The Hamilton Depression Rating Scale (HAM-D)	Ratio scale, 14 observed variables
Tea	How many cups of tea do you drink per day?	0-10
Coffee	How many cups of coffee do you drink per day?	0-10
Energy drink	How many cups of coffee do you drink per day?	0-10
Alcohol	How many cups of alcohol do you drink per week?	0-20

Chapter IV

This chapter reported the outcomes of research on Depression and Quality of sleep in Burapha University, Thailand 2019. The results of the descriptive statistical analyses by which the study's response data were interpreted; and the resultant evaluative statistical analyses, on which its hypotheses were tested.

Questionnaire Response:

As a result of collecting data by face to face interview via questionnaire, all 243 (100%) samples were completely collected on February 28, 2020.

Scale Validity: Content Validity Index Calculation

Pittsburgh sleep quality index (PSQI)

$$\text{S-CVI} = \frac{\Sigma I - CVI}{total\ questions}$$

All three experts rated a score = 3 to each item.

$$\text{I-CVI} = \frac{The\ number\ of\ experts\ rated\ 3\ or\ 4}{Total\ experts}$$

$$= \frac{3}{3} = 1$$

The PQSI scale consisted of 19 items. : $\Sigma\text{I-CVI} = 19*1 = 19$

$$\text{S-CVI} = \frac{19}{19} = 1$$

$$\text{S-CVI} > 0.80$$

Therefore, Pittsburgh sleep quality index's <u>CONTENT VALIDITY PASSED</u>.

Hamilton Depression Rating Scale (HAM-D)

$$\text{S-CVI} = \frac{\Sigma I - CVI}{total\ questions}$$

All three experts rated a score = 3 to each item.

$$\text{I-CVI} = \frac{The\ number\ of\ experts\ rated\ 3\ or\ 4}{Total\ experts}$$

$$= \frac{3}{3} = 1$$

Hamilton Depression Rating Scale consisted of 17 items: $\Sigma\text{I-CVI} = 17*1 = 17$

$$\text{S-CVI} = \frac{17}{17} = 1$$

$$\text{S-CVI} > 0.8$$

Therefore, Hamilton Depression Rating Scale's <u>CONTENT VALIDITY PASSED</u>.

Scale Reliability:

Internal consistency of Pittsburgh sleep quality index (PSQI) and Hamilton Depression Rating Scale (HAM-D) were assessed by Cronbach's Alpha coefficient. The reliability coefficients of PSQI was 0.74 and HAM-D was 0.78 as shown in Table 14

Table 14: Scale Reliability

	Mean	SD	Min	Max	Cronbach alpha
PSQI	6.42	1.24	1	19	0.74
HAM-D	8.74	2.41	0	17	0.78

Descriptive data:

As of 243 respondents, 47 (58.02%) were female lecturers, 34 (41.98%) were male lecturers. 45 (55.56%) were female students, 36 (44.44%) were male students. 50 (61.73%) were female employee, 31 (38.27%) were male employees. Chi Square between gender and occupation was not significant at p=0.064. Gender and occupation were not associated.

Table 15: Gender * Occupation cross-tabulation

		Gender		Total
		Female	Male	
Occupation	Lecturer	47	34	81
	Student	45	36	81
	Employee	50	31	81
Total		142	101	243

Picture 02: Gender and Occupation
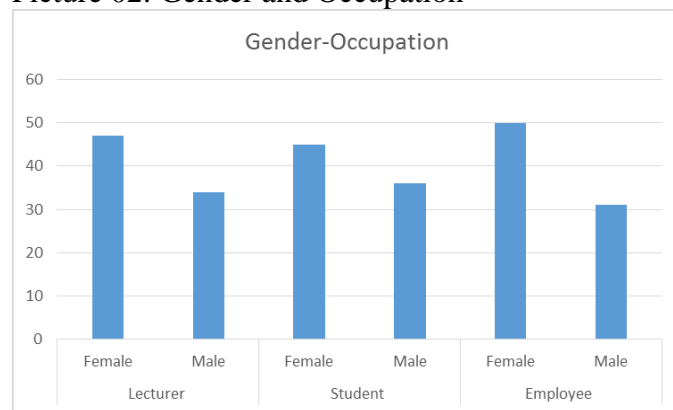
Table 16: Chi Square of gender and occupation

	Value	df	p-value
Pearson Chi-Square	15.447[a]	2	.064
N of Valid Cases	243		
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 29.64.			

Conclusion: Sampling quality was good as shown in table 15 and picture 02

One way ANOVA was used to compare means of age, BMI, teas, coffee and energy drinking between lectures, student and employee. The results were as follow.

The means of Age of lecturer, employee and student were 42.47>33.86>20.42 years. It was significantly different at p=0.000**
The means of BMI of lecturer, employee and student were 25.92>23.74 >22.22 kilogram per meter^2. It was significantly different at p=0.038*
The means of Tea drinks of employee, student and lecturer were 11.94>9.19>6.84 cups per week. It was significantly different at p=0.047*
The means of Coffee drinks of lecturer, employee and student were 10.42>8.38>4.15 cups per week. It was significantly different at p=0.044*
The means of Energy drinks of employee, student and lecturer were 6.14>4.16>0 bottles per week. It was not significantly different at p=0.023*. As shown in table 17.

Table 17: ANOVA of ratio variables between lecturer, student and employee

Variables	Type	Mean	SD	p-value
Age	Lecturer	42.47	5.68	0.000**
	Student	20.42	1.53	
	Employee	33.86	7.99	
BMI	Lecturer	25.9	2.47	0.038*
	Student	22.22	4.1	
	Employee	23.74	3.36	
Tea	Lecturer	6.84	2.98	0.047*
	Student	9.19	0.74	
	Employee	11.93	3.67	
Coffee	Lecturer	10.42	0.85	0.044*
	Student	4.15	0.53	
	Employee	8.38	0.56	
Energy drink	Lecturer	0	0	0.023*
	Student	4.16	4.16	
	Employee	6.14	6.14	

Picture 3: Compare means of ratio variables between lecturer, student and employee
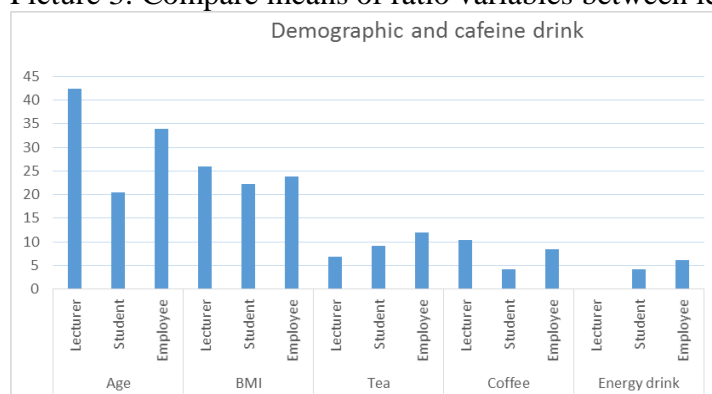
Conclusions: Lecturer was older and fatter than employee and student. Employee drank tea and energy drink more than student and lecturer. However, lecturer drank coffee more than employee and student.

Objective 1: To compare quality of sleep (insomnia) and depression between lecturers, student and employees at Burapha University.

ANOVA was used to compare means of sleep quality between lecturer, student and employees. The results were as follow.

The means of sleep latency in minutes of student, employee and lecturer were 27.04>19.80>19.40 minutes. It was significantly different at p=0.042*

The means of sleeping hour of employee, lecturer and student were 10.23>6.56>6.14 per night. It was significantly different at p=0.036*

The means of habitual sleep efficiency of lecturer, employee and student were 95.30>95.06>93.17 % It was not significantly different at p=0.064.

The means of sleep disturbance of employee, lecturer and student were 9.14>7.81>7.73. It was not significantly different at p=0.078.
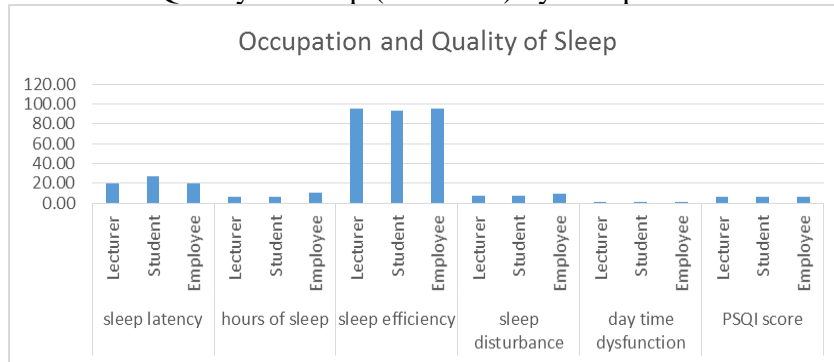
The means of day time dysfunction of student, lecturer and employer were 1.40>1.03>0.90. It was not significantly different at p=0.082.

The means of global PQSI score of student, lecturer and employer were 6.78>6.75>6.50. It was not significantly different at p=0.121.

Table 18: ANOVA of Quality of Sleep between lecturer, student and employee

Variables	Occupation	mean	SD.	P-value
Sleep latency (minutes)	Lecturer	19.40	4.98	0.042*
	Student	27.04	5.21	
	Employee	19.80	6.44	
Hour of sleep per night (Question 4)	Lecturer	6.56	0.84	0.036*
	Student	6.14	1.30	
	Employee	10.23	2.45	
Habitual sleep efficiency %	Lecturer	95.30	3.64	0.064
	Student	93.17	3.64	
	Employee	95.06	2.44	
Sleep disturbance	Lecturer	7.81	3.85	0.078
	Student	7.73	2.66	
	Employee	9.14	4.65	
Day time dysfunction	Lecturer	1.03	0.67	0.082
	Student	1.40	0.96	
	Employee	0.90	0.55	
Global PQSI Score	Lecturer	6.78	1.45	0.124
	Student	6.74	1.71	
	Employee	6.50	1.47	

Picture 04: Quality of Sleep (Insomnia) by occupation

Conclusions: Student stayed awake in the bed before sleeping longer than employee and lecturer. Employer slept longer than lecturer and student, however lecturer and student sleeping hours were not significantly different (Tukey, p-value=0.128). The percentage of habitual sleep efficiency of lecturer, student and employee were not significantly different. Sleep disturbance of lecture, student and employee were not significantly different. Day time dysfunction of lecturer, student and employee were not significantly different. The means of global PQSI score of student, lecturer and employer were not significantly different. It meant that the quality of sleep of lecturer, student and employee at Burapha University were not significantly different.

Objective 2: To compare quality of sleep (insomnia) and depression between female and male at Burapha University.

ANOVA was used to compare means of sleep quality between female and male. The results were as follow.

The means of sleep latency in minutes between female and male were 22.24>20.01 minutes. It was significantly different at p=0.028*

The means of sleeping hour between female and male were 6.34<9.17. It was significantly different at p=0.044*

The means of habitual sleep efficiency between female and male were 90.33<92.47. % It was significantly different at p=0.036*.

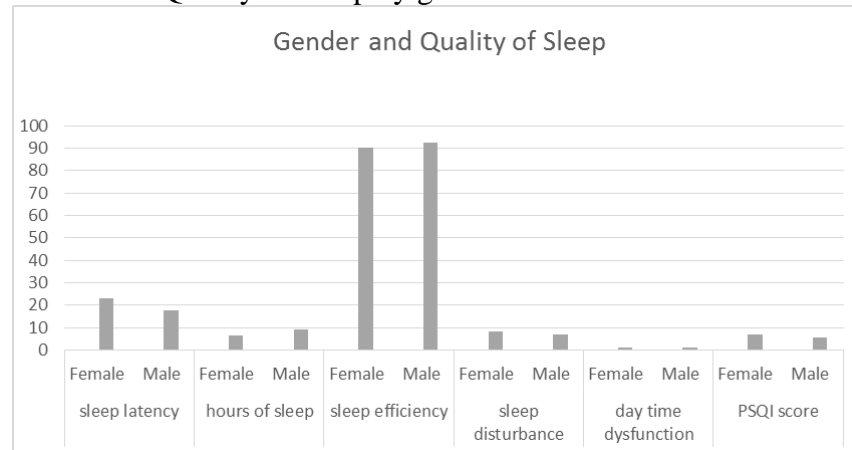The means of sleep disturbance between female and male were 8.33>7.14. It was not significantly different at p=0.074.

The means of day time dysfunction between female and male were 1.27>1.06. It was not significantly different at p=0.083.

The means of global PQSI score between female and male were 6.72>5.74. It was significantly different at p=0.046*.

Table 19: ANOVA of Quality of Sleep between female and male

Variables	Gender	Mean	SD.	P-value
Sleep latency (minutes)	Female	24.24	3.66	0.028*
	Male	20.01	3.12	
Hour of sleep per night (Question 4)	Female	6.34	1.21	0.044*
	Male	9.17	2.26	
Habitual sleep efficiency %	Female	90.33	2.58	0.036*
	Male	92.47	3.94	
Sleep disturbance	Female	8.33	3.35	0.074
	Male	7.14	2.24	
Day time dysfunction	Female	1.27	2.81	0.083
	Male	1.06	1.82	
Quality of Sleep (Insomnia)	Female	6.47	3.80	0.047*
	Male	6.14	3.90	

Picture 05: Quality of Sleep by gender

Conclusions: Female stayed awake in the bed before sleeping longer than male. Male slept longer hours than female. The percentage of habitual sleep efficiency of male was higher than female. Sleep disturbance between male and female were not significantly different. Day time dysfunction of male and female were not significantly different. The means of global PQSI score of female was higher than male. It meant the quality of sleep of male is better than female.

Objective 1: To compare quality of sleep (insomnia) and depression between lecturers, student and employees at Burapha University.

ANOVA was used to compare means of insomnia and depression between lecturer, student, and employee. The results were as follow.

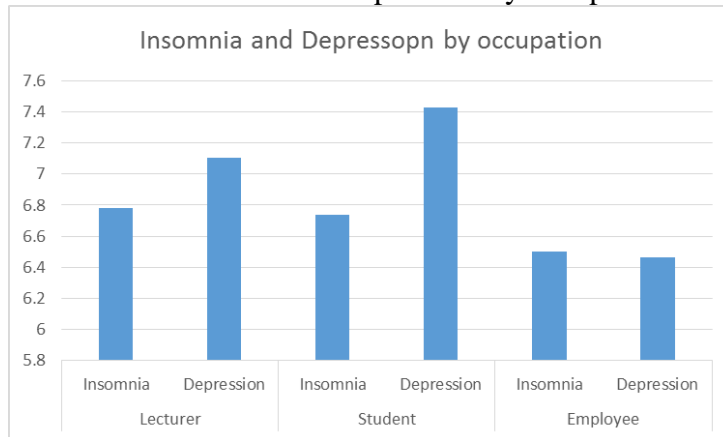The means of insomnia of lecturer, student and employee were 6.78>6.74>6.50. It was not significantly different at p=0.124

The means of depression of student, lecturer and employee were 7.43>7.10>6.46. It was not significantly different at p=0.174

Table 20: ANOVA of insomnia and depression between lecturer, student and employee

		mean	SD	p-value
Insomnia	Lecturer	6.78	1.45	0.124
	Student	6.74	1.71	
	Employee	6.50	1.47	
Depression	Lecturer	7.10	1.07	0.174
	Student	7.43	1.94	
	Employee	6.46	1.85	

Picture 06: Insomnia and Depression by occupation

Conclusions: Insomnia and depress between lecturer, student and employee were not significantly different.

Objective 2: To compare quality of sleep (insomnia) and depression between female and male at Burapha University.

ANOVA was used to compare means of insomnia and depression between female and male. The results were as follow.

The means of insomnia of female and male were 6.47>6.14. It was significantly different at p=0.047*

The means of depression of female and male were 7.71>6.12. It was significantly different at p=0.023*

Table 21: ANOVA of insomnia and depression between male and female

		mean	SD	p-value
Insomnia	Female	6.47	3.80	0.047*
	Male	6.14	3.90	
Depression	Female	7.71	3.42	0.023*
	Male	6.12	3.35	

Picture 07: Insomnia an Depression by gender
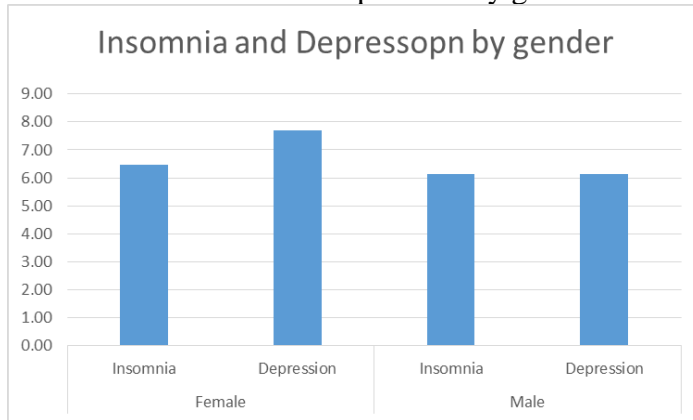
Conclusions: Female got insomnia and depress more than male.

Objective 3: To investigate relationship between depression and quality of sleep.

Table 22: Cross-tabulation between depression and quality of sleep.

		Depression		Total
		Normal	Moderate	
Quality of Sleep	Sleep well	71	32	103
	Insomnia	47	92	140
	Total	118	124	243

Table 23: Association between depression and quality of sleep.

	Value	df	p-value
Pearson Chi-Square	22.406[a]	4	0.014*
N	243		
a. 4 cells (40.0%) have expected count less than 5. The minimum expected count is 1.64.			

Pearson Chi Square confirmed a significant association between depression and quality of sleep (insomnia) P=0.014*

Triangulation with Pearson product moment correlations

Table 24: Pearson's Correlations

	Depression	Quality of sleep
Pearson Correlation	1	+0.536*
P-value		.024*
N		243

*. Correlation is significant at the 0.05 level (2-tailed).

Pearson Correlation confirmed a significant positive linear relationship between depression and quality of sleep (insomnia) P=0.024*, r=+0.536, R^2=0.287

Conclusion: Pearson Chi Square confirmed a significant association between depression and quality of sleep (insomnia) P=0.014* when triangulated with Pearson's Correlation (more power statistics) Pearson Correlation confirmed a significant positive linear relationship between depression and quality of sleep (insomnia) P=0.024*, r=+0.536, R^2=0.287. The more depress the more insomnia.
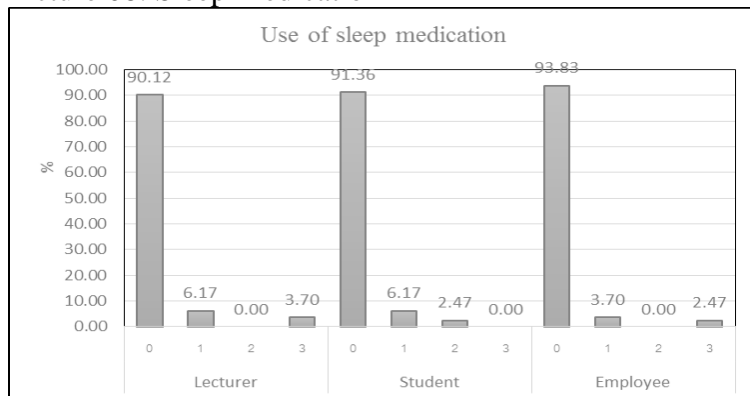
Objective 4: To explore drugs prescribe for quality of sleep (insomnia) and depression at Burapha University.

From PQSI question number 6, frequency and percent of using sleeping medication could be allocated in table 25.

Table 25: Sleep Medication

Group	Use of sleep medication			
	score	Response to Q6	Frequency	Percent
Lecturer	0	Not during past month	73	90.12
	1	Less than once a week	5	6.17
	2	Once or twice a week	0	0.00
	3	Three or more times a week	3	3.70
Student	0	Not during past month	74	91.36
	1	Less than once a week	5	6.17
	2	Once or twice a week	2	2.47
	3	Three or more times a week	0	0.00
Employee	0	Not during past month	76	93.83
	1	Less than once a week	3	3.70
	2	Once or twice a week	0	0.00
	3	Three or more times a week	2	2.47

Picture 08: Sleep Medication

0=Not during past month
1=Less than once a week
2=Once or twice a week
3=three or more time a week

Objective 4: To explore drugs prescribe for quality of sleep (insomnia) and depression at Burapha University.

Table 26: Sleeping medication prescribed by physicians

Drugs help sleeping	Frequency	Percent
Lorazepam 0.5 mg.	11	4.53
Lorazepam 1.0 mg.	5	2.06
Clonazepam 0.5 mg	4	1.65

Picture 09: Sleeping drugs
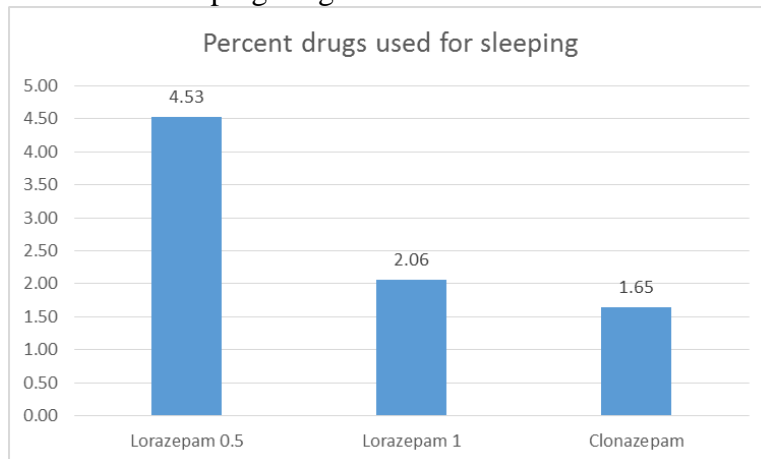
Table 27: Depression medication prescribed by physicians

Drugs for depression	Frequency	Percent
Amitriptyline	12	4.94
Fluoxetine	9	3.70
Clonazepam	6	2.47

Picture 10: Depression Medication
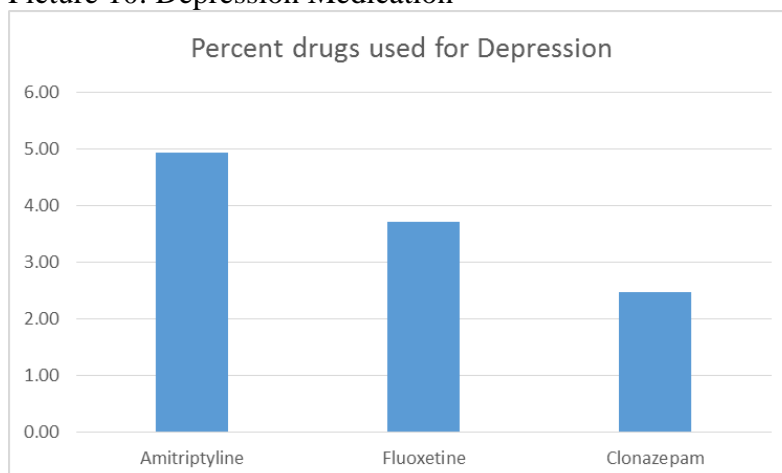
From table 17-27, we already did answer all research questions and did meet the objectives of this study. The followings were the extra findings we wanted to elaborate it in details.

Table 28: Subjective Sleep quality question no.
9 During the past month, how would you rate your sleep quality overall?
1. No   2. Only a very slight problem   3. Somewhat of a problem   4. A very big problem

Group	Subjective sleep quality			
	score	Question 9	Frequency	Percent
Lecturer	0	Very good	6	7.41
	1	Fairly good	57	70.37
	2	Fairly bad	17	20.99
	3	Very bad	1	1.23
Student	0	Very good	4	4.94
	1	Fairly good	40	49.38
	2	Fairly bad	32	39.51
	3	Very bad	5	6.17
Employee	0	Very good	11	13.33
	1	Fairly good	51	63.33
	2	Fairly bad	19	23.33
	3	Very bad	0	0.00

Picture 11: Subjective sleep quality
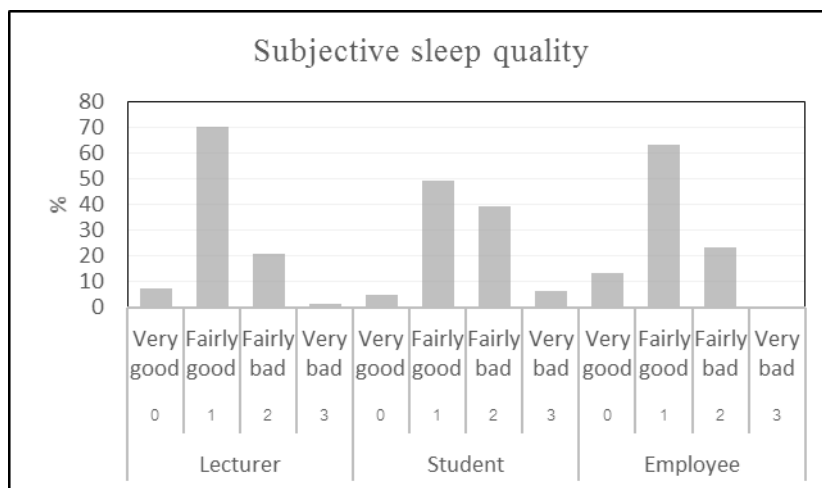
Component 2: Sleep latency:
Question 2: During the past month, how long (in minutes) has it usually take you to fall asleep each night? And
Question 5a: During the past month, how often have you had trouble sleeping because you cannot get to sleep within 30 minutes?

Table 29: Percentage of sleep latency in each group
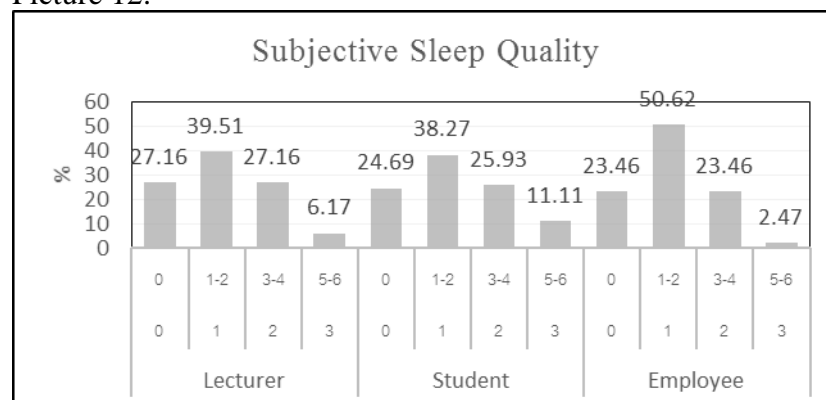
Group	Sleep latency			
	score	Score summation of Q2 and Q5a	Frequency	Percent
Lecturer	0	0	22	27.16
	1	1-2	32	39.51
	2	3-4	22	27.16
	3	5-6	5	6.17
Student	0	0	20	24.69
	1	1-2	31	38.27
	2	3-4	21	25.93
	3	5-6	9	11.11
Employee	0	0	19	23.46
	1	1-2	41	50.62
	2	3-4	19	23.46
	3	5-6	2	2.47

Picture 12:

Sleep latency—Score summation of component 2 was the sum of questions 2 and 5a. The question 2 was categorized into 4 scores; < 15 minutes =0, 16-30 minutes=1, 31-60 minutes=2, > 60 minutes=3.

While the question 5a was categorized into 4 scores; 0=not during past month, 1=less than once a week, 2=once or twice a week and 3=three or more times a week.

Component 3: Sleep duration—question 4: During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spend in bed.) Hours of sleep per night?

Table 30: Sleep duration

Group	Sleep duration			
	score	Question 4	Frequency	Percent
Lecturer	0	>7 hours	14	17.28
	1	6-7 hours	62	76.54
	2	5-6 hours	5	6.17
	3	< 5 hours	0	0.00
Student	0	>7 hours	8	9.88
	1	6-7 hours	48	59.26
	2	5-6 hours	20	24.69
	3	< 5 hours	5	6.17
Employee	0	>7 hours	22	27.16
	1	6-7 hours	40	49.38
	2	5-6 hours	16	19.75
	3	< 5 hours	3	3.70

Picture 12:
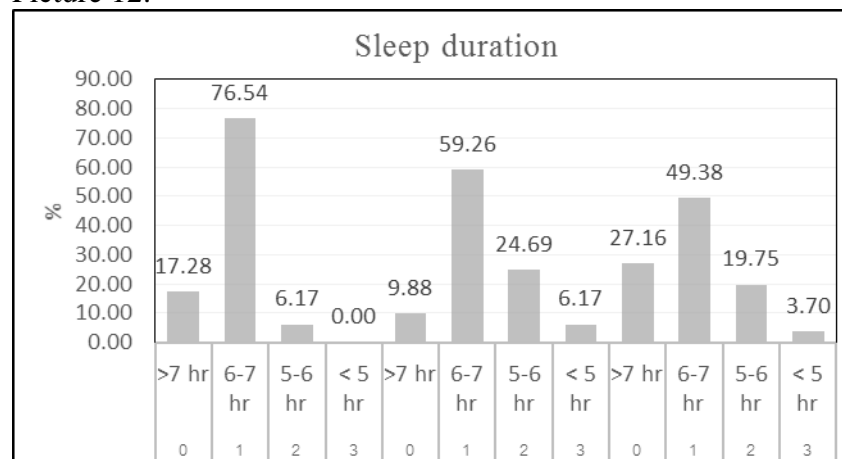
Sleep duration: 0=> 7 hr, 1=6-7 hr, 2=5-6 hr, 3=< 5 hr .

Component 4: Sleep efficiency: questions 1, 3, and 4
Question 1: During the past month, when have you usually gone to bed at night?
Usual bed time.....
Question 3: During the past month, when have you usually gotten up in the morning?
Usual getting up time.....
Question 4: During the past month, how many hours of actual sleep did you get at night?
(This may be different from the number of hours you spend in bed.)
Hours of sleep per night....

Table 31: Sleep efficiency

Group	Sleep efficiency			
	Score	Sleep efficiency	Frequency	Percent
Lecturer	0	> 85%	81	100.00
	1	75-84%	0	0.00
	2	65-74%	0	0.00
	3	< 65%	0	0.00
Student	0	> 85%	73	90.12
	1	75-84%	5	6.17
	2	65-74%	0	0.00
	3	< 65%	3	3.70
Employee	0	> 85%	78	96.30
	1	75-84%	3	3.70
	2	65-74%	0	0.00
	3	< 65%	0	0.00

Picture 13:
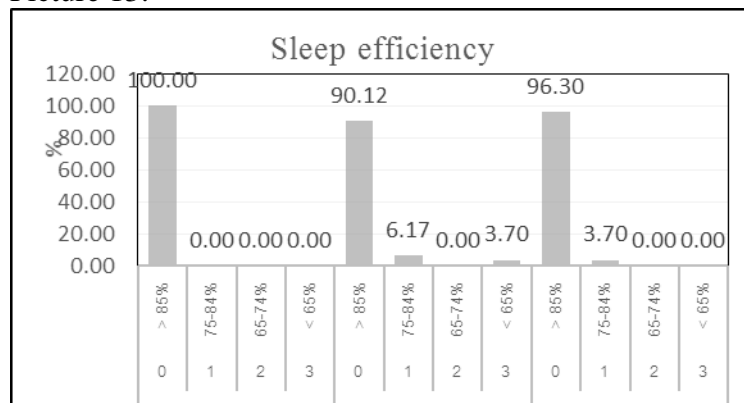
Sleep efficiency (%) = (hours slept / hours in bed) * 100
hours slept—question 4   #
hours in bed—calculated from responses to questions 1 and 3

Sleep efficiency: 0= > 85%, 1= 75-84%, 2= 65-74%, 3= < 65%

Component 5: Sleep disturbance—questions 5b-5j

5. During the past month, how often have you Not during Less than Once or Three or had trouble sleeping because you …

a. Cannot get to sleep within 30 minutes

b. Wake up in the middle of the night or early morning

c. Have to get up to use the bathroom

d. Cannot breathe comfortably

e. Cough or snore loudly

f. Feel too cold

g. Feel too hot

h. Have bad dreams

i. Have pain

j. Other reason (s), please describe, including how often you have had trouble sleeping because of this reason (s):

Table 32: Percentage of sleep disturbance in each group

Group	Sleep disturbance			
	Score	Sum of questions 5b to 5j	Frequency	Percent
Lecturer	0	0	2	2.47
	1	1-9	47	58.02
	2	10-18	28	34.57
	3	19-27	4	4.94
Student	0	0	0	0.00
	1	1-9	53	65.43
	2	10-18	25	30.86
	3	19-27	3	3.70
Employee	0	0	4	4.94
	1	1-9	36	44.44
	2	10-18	36	44.44
	3	19-27	5	6.17

Picture 14: Sleep disturbance
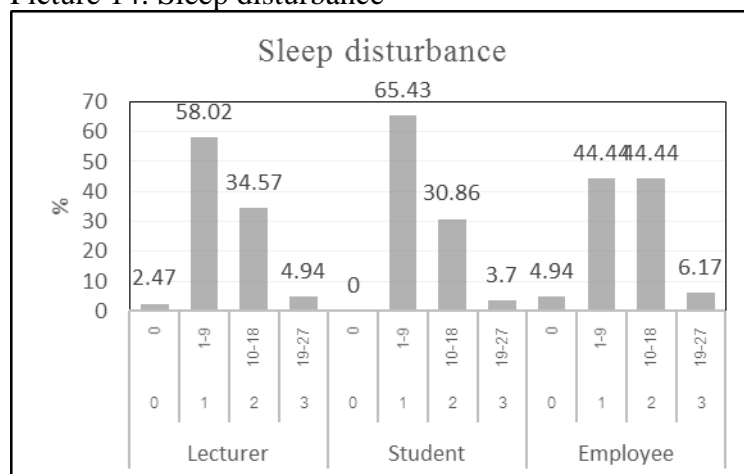
Each question from PQSI question 5b to question 5j were scored by: 0 = not during past month, 1 = less than once a week, 2 = once or twice a week and 3 = three or more times a week.

Sleep disturbance: 0 = sum of 5b to 5j = 0, 1 = sum of 5b to 5j = 1-9, 2 = sum of 5b to 5j = 10-18 and 3 = sum of 5b to 5j = 19-27.

Component 6: Use of sleep medication: question 6

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

From PQSI question number 6, frequency and percent of using sleeping medication could be allocated in table 33.

Table 33: Use of sleeping drug

| Group | Use of sleep medication | | | |
	score	Response to Q6	Frequency	Percent
Lecturer	0	Not during past month	73	90.12
	1	Less than once a week	5	6.17
	2	Once or twice a week	0	0.00
	3	Three or more times a week	3	3.70
Student	0	Not during past month	74	91.36
	1	Less than once a week	5	6.17
	2	Once or twice a week	2	2.47
	3	Three or more times a week	0	0.00
Employee	0	Not during past month	76	93.83
	1	Less than once a week	3	3.70
	2	Once or twice a week	0	0.00
	3	Three or more times a week	2	2.47

Picture 15: Use of sleep medication
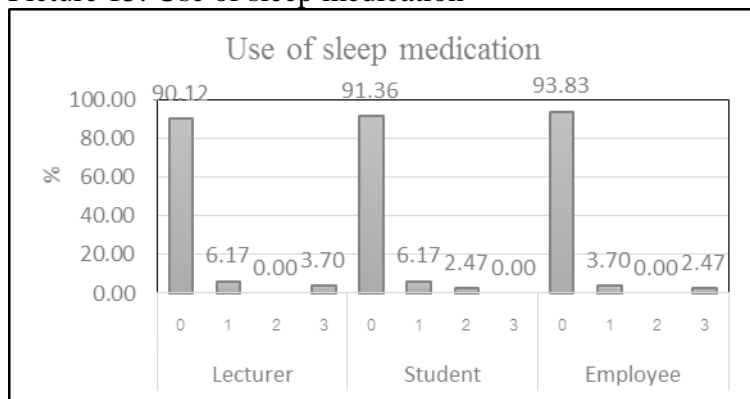
Question 9: During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?
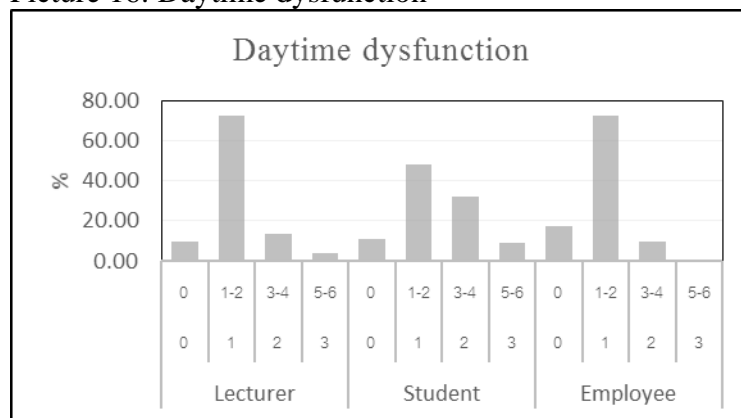Component 7: Daytime dysfunction: questions 7 and 8
Question 7: During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?
Question 8: During the past month, how much of a problem has it been for you to keep up enthusiasm to get things done?

Table 34: Daytime dysfunction

Group	Daytime dysfunction			
	Score	Sum Q7 and Q8	Frequency	Percent
Lecturer	0	0	8	9.88
	1	1-2	59	72.84
	2	3-4	11	13.58
	3	5-6	3	3.70
Student	0	0	9	11.11
	1	1-2	39	48.15
	2	3-4	26	32.10
	3	5-6	7	8.64
Employee	0	0	14	17.28
	1	1-2	59	72.84
	2	3-4	8	9.88
	3	5-6	0	0.00

Picture 16: Daytime dysfunction

Daytime dysfunction:
Question 7: 0 = not during past month, 1 = less than once a week, 2 = once or twice a week and 3 = three or more times a week.
Question 8: 0 = not during past month, 1 = less than once a week, 2 = once or twice a week and 3 = three or more times a week.
Daytime dysfunction: 0 = not during past month, 1 = less than once a week, 2 = once or twice a week and 3 = three or more times a week.

In The Chapter V, The answered to meet the objectives, conclusions, limitation of this study and future research would be explained

Chapter V

This research study "Depression and Quality of sleep in Burapha University, Thailand 2019" the researcher used two scales to measure two concepts-Depression by Hamilton Depression Rating Scale (HAM-D) and Quality of sleep (Insomnia) by Pittsburgh sleep quality index (PSQI) to investigate relationship between Depression and Insomnia. We have found it. The finding in Chapter IV were summarized in this chapter.

Validity and Reliability: The PSQI has internal consistency and a reliability coefficient (Cronbach's alpha) of 0.83 for its seven components. Numerous studies using the PSQI in a variety of older adult populations internationally have supported high validity and reliability. In this study, Cronbach's alpha was 0.74 (>0.70 passed).

Referred to the objectives of this study were:

1. To compare quality of sleep (insomnia) and depression between lecturers, student and employees at Burapha University.
2. To compare quality of sleep (insomnia) and depression between female and male at Burapha University.
3. To investigate relationship between depression and quality of sleep.
4. To explore drugs prescribe for quality of sleep (insomnia) and depression at Burapha University.

Objective 1: To compare quality of sleep (insomnia) and depression between lecturers, student and employees at Burapha University.

The answers were: The Quality of sleep (Insomnia) between lecturer, student and employee were: Employee, student and lecturer scores were 6.50<6.74<6.78. Employee slept better than student and student slept better than lecturer however, it was not a significantly different (p=0.124, ANOVA). All three study groups had PQSI scores bigger than 5, this meant all average three groups were in mild insomnia status, in other words they had low Quality of Sleep.

Depression score (HAM-D) of Student, lecturer and employee were 7.43>7.10>6.46. Student group was most depressed than lecturer group and lecturer group was more depressed than employee group. However, this was not significantly different (p=is meant 0.174, ANOVA). Student and lecturer group scores were bigger than 7, this meant they were in mild depression status but employee group score was 6.46, it meant employee group was not depress.

Objective 2: To compare quality of sleep (insomnia) and depression between female and male at Burapha University.

The answers were: The Quality of sleep (Insomnia) between male and female were: 6.14<6.67. Male slept significantly better than female (p=0.047*, ANOVA).

This findings advocated many scholars who did this before such as HoL Loway, K.L (2016), Delphin-Combe, F. (2016), Yu, J. et al (2016), Kang, H.J.12 (2016), Van Dijk, S.D.M (2016).

However both groups had PQSI scores bigger than 5, this meant they were in mild insomnia status, in other words low Quality of Sleep.

Depression score (HAM-D) between male and female were: 6.12<7.71. Men were significantly less depress than female (p=0.023*, ANOVA). Female HAM-D score was bigger than 7, it meant female group was in depress status. This finding advocated many scholars who did this before such as Elizabeth C. Mason and Allison G. Harvey (2014), Shou Pan et al, (2017).

Objective 3: To investigate relationship between depression and quality of sleep
The answers were: The significant positive relationship between Depression and Insomnia was definitely confirmed (r $_{Depression\ Insomnia}$ =+0.536, R^2=0.287, P=0.024*, Pearson's Correlation, p=0.014*, Chi Square) This findings advocated many scholars who did this before Daniel J.et al (2018), Manote Lotrakul et al (2007), Fadia Isaac et al (2011).

Objective 4: To explore drugs prescribe for quality of sleep (insomnia) and depression at Burapha University.

Limitations of this study:

1. Due to the limitation of time and resources, nonprobability-Quota sampling method was exercised to collect data although population frame was clear and could be accessed. Probability sampling might yield more reliable representatives of Burapha University people.
2. The PSQI is a subjective measure of sleep. Self-reporting by clients though empowering, may can reflect inaccurate information if the client has difficulty understanding what is written, or cannot see or physically write out responses.

Future research:

This topic "Depression and Insomnia" should be repeated done in more elderly groups in each province in Thailand. It is necessary and interesting to examine drugs used in insomnia and depress in the elderly.

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APPENDIX

Content validity of sleep quality

Sleep Quality	Expert 1	Expert 2	Expert 3	I-CVI
When have you usually gone to bed?	/	/	/	**1.00**
How long (in minutes) has it taken you to fall asleep each night?	/	/	/	1.00
When have you usually gotten up in the morning?	/	/	/	1.00
How many hours of actual sleep do you get at night? (This may be different than the number of hours you spend in bed)	/	/	/	1.00
During the past month, how often have you had trouble sleeping because you cannot get to sleep within 30 minutes	/	/	/	1.00
During the past month, how often have you had trouble sleeping because you wake up in the middle of the night or early morning	/	/	/	1.00
During the past month, how often have you had trouble sleeping because you have to get up to use the bathroom	/	/	/	1.00
During the past month, how often have you had trouble sleeping because you cannot breathe comfortably	/	/	/	1.00
During the past month, how often have you had trouble sleeping because you cough or snore loudly	/	/	/	1.00
During the past month, how often have you had trouble sleeping because you feel too cold	/	/	/	1.00
During the past month, how often have you had trouble sleeping because you feel too hot	/	/	/	1.00
Have bad dreams	/	/	/	1.00
Have pain	/	/	/	1.00
Other reason(s), please describe, including how often you have had trouble sleeping because of this reason(s)	/	/	/	1.00
During the past month, how often have you taken medicine (prescribed or "over the counter") to help you sleep?	/	/	/	1.00
During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?	/	/	/	1.00
During the past month, how much of a problem has it been for you to keep up enthusiasm to get things done?	/	/	/	1.00
During the past month, how would you rate your sleep quality overall?	/	/	/	1.00
Do you have a bed partner or roommate?	/	/	/	1.00
Loud snoring	/	/	/	1.00
Long pauses between breaths while asleep	/	/	/	1.00
Legs twitching or jerking while you sleep	/	/	/	1.00
Episodes of disorientation or confusion during sleep ?	/	/	/	1.00
Other restlessness while you sleep; please describe……………………………..	/	/	/	1.00

Content validity of depression

Depression	Expert1	Expert2	Expert3	I-CVI
Depressed Mood (sadness, hopeless, helpless, worthless)	/	/	/	1.00
Feelings of guilt	/	/	/	1.00
Suicide	/	/	/	1.00
Initial insomnia(Difficulty falling asleep)	/	/	/	1.00
Insomnia during the night(Restless, disturbed, waking at night)	/	/	/	1.00
Delayed insomnia(Waking in early hours of the morning and unable to fall asleep again)	/	/	/	1.00
Work and interest	/	/	/	1.00
Retardation (Slowness of thought, speech, and activity; apathy; stupor)	/	/	/	1.00
Agitation(Restlessness)	/	/	/	1.00
Psychiatric anxiety	/	/	/	1.00
Somatic anxiety (Gastrointestinal, indigestion, cardiovascular, palpitations, headaches, respiratory, genitourinary, etc.)	/	/	/	1.00
Gastrointestinal somatic symptoms(Loss of appetite, heavy feeling in abdomen, constipation)	/	/	/	1.00
General somatic symptoms(Heaviness in limbs, back, or head; diffuse backache; loss of energy and fatigability)	/	/	/	1.00
Genital symptoms(Loss of libido, menstrual disturbances)	/	/	/	1.00
Hypochondriasis	/	/	/	1.00
Weight loss	/	/	/	1.00
Insight(Must be interpreted in terms of patient's understanding and background)	/	/	/	1.00

Content Validity Index Calculation

Sleep quality

From S-CVI $= \dfrac{\Sigma I - CVI}{total\ questions}$

All three experts rated a score $= 3$ to each item.

From I-CVI $= \dfrac{The\ number\ of\ experts\ rated\ 3\ or\ 4}{Total\ experts}$

$= \dfrac{3}{3} = 1$

The Sleep quality questionnaires consist of 19 items. : $\Sigma I\text{-}CVI = 19*1 = 19$

S-CVI $= \dfrac{19}{19} = 1$

S-CVI > 0.8 : sleep quality questionnaire has CONTENT VALIDITY.

Depression

From S-CVI $= \dfrac{\Sigma I - CVI}{total\ questions}$

All three experts rated a score $= 3$ to each item.

From I-CVI $= \dfrac{The\ number\ of\ experts\ rated\ 3\ or\ 4}{Total\ experts}$

$= \dfrac{3}{3} = 1$

The depression assessment questionnaires consist of 17 items: $\Sigma I\text{-}CVI = 17*1 = 17$

S-CVI $= \dfrac{17}{17} = 1$

S-CVI > 0.8 : depression questionnaire has CONTENT VALIDITY.