

Prevalence of Insomnia and its Associated Risk Factors among University Students of Bangladesh

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of the requirements for the degree of
Bachelor of Pharmacy (Hons.)*

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Declaration

It is hereby declared that,

1. The thesis submitted is my own original work while completing bachelor's degree at Brac University.
2. The thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate reference.
3. The thesis does not contain material which has been accepted or submitted for any other degree or diploma at a university or other institution.
4. I have acknowledged all main sources of help.

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Approval

The thesis titled “Prevalence of Insomnia and its Associated Risk Factors among University Students of Bangladesh” submitted by Mehzebain Ifty (20146070) of Spring 2020 has been accepted as satisfactory in partial fulfillment of the requirement for the degree of Bachelor of Pharmacy (Hons.) on May 02, 2024.

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Ethics Statement

All survey data were collected from individual with their full consent and willingness.

Abstract

Insomnia is a common sleep disorder characterized by nocturnal and diurnal symptoms including dissatisfaction with sleep quantity or quality, trouble initiating or maintaining sleep and significant discomfort and impaired daytime performance. The prevalence of insomnia among university students globally is getting higher due to competitiveness in academic or job environments, technology dependency, unhealthy lifestyle, fear of failure and financial problems. This study aims to assess the prevalence of insomnia among university students of Bangladesh and to identify the potential risk factors associated with this. A survey-based study was conducted on 952 of students between 18 to 30 years from different universities of Bangladesh based on the AIS-8 scale and their demographic factors were also assessed. 587(61.6%) students among them were found to be insomniacs and significant correlation was found with their smoking habit, parent's status, academic performance and presence of chronic diseases.

Keywords: Insomnia; Sleep; Students; Prevalence; AIS-8; Risk Factors; Bangladesh.

Dedication

Dedicated to my family who supported me and motivated me to do my best.

Acknowledgement

Firstly, I express my gratitude to Almighty Allah, the source of all mercy and grace, for bestowing upon me the strength and bravery that have been my guideline throughout my academic journey. I would like to express my deepest gratitude to all those who provided immense support to complete this thesis.

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List of Acronyms

AIS-8	Athen's Insomnia Scale – 8
AASM	American Academy of Sleep Medicine
CBTI	Cognitive Behavioral Therapy for Insomnia
GABA	Gamma Amino Butyric Acid
ICSD	International Classification of Sleep Disorders
REM	Rapid Eye Movement
WHO	World Health Organization

Chapter 1

Introduction

1.1 Background Study

Sleep is a biological process which ensures the functioning of both physical and mental health including immune system, cognitive ability, memorizing ability, physical functioning, energy restoration capability, decision making process etc. Sleep is highly important because it allows the brain to filter through information and gives the nervous system a much-needed rest. Chronic sleep deprivation, which means having difficulties sleeping or staying asleep on a regular basis, result in missing out on essential restorative processes (Pedersen, 2022). Unfortunately, sleep deprivation has become a global concern. According to a recent study, over 35% of Americans are deprived of adequate sleep (Paprocki, 2022). Again, based on a study in 2023, around 50 to 70 million of them suffer from sleep-related disorders and 1 in 3—do not consistently obtain the required amount of uninterrupted sleep. Chronic sleep deprivation leads to insomnia which is one of the most common sleep disorders worldwide. It has been acknowledged as a problem for many members of society and among them university students are vulnerable because of their academic pressure or financial dependency. Statistically, up to 60% of undergraduates claim to have difficulty sleeping and 7.7% of them satisfy all the diagnostic criteria for insomnia which significantly affect student's day-to-day lives (American Sleep Apnea Association, 2024). Some common causes responsible for their condition includes unhealthy sleep patterns, irregular daytime routine, social life, competing demands in academic as well as professional life, dependency on technology or social media and last but not the least unhealthy eating habit and lifestyle (Schlarb et al., 2017).

1.1.1 Sleep

Sleep is a lowered mental and physical condition characterized by altered consciousness and partially suppressed sensory activity. There is a reduction in muscle activity and interactions with

the environment and the immune, neurological, skeletal, and muscular systems undergo restoration during sleep. These are essential processes that maintain mood, memory and cognitive function and play a significant role in the function of the endocrine and immune systems. The process of going from non-REM (slow eye movement) sleep stages to REM (rapid eye movement) sleep stages occurs gradually during sleep. Sleep is divided into five progressive stages by the AASM. The brain remains active during REM sleep, while cortical activity is modest throughout stages N1–N3 of non-REM sleep (Fuller et al., 2006). There is no specific number which can define the requirement of sleep, but it is considered according to many studies that babies require 16–18 hours of sleep every day. Children and teenagers in school require roughly 9.5 hours of sleep whereas most adults need seven to eight hours of sleep. On the other hand, people 60 years of age and older typically sleep for shorter durations of time (Brain Basics: Understanding Sleep, n.d.). Lack of sleep leads to daytime sleepiness, impaired mental health, irritability, altered mood, compromised cognitive function, reduced immune function and weight gain. If this deprivation is persistent and lasts for more than three times per week, it results in insomnia (Sleep Foundation, 2023).

1.1.2 Insomnia

Insomnia is a sleep disorder that manifests as difficulty in falling or staying in sleep and dissatisfaction with the quality and quantity of sleep (Morin et al., 2015). According to the International Classification of Sleep Disorders (ICSD-3), insomnia refers to the inability to get sleep, stay asleep, or have adequate good sleep which may result in daytime difficulties like exhaustion, frustration, and struggles focusing on various functions (Krystal et al., 2021). There are several theories to define insomnia. According to one common theory, it is a state of "hyperarousal" in which affected individuals are physically and cognitively activated while sleeping. Because insomniacs have higher heart rates, higher levels of the stress hormone cortisol and higher levels of rapid brain activity near sleep onset. However, not all people who suffer from insomnia show signs of "hyperarousal." Another theory claims that insomnia is

caused by a problem with sleep and wakefulness control. Several biological processes have been implicated in the regulation of sleep and wakefulness. Insomnia may develop if some of these pathways are disrupted. Advanced imaging and electroencephalographic techniques have revealed that people with and without insomnia have different brain functions. A model presented by Dr. Arthur Spielman in the 1980s, known as 3P model, summarizes three major variables that contribute to insomnia which are predisposing, precipitating and perpetuating factors (What Causes Insomnia, n.d.). The pervasiveness of insomnia has become a crucial public health concern throughout the world, especially within the global student population. 10 to 15 percent of people suffer from chronic insomnia, which lasts for several months (UpToDate, n.d.). Compared to men, women are 40% more prone to experience insomnia (Mong & Cusmano, 2016). Up to 75% of older adults experience symptoms of insomnia. A 2019 study found that older persons with insomnia had greater occurrences of several physical and psychological illnesses than older adults without insomnia (Nguyen et al., 2019). Insomnia has become a very common psychiatric problem among university students due to the rapid development of technology such as using social media, the internet, academic stress etc.

1.1.3 Normal Sleep Disorder vs Insomnia

Insomnia differs from the normal sleep disorder by the duration of difficulties, availability of adequate opportunities and the resulting effects. The diagnostic criteria for insomnia disorder are satisfied if the symptoms are experienced at least three times per week and for a minimum of three months. One of the main characteristics of insomnia is not a lack of opportunity, but the inability to fall asleep despite sufficient opportunity whereas normal sleep disorders usually occur due to different disruptions to sleep or lack of opportunities.

1.2 Research Gap

Research carried out in various academic environments has consistently revealed that university students have significant rates of sleep problems, impacting their general health, mental health, and most importantly their academic performance (Salmani et al., 2020). While

various studies have been conducted on insomnia among university students throughout the world, there is an alarming absence of study especially for Bangladeshi students. Also in existing studies, mostly it has been discussed as a secondary condition or the main concern was not the university students. This lack of attention is especially concerning given the specific societal backdrop and academic constraints that the target group faces. All these lead to failure in their academic, personal, social and economic life and to their inability to keep an effective role in the overall development of the country. This indicates a critical gap in the understanding of how prevalent insomnia is and its association with student demographics. Therefore, this study is designed to evaluate the prevalence, severity and associated risk factors of insomnia among Bangladeshi university students addressing this essential research gap and opening the path for targeted therapies and preventative efforts.

1.3 Objectives of the Study

The purpose of this study is to determine the prevalence and severity of insomnia in university students of Bangladesh using the AIS-8 scale and investigate potential factors that may contribute to its development.

This study is aimed to investigate the following research questions:

- a) What is the prevalence rate of insomnia among university students of Bangladesh?
- b) What is the severity of insomnia among university students of Bangladesh?
- c) What is the relation between various demographic variables and their insomniac condition?
- d) What are the impacts and associated risk factors behind insomnia prevalence?

1.4 Significance of the Study

As per the Global Insomnia Statistics 2022 and 2023, almost one in four individuals between the ages of 18 to 24 have insomnia on a regular schedule (29%). Also, another study suggests that 18.5% of university students eventually develop insomnia due to various factors like environmental, academic, demographic etc. (Global Insomnia Statistics in 2022 & 2024, n.d.). For a developing

country like Bangladesh increasing rate of insomnia among university students is a great concern as it can hinder the contribution of students to the development of countries. Therefore, this study will help to evaluate and explore the prevalence of insomnia among university students and identify the associated factors as well. By identifying key factors influencing prevalence targeted interventions and prevention strategies can be developed. This study has the potential to significantly improve sleep health outcomes and quality of life for individuals and communities by shedding light on the prevalence and contributing factors.

Chapter 2

Literature Review

2.1 Global Scenario of Insomnia

Insomnia is a significant chronic condition with reported rates of chronicity ranging from 24% to 45.8% (Roberts et al., 2008) and the most often reported sleep-related complaint in the primary care setting. An estimated 70 million and 2.2 million individuals in the US and Hong Kong, respectively, report experiencing symptoms of insomnia, according to epidemiological research done in these regions (Gaultney, 2010; Wong & Fielding, 2011). In the Middle East, insomnia is common, with studies indicating the incidence to be 66.7%, 63.9%, 64.4%, 48.4%, 61.4%, and 63% in the UAE, Kuwait, Saudi Arabia, Oman, Qatar, and Bahrain respectively (Metwally et al., 2023). In South Korea, almost 6% of individuals were diagnosed with this disorder (Ohayon & Hong, 2002). A meta-analysis conducted in China indicated a pooled prevalence of insomnia of 15% (Cao et al., 2017). In Malaysia, a survey among primary care patients found an estimated incidence of it ranging from 11 to 50 percent (Zailinawati et al., 2012). According to a European guideline, the prevalence of insomnia in Europe varies from a low of 5.7% in Germany to as high as 19% in France (Riemann et al., 2017). Chronic insomnia affects around one out of every ten persons in Europe and the frequency is rising (Ellis et al., 2023). Research in Bangladesh found a 70% prevalence of insomnia among post-menopausal women suffering from COVID-19, with 33.67% experiencing moderate severity, 25.11% subthreshold and 11.22% mild (Koly et al., 2023). Research on insomnia during the COVID 19 pandemic indicated a pooled prevalence of 35.7%, with rates ranging from 2.3 to 76.6% among young people in Bangladesh (Hasan et al., 2021).

University students are more susceptible to insomnia due to various factors. A systematic review reported an insomnia prevalence of 18.5% among university students, which is much higher among the overall population. The number of university students described as insomniacs varies,

from low rates of around 9% to high rates of between 38% and 71% (Jiang et al., 2015). Furthermore, 32.5% to 62.3% of university students in Nigeria, Libya, and Egypt had insomnia (Haile et al., 2017). Research in the South Asian area reported incidence rates of insomnia ranging from 35.4% to 70% among university students (Chowdhury et al., 2020). All these statistics reflect the concern of this disorder as well as emphasizing the urgent need to assess the depth and appropriate strategy to solve the problem.

2.2 Understanding the Complexity of Insomnia

Insomnia is defined as trouble falling asleep, sustaining sleep, or experiencing non-restorative sleep, which is followed by markedly reduced daytime performance in the absence of a specified medical, mental, or substance-related cause (Riemann et al., 2017). In sleep literature, insomnia is occasionally used to refer to polysomnographic evidence of disrupted sleep. Thus, a lengthy sleep latency, many nocturnal awakenings, prolonged periods of alertness throughout the sleep phase or even frequent transient arousals are considered indicators of insomnia. Thus, it has been considered both a symptom and a disorder (SUPPLEMENT PREVALENCE OF INSOMNIA, n.d.). Unfortunately, there is still no widely recognized model for the nature, etiology and pathophysiology of insomnia, despite advancements in this area. A deeper comprehension of the pathophysiology of insomnia may yield crucial insights into the circumstances and mechanisms underlying the disorder's development and maintenance as well as suggestive avenues for intervention and therapy (Levenson et al., 2015).

2.2.1 Models of Insomnia

There are some widely accepted models of insomnia containing the underlying mechanism of insomnia. The treatment strategy for insomnia is usually based on these models. For example, (Palagini et al., 2023)

- i. Stimulus Control Model.
- ii. Spielman Model

- iii. Neurocognitive Model
- iv. Psychobiological Inhibition Model
- v. Drosophila Model
- vi. Cano-Saper Model

Among them two most accepted models are described below.

Spielman model:

This model is also known as the Three factor model or 3P model or Behavioral model. A group of predisposing, precipitating, and perpetuating factors that could play a role in the onset and maintenance of insomnia are described in the "3P model". Three components interact to form the basis of the model. The predisposing and precipitating factors signify a stress-diathesis conception of the onset of insomnia. The third component, known as the perpetuating factor, indicates how behavioral factors influence chronicity (Palagini et al., 2023). Predisposing factors, like age or gender, increase susceptibility to insomnia, whereas precipitating factors, such significant stresses, trigger the onset of the disorder (Dikeos & Soldatos, 2005). The initial treatment strategy focuses on perpetuating factors, which include actions and attitudes that contribute to insomnia such as staying in bed longer. Excess scheduling worsens insomnia by increasing awake, fragmenting sleep, causing unpredictability in sleep scheduling and affecting the sleep environment (A Behavioral Perspective on Insomnia Treatment, 1987). This is a well-accepted model among patients and clinicians and “sleep restriction” therapy derived from this model is a key component of the treatment strategy of insomnia (Palagini et al., 2023).

Neurocognitive Model

The theory claims that insomnia is a hyperarousal condition including cortical, cognitive and somatic arousal that occurs throughout the entire day. Insomnia sufferers have lower decreases in relative metabolism from waking to non-REM sleep, indicating the involvement of interacting brain networks in the difficulty to fall asleep. These networks comprise a general arousal system, an

emotion-regulating system, and a cognitive system (Roth T., 2007). It varies from standard psychological and behavioral explanations of insomnia in that it emphasizes neurobiological factors. It is based on fundamental and clinical neuroscience research, providing an underlying brain foundation for insomnia, which differs from previously published models that lack neurobiological specificity. According to this model insomnia is defined by simultaneous sleep and wake-like activity patterns in key brain areas that regulate sleep-wake state and self-awareness. In the "normal" state, brain circuits and structures that control sleep and wakefulness provide proper psychophysiological arousal, circadian rhythms and homeostatic sleep drive. These structures include cortico-limbic circuits that regulate cognitive and emotional arousal as well as the default mode network, which may regulate self-awareness. Hypothalamic centers control the switching between sleep and wakefulness and brainstem-hypothalamic arousal centers innervate corticolimbic systems. Insomnia is associated with activation of corticolimbic and brainstem-hypothalamic areas as well as a relative increase in psychophysiological arousal (Buysse et al., 2011).

2.2.2 Molecular and Cellular mechanisms of Insomnia

Endogenous substances can be classified as either wake-promoting (e.g., catecholamines, orexin, and histamine) or sleep-promoting (e.g., GABA, adenosine, serotonin, melatonin, prostaglandin D2) (Griffith, 2013). Chronic insomnia occurs when the brain's wake-promoting and sleep-regulatory molecules disintegrate in alternating patterns (Backhaus et al., 2004). Insomnia patients have increased GABA in the occipital brain, supporting the hyperarousal theory (Morgan et al., 2012). All these molecules may have a local effect on neurons (Krueger et al., 2008). Neuronal usage is thought to influence local sleep propensity and slow wave amplitude through the buildup of sleep-regulating chemicals and synchronous firing within cortical columns is thought to spread slow wave activity to nearby areas via humoral and electric connections, eventually leading to sleep state throughout the body. In this sense, the mechanism of insomnia may not include the whole brain (Yoshida et al., 2004).

2.3 Types of Insomnia

Insomnia can be classified in several ways based on various factors. One of the common ways is classifying insomnia into two classes acute and chronic. Acute insomnia lasts for less than a week and sometimes resolves by itself and on the other hand 10 % of adults experience chronic insomnia, which is described as occurring three or more times a week for three months or more. It is necessary to evaluate and treat chronic insomnia. Another way is to classify insomnia based on the cause of the disease such as idiopathic (no known cause) or comorbid (related to another condition) which is more common in case of insomnia. Idiopathic insomnia is an exclusion diagnosis, but comorbid insomnia can be related to psychiatric diseases, medical problems, substance addiction, and specific sleep disorders (Passarella & Duong, 2008). A third approach is to categorize insomnia subtypes based on the specific sleep problem, such as sleep onset insomnia (difficulty falling asleep), sleep maintenance insomnia (difficulty staying asleep) or early morning awakenings insomnia (too early awakening) (Insomnia, n.d.).

2.4 Factors Contributing to Insomnia

Though the exact etiology of insomnia is still unknown but there are some factors which trigger the development of insomnia. All these factors interplay in a complex way and cause insomnia.

A) Medical or Psychiatric Illness: There are various medical condition like ongoing pain, cancer, diabetes, heart disease, asthma, gastroesophageal reflux disease (GERD), overactive thyroid, Parkinson's disease and Alzheimer's disease which may trigger the incidence of insomnia (Insomnia - Symptoms and Causes - Mayo Clinic, 2024). In addition, insomnia is strongly associated with a variety of mental health conditions. It can be a risk factor, comorbid condition or transdiagnostic symptom for a wide range of mental diseases, including mood and anxiety disorders, as well as schizophrenia (Palagini et al., 2022). Depression, anxiety, or psychological stress account for around 50% of insomnia cases (Sleep Disorders | NAMI: National Alliance on Mental Illness, n.d.).

B) Medicines and Drugs: Herbal drugs, prescription drugs or OTC drugs can have a crucial role as a causative agent of insomnia (Lie et al., 2019). Certain drugs including cold and allergy decongestants, beta-blockers, sedative, asthma medications and ACE inhibitors might interrupt sleep and cause insomnia (PharmD, 2023). Polypharmacy may also provide distinct concerns for pharmaceutical side effects, magnifying the effects of each prescription and raising the risk of insomnia (Do, 2020). Individuals dependent or addicted to a drug may experience sleep disruptions due to factors such as drug nature and quantity, addiction length, mode of administration, state of intoxication or withdrawal, and concurrent use of stimulants and depressants (Grau-López et al., 2020). The association between sleep disorders and drug abuse is bidirectional because persons who have difficulty sleeping may use substances to self-medicate and consuming certain substances can interfere with sleep (Substance Abuse and Insomnia, 2017).

C) Behavioral Factors and Lifestyles: Daily habits and lifestyle can have a constant effect on sleep and may lead to insomnia. Certain habits, like drinking excessive amounts of coffee or alcohol or smoking might increase the possibility of insomnia. Irregular and poor sleeping patterns might contribute to insomnia (Risk Factors for Insomnia, n.d.). Screen use can be a substantial contributor to insomnia, particularly among teens (Hale et al., 2018). Several studies have linked screen time to worse sleep quality, greater sleep start latency, and higher daytime weariness. Screens produce blue light, which suppresses melatonin synthesis and makes falling asleep harder (Screens and Your Sleep: The Impact of Nighttime Use | Sutter Health, n.d.). The material on the screen can be psychologically stimulating, keeping the brain engaged and making it more difficult to relax and fall asleep (News-Medical, 2021). The social and physical environment in which individuals work, play, and live have an impact on sleep length and the likelihood of sleep disruptions (Risk Factors for Insomnia, n.d.).

D) Demographic Factors: Age, sex, family type, education level or other demographic factors have significant effect on the development of insomnia. Here in this study these demographic

factors have been considered.

- **Age:** Age has a significant impact on insomnia. Research suggests that older people, especially those aged 60 and above, are more prone to insomnia. This vulnerability can be linked to a variety of causes, including changes in internal circadian clocks and sleep-wake cycles, as well as the increased incidence of medical and psychological problems within this age group (Fry & Fry, 2023). Research indicates that insomnia is more common in middle-aged and older people, and it worsens with age. While insomnia is not considered a typical aspect of the aging process, its prevalence does seem to increase with age (Brewster et al., 2018).
- **Sex:** According to the study, females are more prone to develop insomnia. A meta-analysis suggests that risk ratio of insomnia for female versus male was 1.41 which means women are more prone to develop the disorder (Zhang & Wing, 2006). According to another study, females are around 1.6 times more likely than males to have insomnia which increases with age. Differences between men and women in insomnia may be explained by differences in the incidence of mental illnesses, symptom endorsement, gonadal steroids, sociocultural variables, and coping tendencies (Li et al., 2002).
- **BMI (Body Mass Index):** Obesity has a close connection with insomnia as it affects the metabolism process as well as the sleep cycle of an individual (Pagán, 2021b). Previous research has shown that obese people are more prone to experience insomnia or difficulties sleeping. Furthermore, throughout a 7.5-year follow-up period, obese people were more likely to acquire chronic insomnia (Haile et al., 2017b).
- **Academic Pressure:** A study says 3 out of 5 students suffer from insomnia and among them 9.4% to 38.2% are university students due to excessive academic stress, hectic routine, competitive environment (Haile et al., 2017b).
- **Marital and Family Status:** A study in Japan found that divorced males and single,

divorced, and married women living alone had greater insomnia related symptoms than married couples living with other family members in Japan. This relationship was more pronounced among unemployed males (Kawata et al., 2019b). Research on midlife women discovered that being married was related with improved sleep outcomes, but the results were not statistically significant after correcting for relevant demographic characteristics (Troxel et al., 2010). Though it is not specific which type of family contributes more to the development of insomnia, the effect of relationship with other family members may have a crucial role (Ailshire & Burgard, 2012).

- **Living Environment:** People living in the urban area are more prone to insomnia. In research, the percentage of urban residents having insomnia symptoms was higher (23.4%) than the percentage of rural people (21.2%) (Zheng et al., 2018). Reasons behind these differences might be the lingerie exposure to lights or noise, social or cultural habits, hectic and complex nature, toxic environments (Risk Factors for Insomnia, n.d.). Also, people living in urban areas are more prone to various chronic diseases which can be another underlying reason (Riedel et al., 2012).

2.5 Symptoms and Consequences of Insomnia

Symptoms of insomnia include staying up late in bed in anticipation of sleep, which is more typical among young adults, disrupted sleep, which is more typical among senior citizens, waking up in the middle of the night, early wake-time with a difficulty to get back to sleep. Inadequate sleep causes feelings of exhaustion, irritability, depression, and impairs one's ability to focus and conduct daily tasks. Even after utilizing popular techniques to enhance sleep, symptoms still exist. Major consequences of insomnia involve psychiatric disorders like depression, anxiety, memory loss, increased risk of heart disease, impaired cognitive function (What Causes Insomnia, n.d.).

2.6 Assessment, Diagnosis & Management of Insomnia

Assessment of insomnia may include chief complaints of patient, current sleep history, sleep wake schedule, bedtime routine assessment, nocturnal behavior, physical examination, daytime function assessing, medication, previous medical history and last but not the least 3P Model which help clinician to understand the sleep history of the patient. To diagnose insomnia, three criteria must be met including a complaint of difficulty falling or staying asleep, appropriate opportunity for sleep, and daytime dysfunction. There are also some insomnia assessment tools like sleep diary, actigraphy, personal monitoring device, polysomnography and questionnaire. One questionnaire tool that has been widely utilized to evaluate insomnia issues is the eight-item Athens Insomnia Scale (AIS-8). The purpose of this evaluation tool is to investigate the AIS 8's component structure, the incidence rates of insomnia issues and the factors' relationships to demographic traits. After diagnosing insomnia commonly there are two available treatments for insomnia such as nonmedication treatments, most notably cognitive behavioral therapy for insomnia or CBTI, and a variety of pharmacologic therapies, including benzodiazepines, z-drugs, melatonin receptor agonists, selective histamine H1 antagonists, orexin antagonists, antidepressants, antipsychotics, anticonvulsants and nonselective antihistamines. CBTI and other therapeutic medications like hypnotics combinedly provide better effect but experts discourage the long-term use of hypnotics. Also, melatonin supplements are not usually suggested for insomnia (Krystal et al., 2021).

Chapter 3

Methodology

3.1 Research Design

The survey-based study was conducted with the help of a questionnaire based on AIS-8 scale (Athens Insomnia Scale) between September 2023 to February 2024. The demographic factors of samples were also assessed to analyze their correlation with insomnia. The careful designing assures precise and trustworthy data, making it the best tool for measuring insomnia in this study.

3.2 Population and Sampling

Sample of the study consisted of university students between age of 18 to 30 years who were chosen by random sampling from different universities across Bangladesh. The sample size was 952 where the number of male and female participants were 477 (50.1%) and 475 (49.9%) respectively.

Inclusion Criteria: In this study undergraduate and postgraduate students of any public, private and national universities in Bangladesh were considered.

Exclusion Criteria: Students who had provided inappropriate or inadequate data were excluded from the study.

3.3 Survey Instrument

A questionnaire based on the AIS-8 scale and sixteen relevant demographic factors were developed as the survey tool. Existing scale was examined, relevant and understandable question types were developed and piloted with participants and validated using expert judgment and statistical analysis. This multi-step method resulted in a strong and dependable instrument for analyzing insomnia, which strengthened the foundation of results. The frequency of insomnia was measured through validated ‘Athens Insomnia Scale’. This scale consisted of 8-item questionnaire with each item consisting of 4 points showing insomnia severity from none to severe levels (0-3). To get an individual total score, a score on each item of ‘Athens Insomnia Scale’ was added (score 0 to 24); the higher score indicates

the increased severity of the condition. Students who had score of 6 or greater were considered insomniac. Evaluation of insomnia was done based on the following scale.

Table 1: *Severity Score of Insomnia based on AIS-8 Scale*

Score	Severity of Insomnia
0 – 5	No Insomnia
6 – 14	Mild Insomnia
15 – 21	Moderate Insomnia
22 or greater	Severe Insomnia

3.4 Data Collection Procedure

In-person surveys were chosen to be conducted on various university campuses, allowing for personal interaction and explanation of any questions. This direct method also assisted in mitigating potential online survey biases, for example, non-response bias and social desirability bias. Throughout the process, ethical considerations were crucial. All participants signed informed consent forms, assuring openness and respect for their autonomy. Their replies were kept anonymous and rigorous data security procedures were put in place to safeguard their privacy. Furthermore, various student organizations and university administration helped to publicize the survey and emphasize its potential influence on student well-being.

3.5 Data Analysis Procedure

Statistical analysis for this study was done using Microsoft Excel 2016 and Statistical Packages for Social Sciences (SPSS version 29.0). Initially data recording and processing including editing, sorting, coding and classification was done through Microsoft Excel 2016 and then further analysis was done in IBM SPSS to understand the correlation, demographic profile of the participants and so on. First, basic descriptive statistics were performed to summarize the demographic profiles of the participants and the differences in insomnia in demographic variables were analyzed by performing independent sample T test. Finally, we utilized Pearson χ^2 tests of independence for comparing the distribution of dependent categorical or nominal variables with the criterion variable. Binary logistic

regression was done to understand the correlation. P-value of <0.05 was considered to represent a statistically significant correlation.

Chapter 4

Result

This chapter aims to provide a clear presentation of the study findings. It contains the result and statistical analysis conducted for the study.

4.1 Characteristics of the Study Participants

Table 2 and Table 3 present the demographic characteristics of the participants. The sample size was 952 and it was comprised of a similar proportion of females (49.9%) and males (50.1%). The mean age of the participants was 22.34 years (SD=2.030) with a range of 18-30 years. Demographic profile of the participants revealed that majority 900(94.5%) belonged to the group of 18-25 years, 870 (91.4%) were unmarried, 840 (88.2%) were undergraduate, 735 (77.2%) were from nuclear family, 617 (64.8%) were not involved in relationship, 687(72.2%) were living with their family and 817 (85.8%) didn't have chronic diseases. Higher number of participants (52.4%) were from rural area of Bangladesh. Their economical profile shows that 568 (59.7%) were from low class, 335 (35.2%) were from middle class and only 49(5.1%) were from high class family. Additionally, parental status was examined with 915 (96.1%) having not separated parents and 37(3.9%) having separated parents. Lastly, among all participants 221 (23.2%) were obese having their BMI above 25 and 90(9.5%) of the participants were smokers.

Table 2: Characteristic of the Participants

Variables	Mean	Minimum	Maximum	SD
Age in years	22.34	18	30	2.03
BMI (kg/m2)	22.89	11.58	84.53	5.10
Academic Performance (CGPA)	3.32	0.0	4.0	0.46
Family Income (KBDT)	49.36	5	350	45.64
Number of Siblings	-	0	10	1.50

Table 3: Characteristics of the Participants

Variables	Categories	Frequency (%)
Age	18-25	900 (94.5)
	26-30	52 (5.5)
Sex	Male	477 (50.1)
	Female	475 (49.9)
BMI	Below 18.5	148 (15.5)
	18.5 – 25.5	583 (61.2)
	Above 25.5	221 (23.2)
Marital status	Married	82 (8.6)
	Unmarried	870 (91.4)
Educational level	Undergraduate	840 (88.2)
	Graduate or above	112 (11.8)
Economic Impression	Low	568 (59.7)
	Medium	335 (35.2)
	High	49 (5.1)
Family Types	Nuclear	735 (77.2)
	Joint	217 (22.8)
Parent status	Not Separated	915 (96.1)
	Separated	37 (3.9)
Siblings	Yes	832 (87.4)
	No	120 (12.6)
Involved in Relationship	Yes	335 (35.2)
	No	617 (64.8)
Living Status	With Family	687(72.2)
	Without Family	265(27.8)
Smoking Habit	Non-smoker	862 (90.5)
	Smoker	90 (9.5)
Residence Area	Rural	499(52.4)
	Urban	453(47.6)
Chronic Disease	Yes	135 (14.2)
	No	817 (85.8)

*n = 952

4.2 Prevalence of Insomnia

Figure 1 presents the prevalence of insomnia among university students of Bangladesh where 587 (62%) are insomniacs and 365 (38%) are non-insomniacs.

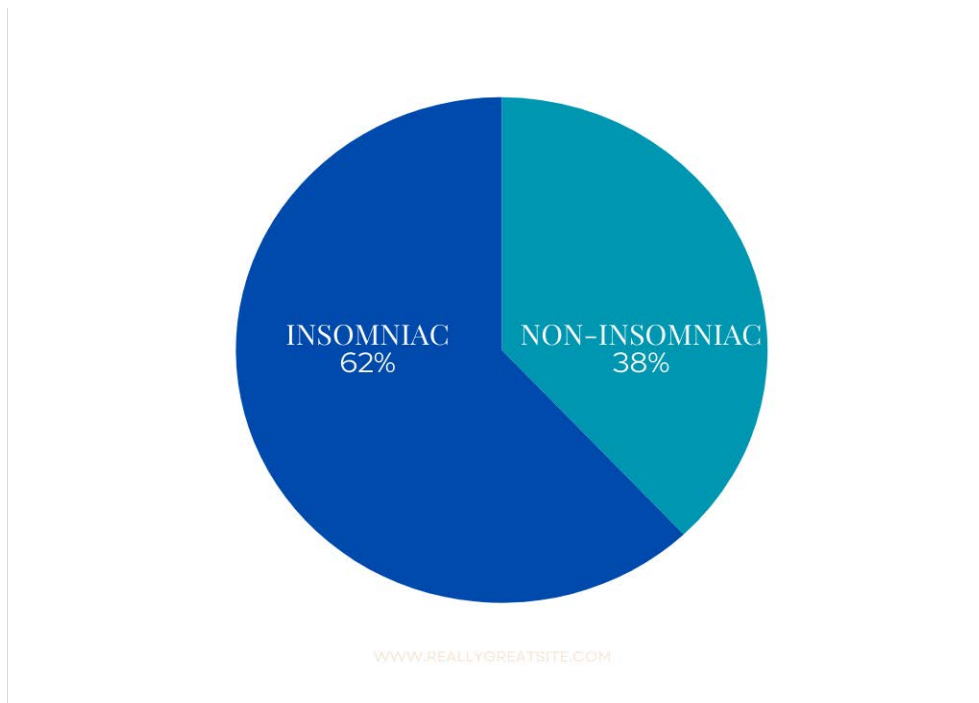


Figure 1: Prevalence of Insomnia among University Students of Bangladesh

4.3 Responses of Participants to Athen's Insomnia Scale

Table 4 shows the frequency of responses for each parameter measured during the application of AIS scale while determining the prevalence of insomnia. The highest response for each question has been marked bold for better understanding.

Table 4: Breakdown of Responses to Athens Insomnia Scale

SL No	Questions	Score	Frequency of response	Graphical Presentation
01	Sleep induction time	0	294	0 1 2 3
		1	331	
		2	209	
		3	118	
02	Awakenings during the night	0	385	0 1 2 3
		1	363	
		2	158	
		3	46	
03	Final awakening earlier than desired	0	472	0 1 2 3
		1	303	
		2	120	
		3	57	
04	Total sleep duration	0	368	0 1 2 3
		1	348	
		2	172	
		3	63	
05	Overall quality of sleep	0	363	0 1 2 3
		1	384	
		2	154	
		3	51	
06	Sense of well-being during the day	0	340	0 1 2 3
		1	340	
		2	194	
		3	78	
07	Functioning during the day	0	344	0 1 2 3
		1	339	
		2	196	
		3	73	
08	Sleepiness during the day	0	207	0 1 2 3
		1	413	
		2	226	
		3	105	

4.4 Severity of Insomnia

Figure 2 is a pictorial representation of the severity of insomnia among university students of Bangladesh. Among all participants 38% are non-insomniac and 47% have mild insomnia which is the highest among all, 13% have moderate insomnia and the other 2% have severe insomnia.

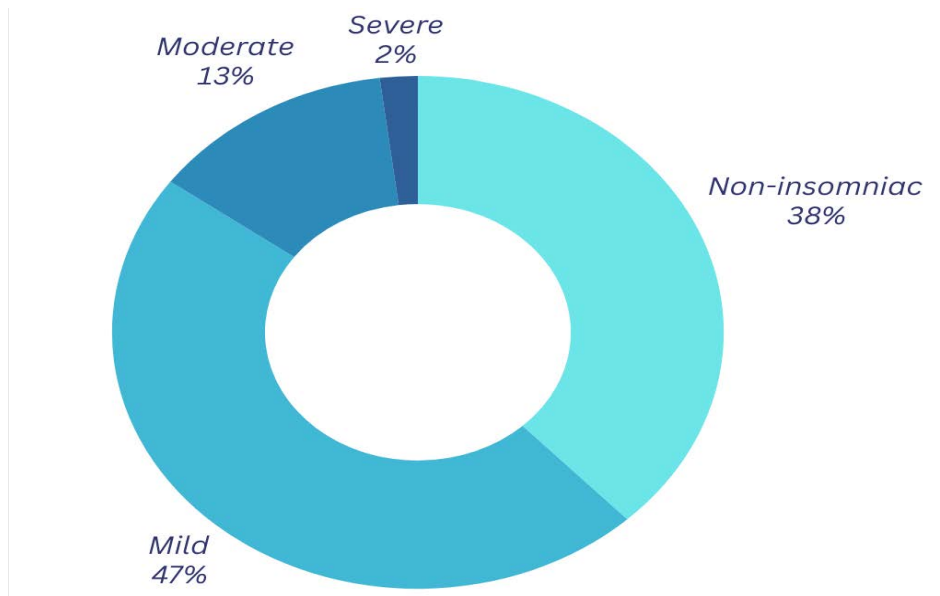


Figure 2: Severity of Insomnia

4.5 Bivariate Results

Table 5 and Table 6 display the results of the Pearson Chi-Square analysis. According to Athens Insomnia Scale, 583(61.2%) participants were insomniacs whereas 369(38.8%) were non-insomniacs. Out of 583 insomniac students 293 were female and 293 were male. Most of the insomniac students 551 were between 18-25 years and only 35 of them belonged to the group of 26-30 years. Also, occurrence of insomnia was higher among participants with BMI range between 18.5-25.5 (359) and most of them was unmarried (530), undergraduate (511), belonged to low class family (340), nuclear family (460), not involved in relationship (375), live with family (423), have siblings (502), no smoking habits (521), no chronic disease (481) and live in rural area(295). The Pearson chi-square test identified that there were no statistically significant associations between

prevalence of insomnia and age ($X^2 [1] = 0.77, p = .380$), sex ($X^2 [1] = 0.007, p = .935$), BMI ($X^2 [2] = 4.812, p = .090$), marital status ($X^2 [1] = 1.721, p = .190$), economical impression ($X^2 [2] = 2.384, p = .304$), educational level ($X^2 [1] = 1.57, p = .210$), family type ($X^2 [1] = 1.447, p = .229$), involvement in relationship ($X^2 [1] = 0.447, p = .504$), living status ($X^2 [1] = 0.00, p = .986$) and residence area ($X^2 [1] = 2.630, p = .105$). On the other hand, statistically significant association was found with age ($X^2 [1] = .074, p = .023$), parents' status ($X^2 [1] = 4.604, p = .032$), having siblings ($X^2 [1] = 4.138, p = .042$), smoking habit ($X^2 [1] = 4.780, p = .029$) and presence of chronic disease ($X^2 [1] = 17.795, p = <0.001$).

Table 5: *Correlation between Nominal Variables and Insomnia*

AIS Score vs	Variables	p value	Pearson correlation value
	Age	.023*	.074
	BMI	.061	.061
	Academic performance	.896	-.004
	Family income	.215	.040
	Number of siblings	.093	-.055
	Rank	.238	-.038

***p < 0.05**

Table 6: Bivariate Association between Categorical Variables and Insomnia

Variables	Categories	Insomnia		p value
		Yes (587)	No (365)	
Age	18-25	551	349	.380
	26-30	35	17	
Sex	Male	293	184	.935
	Female	293	182	
BMI	Below 18.5	81	67	.090
	18.5 – 25.5	359	224	
	Above 25.5	146	75	
Marital status	Married	56	26	.190
	Unmarried	530	340	
Educational level	Undergraduate	511	329	.210
	Graduate or above	75	37	
Economic Impression	Low	340	228	.304
	Medium	212	123	
	High	34	15	
Family Type	Joint	126	91	.229
	Nuclear	460	275	
Parents status	Not Separated	557	358	.032*
	Separated	29	8	
Siblings	Yes	502	330	.042*
	No	84	36	
Involved in Relationship	Yes	211	124	.504
	No	375	242	
Living status	With family	423	264	.986
	Without family	163	102	
Smoking Habit	Non-smoker	521	341	.029*
	Smoker	65	25	
Residence Area	Urban	291	162	.105
	Rural	295	204	
Chronic Disease	Yes	105	30	<.001*
	No	481	336	

*p < 0.05

4.6 Binary Logistic Regression

The results of logistic regression predicting insomnia are shown in Table 7. The presence of insomnia was statistically insignificant with other variables except presence of chronic disease.

Table 7: Result of Logistic Regression Analysis

Characteristics	B	S.E.	OR	95% CI for OR		p value
				Lower	Upper	
Age: 26-30						
18-25*	-.128	.348	.880	.445	1.742	.714
Sex: Male						
Female*	.014	.145	.986	.742	1.310	.923
BMI: Below 18.5						
18.5 – 25.5*	.262	.193	1.300	.890	1.898	.174
Above 25.5*	.362	.228	1.437	.918	2.247	.112
Marital status: Unmarried						
Married*	.308	.265	1.361	.810	2.288	.245
Educational level:						
Undergraduate	-.079	.245	1.083	.669	1.751	.746
Graduate or above*						
Economic Impression: Medium						
Low*	.207	.338	1.230	.634	2.384	.541
High*	-.029	.169	.972	.697	1.354	.865
Family Type: Nuclear						
Joint*	-.163	.165	.850	.614	1.175	.325
Parent status: Separated						
Not Separated*	-.623	.420	.536	.236	1.222	.138
Siblings: No						
Yes*	.331	.219	1.392	.906	2.140	.131
Involved in Relationship: Yes						
No*	.045	.147	1.046	.784	1.395	.762
Living status: Without family						
With family*	.022	.156	1.022	.753	1.387	.889
Smoking Habit: Smoker						
Non-smoker*	-.345	.275	.708	.413	1.213	.209
Residence area: Urban						
Rural*	-.103	.173	.903	.643	1.266	.553
Chronic Disease: Yes						
No*	-.876	.224	.416	.268	.646	<.001*

*Reference category *p < 0.05

4.7 Comparison of variables between Insomniac and Non-insomniac Participants

An independent samples t-test was performed to compare age, BMI, academic performance, family income, number of siblings and AIS score among insomniac and non-insomniac subjects. At first a normality test was done, and it was observed in Figure 3 and Figure 4 that the sample was not normally distributed. The central limit theory suggests that sample distribution moves toward normality as the sample size increases. So, the sample size is 952 which is large and according to central limit theory parametric tests like t tests can be done even if the sample is not normally distributed.

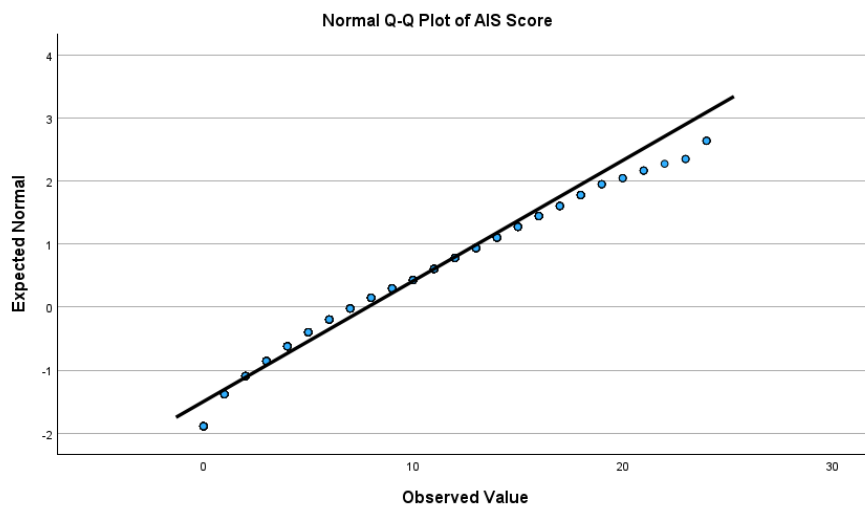


Figure 3: Normality plot

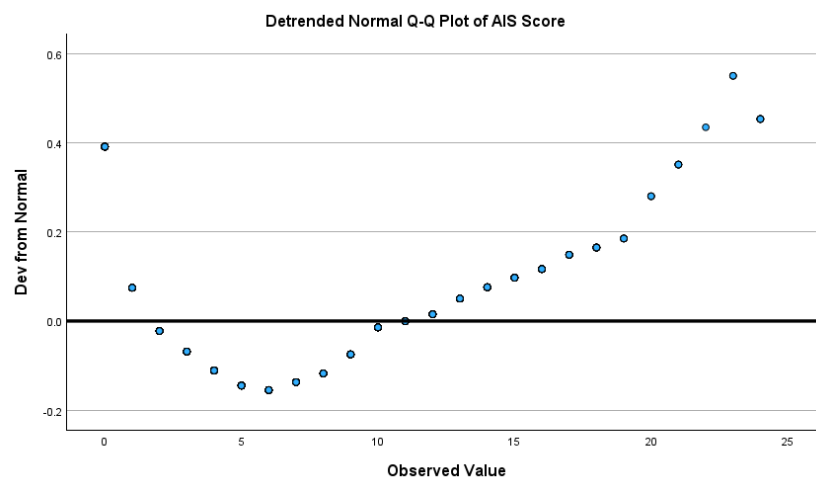


Figure 4: Normality Deviation from Expectation

Table 8 presents the result of independent sample t tests. As shown in the table, the observed factors for two different subjects are slightly different including the mean and standard deviation for each group, as well as the p-value from the t-test. The p value is insignificant in all other cases except the academic performances where p value= 0.037.

Table 8: Comparison of factors between insomniac and non-insomniac subjects

Variables	Insomnia	Mean	Standard Deviation	t value	p value*	Confidence Interval (95%)	
						Lower	Upper
Age	Yes	22.45	2.093	2.105		.019	.549
	No	22.16	1.914	2.149	.228	.025	.544
BMI	Yes	23.06	4.81	1.276		-.233	1.10
	No	22.63	5.55	1.234	.860	-.256	1.12
Academic Performance	Yes	3.33	0.43	.208		-.054	.067
	No	3.31	0.51	.200	.037*	-.057	.071
Family Income	Yes	50.61	48.19	1.068		-2.72	9.21
	No	47.36	41.18	1.107	.432	-2.51	9.00
Number of Siblings	Yes	2.19	1.52	-1.591		-.356	.037
	No	2.35	1.47	-1.602	.780	-.355	.036
Sibling Rank	Yes	1.63	1.264	-.635		-.218	.111
	No	1.68	1.244	-.637	.513	-.217	.111

*p value < 0.05

Chapter 5

Discussion

5.1 Prevalence and Severity of Insomnia

The prevalence rate of insomnia among university students of Bangladesh was 61.6%. Among 952 university students, insomnia was present among 587 students and 365 were non-insomniac based on the Athen's Insomnia Scale. Similarly, Chowdhury et al., observed the prevalence rate of 35% to 70% among the university students of South Asian region. The majority (47%) of insomniac students had mild insomnia and 13% had moderate level and 2% had severe level insomnia. During data collection many students expressed that the heavy burden of academic pressure, family pressure, dependency on others, job crisis was greatly responsible for the presence of insomnia in them. The breakdown of responses to Athen's Insomnia Scale (Table 4) shows that most of the students face difficulties in sleep induction, having good quality sleep and having sleepiness during days. Other symptoms were also more or less present among the students.

5.2 Insomnia and its association with Demographic Factors

There are various demographic factors which influence insomnia among students.

Age: The age range of the sample was 18 to 30 years old, and it has been divided into two group ranges, 18-25 (900) and 26–30 (52) years. From 18-25 years group 551 and from 26-30 years group 35 were found to have insomnia. In Pearson correlation analysis it was observed that age has statistically significant association with the AIS score having the p value of .023. But the correlation value is .074 which indicates a weak positive correlation. From the analysis it can be said that though the correlation is weak, AIS score will slightly increase as the age increases. It could be a possible reason for the increased prevalence of insomnia among elderly people.

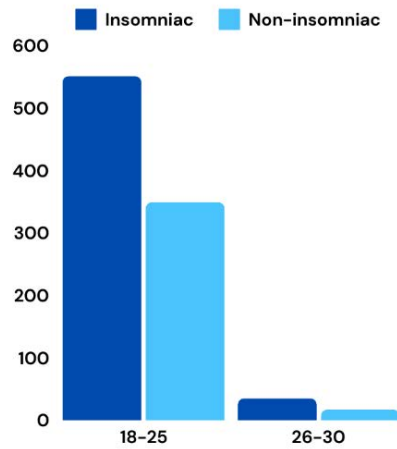


Figure 5: Age and Insomnia

Sex: Among 952 students, number of male and female was 477 and 475 respectively. Insomnia was prevalent among 293 male participants and 293 female participants. There was no significant association was found between sex and the occurrence of insomnia.

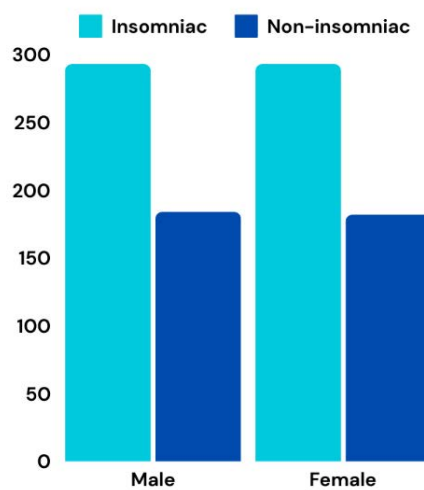


Figure 6: Sex and Insomnia

Body Mass Index (BMI): Participant's height and weight was collected through survey form and the using Microsoft Excel body mass index was calculated in kg/m^2 . The obtained BMI was grouped into three categories which includes below 18.5 where 81 were insomniacs, 18.5 to 25.5 where 359 were insomniacs and above 25.5 where 146 were insomniacs. No statistically significant relation was found with BMI. But many overweight participants had been informed about having chronic diseases which hinder their sleep. BMI is significantly associated with age and age ($p=<0.01$) and age has significant association with AIS score. So, increased BMI may have indirect influence on prevalence of insomnia.

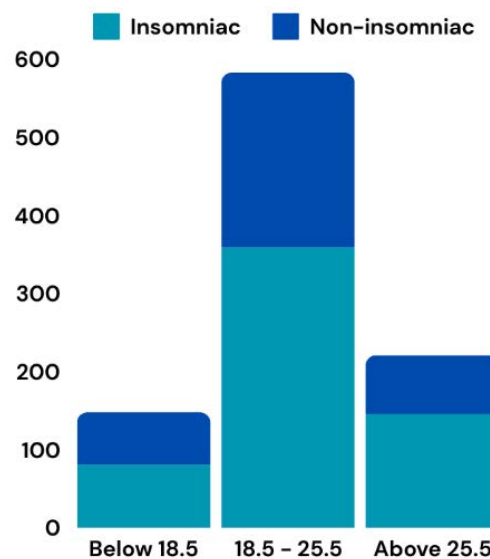


Figure 7: BMI and Insomnia

Marital Status: Sample consists of 82 married students and 870 unmarried students. Insomnia was found in 56 married and 530 unmarried participants. Marital status has no significant association with the presence of insomnia. Responsibility of marriage and family pressure was one of the biggest complaints from married men and women. It can trigger insomnia among them as well.

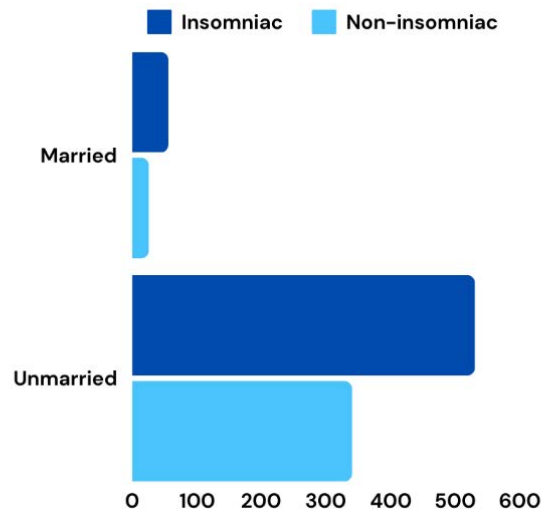


Figure 8: *Marital Status and Insomnia*

Education Level: Responses were collected from both undergraduate and graduate students of all over Bangladesh. 511 undergraduates and 75 graduated were suffering from insomnia. No statistical significance was found between education level and insomnia. As the education level increases and becomes more difficult and advanced, academic stress increases which can trigger insomnia among students.

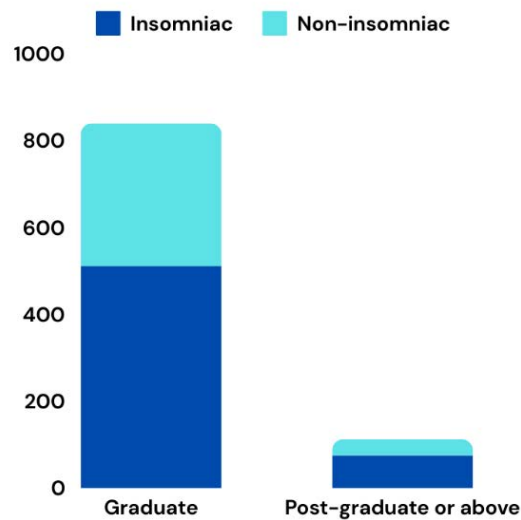


Figure 9: *Education level and Insomnia*

Academic Performance: Academic performance of the participants was measured in CGPA. Independent sample t test shows a statistically significance differences in academic performance between insomniac and non-insomniac student, $t = .200$ and $p = .037$. To maintain a good academic profile student, need to stay awake at night for study purposes and this habit may lead to insomnia among them.

Family Income: Based on their family income participants were categorized into three groups, low, medium and high class. Most of the students having insomnia (340) were from low-income families and 212 were from middle class and 34 of them were from high class families. Significance association was not found in any of the analysis.

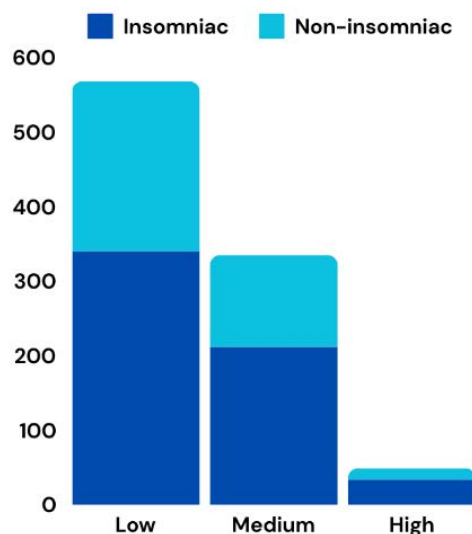


Figure 10: Economic Impression and Insomnia

Family Type: The sample comprised of two types of family such as nuclear family and joint family. Insomnia was more prevalent among students (460) living in nuclear families and 126 sufferers were from joint families. Family types also have no significant influence on the presence of insomnia.

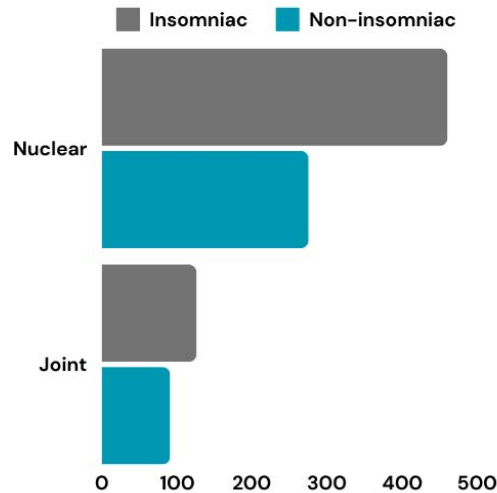


Figure 11: Family types and Insomnia

Parent's Status: Parent's marital status has a significant impact on the mental health of the students. Thus, it can influence the occurrence of insomnia among them. Among 587 insomniac students, parents of 575 students were not separated and other 29 had separated parents. Pearson correlation test reveals that parent's status is significantly associated with the presence of insomnia having the p value of .032. Separation between parents may lead to stress and other triggering factors that hinder the quality and quantity of sleep among students.

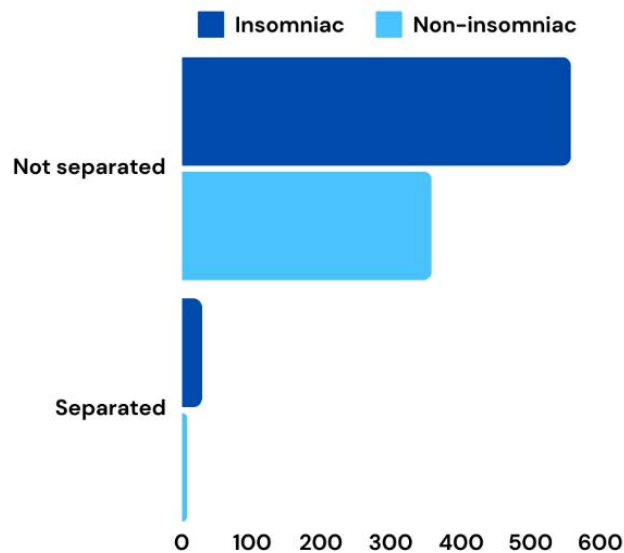


Figure 12: Parent's status and Insomnia

Sibling Number & Rank: Number of siblings and rank among them was considered as it can have an indirect influence on the prevalence of insomnia. Though significant association was found between the number of siblings and prevalence of insomnia. But there is a lack of statistics to prove this relationship.

Involvement in Relationship: The sample consists mostly of participants who were not involved in relationships. 211 insomnia sufferers were involved in relationships whereas 375 of them were not involved in relationships. No statistical significance was found in any of the performed analysis.

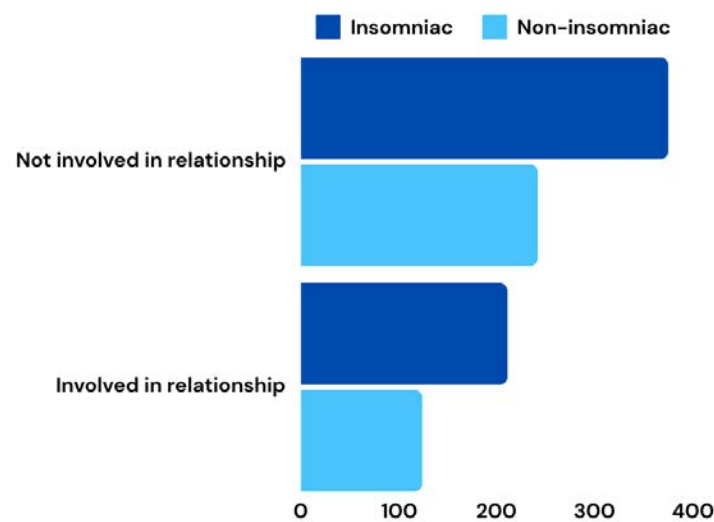


Figure 13: Involvement in relationship and Insomnia

Living Status: Though most participants were living with their family but many of them were living without their family due to study purposes. 423 insomniac students were living with their families and 163 were living without their families. No association was observed between their living status and the condition.

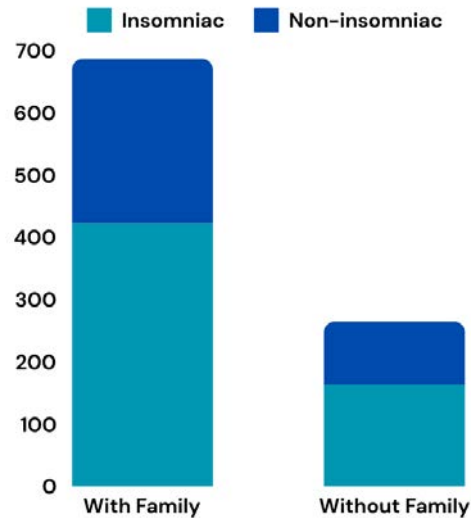


Figure 14: Living status and Insomnia

Smoking Habit: Smoking habit has significant physical consequences which may result in insomnia. Among all insomniac participants 521 were non-smokers and 65 were smokers. 75% of smoking students were suffering from insomnia and most of them had inadequate sleep. They complaints to have bad quality sleep. Pearson chi square analysis revealed that smoking habit is statistically significant with the presence of sleep ($p=.029$). Long term smoking habit can increase the chance of having insomnia.

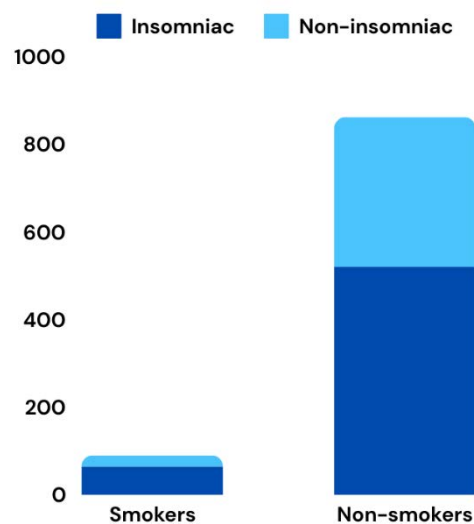


Figure 15: Smoking habit and Insomnia

Presence of Chronic Diseases: Chronic disease may disrupt the quality and quantity of sleep. Among 135 participants who had chronic disease 130 were insomniac. Many participants with chronic disease complained of not being able to sleep at night and felt tired during daytime. Pearson chi square analysis and logistic regression analysis both shows that chronic disease is significantly associated with the prevalence of insomnia ($p = <0.001$). There is a strong correlation and if a particular participant has chronic disease, it means that he has a greater chance of having insomnia.

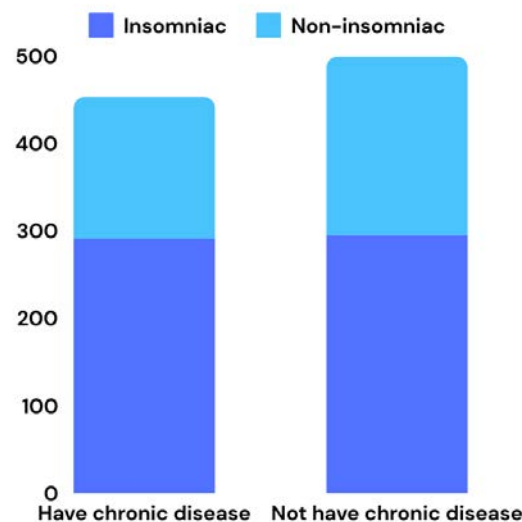
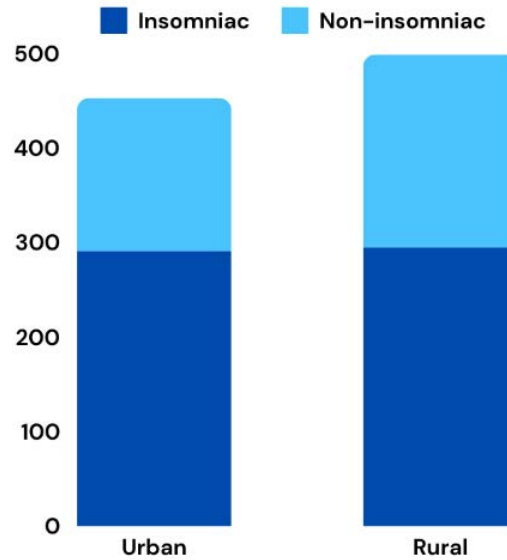


Figure 16: Presence of chronic disease and Insomnia

Residence Area: Sample comprised of participants from both urban and rural areas of Bangladesh. Among 587 insomniac students 295 were from rural areas and 291 were from urban areas. No significant association was found between residence area and insomnia.



Figures 17: Residence area and Insomnia

5.3 Limitation

The survey study based on Athen's Insomnia Scale was performed to understand the scenario of insomnia among university going students of Bangladesh. This study was designed and executed carefully with the observation of experts to ensure the effectiveness and accuracy of the result. However, there were some limitations which need to be overcome to increase the accuracy of the result.

- I) The survey questionnaire contained a total of 24 questions which discouraged a lot of participants, and it may have affected their responses.
- II) Sample size consists of 952 students which does not represent the total university students of Bangladesh.

5.4 Conclusion

According to the findings of the study it can be concluded that prevalence rate of insomnia among university students of Bangladesh were 61.6%. Most of them had mild insomnia. It was also observed that demographic factors of the participants have influence on the prevalence. A significant association was found with age, academic performance, parent's status, smoking habit of participants and presence of chronic disease among them. University students are more crucial to have insomnia due to various factors like academic stress, lack of confidence, dependency on others, career stress etc. Assessing the correlation between demographic factors and insomnia revealed a better understanding of where works need to be done to make this important population healthier and stronger. Insomnia is indeed a curse for any population, most importantly for students as they are the future of the world. This study is a step towards a better understanding of the reasons responsible for the increased rate of insomnia among students and towards the finding of effective solutions to get rid of this curse.

5.5 Future Recommendations

More surveys regarding insomnia need to be done on various populations to have a deep understanding of the problem as there is a lack of study about it in our country. Larger sampling may increase the accuracy of such types of study. Also, other factors along with demographic factors which influence insomnia should be assessed. Last but not the least awareness should be spread among the population of both rural and urban area and effective strategies should be planned and implemented.

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Appendix A

A study on the prevalence and associated risk factors for mental health problems among university students in Bangladesh

[বাংলাদেশি বিশ্ববিদ্যালয় পড়ুয়া ছাত্র-ছাত্রীদের উপর মানসিক স্বাস্থ্য এবং তার কারণ নিয়ে একটি গবেষণা]

The survey is designed to assess the mental health of university students in Bangladesh. This research work has received ethical approval from an Institutional Review Board (UAP/REC/2023/201-S). This is a completely anonymous survey where no one will identify you or compromise your privacy requested here. All information collected here only for explaining the various aspects of this study that will be kept confidential. Your consent to participate in this survey is very important. Thank you in advance for your cooperation in this noble initiative.

[এই গবেষণাটি বাংলাদেশের বিশ্ববিদ্যালয় পড়ুয়া ছাত্র-ছাত্রীদের মানসিক স্বাস্থ্য এবং তার কারণ মূল্যায়ন করার জন্য করা হয়েছে। এই গবেষণা কার্যক্রমটি একটি ইনস্টিটিউশনাল রিভিউ বোর্ড (UAP/REC/2023/201-S) থেকে নৈতিক অনুমোদন পেয়েছে। এটি সম্পূর্ণরূপে একটি অজ্ঞাতনামা/নামবিহীন জরিপ যেখানে আপনাকে সনাক্ত করা যাবে না কিংবা আপনার প্রদানকৃত সকল তথ্য শতভাগ গোপন ও সুরক্ষিত থাকবে। আপনার দেওয়া সকল তথ্য শুধুমাত্র গবেষণা কাজে এবং একাডেমিক উদ্দেশ্যে গোপনীয়তা বজায় রেখে ব্যবহার করা হবে। এই গবেষণায় অংশগ্রহণের জন্য সম্মতি খুব গুরুত্বপূর্ণ। এই মহৎ উদ্যোগে আপনার সহযোগিতার জন্য অগ্রিম ধন্যবাদ।]

Express your consent to participate in the research and processing of anonymous data for scientific purposes [এই নামবিহীন/অজ্ঞাতনামা বৈজ্ঞানিক সমীক্ষায় অংশগ্রহণের জন্য সম্মতি প্রকাশ করুন]

*I am a Bangladeshi university student and have no objection to the privacy policy of this survey and the information collected. I voluntarily agree to take part in this study. [আমি একজন বাংলাদেশী বিশ্ববিদ্যালয়ের ছাত্র/ছাত্রী এবং এই সমীক্ষার গোপনীয়তা নীতি এবং সংগৃহীত তথ্য নিয়ে আমার কোন আপত্তি নেই। আমি স্বেচ্ছায় এই গবেষণায় অংশ নিতে সম্মত।]

☐ I do agree (আমি একমত)

☐ I do not agree (আমি একমত নই)

Please tick one box for each statement [প্রতিটি উক্তির জন্য যে উত্তরটি আপনার মতামতকে সবচেয়ে ভালোভাবে বর্ণনা করে তা চিহ্নিত করুন]

Section 01: General Questions (সাধারণ প্রশ্ন)

1. Age in years [বয়স (বছর)]

☐

2. Sex [লিঙ্গ পরিচিতি]

☐ Male (পুরুষ)

☐ Female (মহিলা)

☐ Others (অন্যান্য)

3. Height (Feet and Inch) [উচ্চতা (ফুট এবং ইঞ্চিতে)]

☐

4. Weight (kg) [ওজন (কেজি)]

☐

5. Marital status [বৈবাহিক অবস্থা]

☐ Unmarried (অবিবাহিত)

☐ Married (বিবাহিত)

- o Divorced (ডিভোর্সড)
- 6. Education level [শিক্ষাগত যোগ্যতা]
 - o Undergraduate level (Year:.....) [স্নাতক (বর্ষ)]
 - o Graduate/above level [স্নাতকোত্তর]
- 7. Academic performance [লেখাপড়ায় ফলাফল]
 - o CGPA:..... (সিজিপিএ)
- 8. Family income monthly (KBDT) [পারিবারিক মাসিক আয় (হাজারে)]
 - o
- 9. Family type [পরিবারের ধরণ]
 - o Nuclear family (একক পরিবার)
 - o Joint family (যৌথ পরিবার)
- 10. Parents status [পিতামাতার বর্তমান সম্পর্ক]
 - o Not separated (অবিচ্ছিন্ন)
 - o Separated (বিচ্ছিন্ন)
- 11. Do you have any sibling (s) [আপনার কি ভাইবোন আছে?]
 - o Yes (number.....& your rank.....) [হ্যাঁ (সংখ্যা এবং আপনার ক্রম)]
 - o No (না)
- 12. Are you involved in a relationship? [আপনি কি কোন সম্পর্কে জড়িত আছেন?]
 - o Yes (হ্যাঁ)
 - o No (না)
- 13. Living status [বসবাসের অবস্থা]
 - o With family (পরিবারের সাথে)
 - o Without family (পরিবার ছাড়া)
- 14. Smoking habit [ধূমপানের অভ্যাস]
 - o Non-smoker (অধূমপায়ী)
 - o Current smoker (ধূমপায়ী)
 - o Ex-smoker (আগে ধূমপায়ী ছিলেন)
- 15. Do you have any chronic diseases? [আপনি কি কোন দীর্ঘস্থায়ী রোগে আক্রান্ত?]
 - o Yes (হ্যাঁ)
 - o No (না)
- 16. Residence area [বসবাসের এলাকা]
 - o Urban (শহর)
 - o Rural (গ্রাম)
- 1. Over the last 2 weeks, how often have you been bothered by the time taken to fall asleep after turning off the lights? [ঘুমাতে গিয়েও ঘুম আসছে না অথবা অনেক সময় লাগছে এমনটি আপনার সাথে কতবার হয়েছে বিগত দুই সপ্তাহে?]
 - o Not at all (0) (একেবারেই না)

- o Slightly delayed (1) (সামান্য দেরি)
 - o Markedly delayed (2) (যথেষ্ট দেরি)
 - o Very delayed or did not sleep at all (3) (অতিরিক্ত দেরি/ অনিদ্রা)
2. Over the last 2 weeks, how often have you been bothered by awakenings during the night? [মাঝরাতে হঠাৎ করে ঘুম ভেঙে যাওয়ার মতো অসুবিধা বিগত দুই সপ্তাহে কতবেশি অনুভব করেছেন?]
- o No problem (0) (একবারও হয়নি)
 - o Minor problem (1) (সামান্য পরিমাণ অসুবিধা)
 - o Considerable problem (2) (যথেষ্ট পরিমাণ অসুবিধা)
 - o Serious problem or did not sleep at all (3) (গুরুতর অসুবিধা/অনিদ্রা)
3. Over the last 2 weeks, how often have you experienced final awakening earlier than desired? [সকালে ওঠার যথেষ্ট আগে ঘুম ভেঙে যায় এবং আর ঘুম আসেনা এমন সমস্যা আপনি বিগত দুই সপ্তাহে কতবার অনুভব করেছেন?]
- o Not earlier (0) (একবারও হয়নি)
 - o A little earlier (1) (সামান্য আগে ঘুম ভেঙে যায়)
 - o Markedly earlier (2) (যথেষ্ট আগে ঘুম ভেঙে যায়)
 - o Much earlier or did not sleep at all (3) (অনেক আগে/ অনিদ্রা)
4. Over the last 2 weeks, how long was your total sleep duration? [বিগত দুই সপ্তাহে আপনার সম্পূর্ণ ঘুমের সময়কাল কেমন ছিলো?]
- o Sufficient (0) (পর্যাপ্ত)
 - o Slightly insufficient (1) (কিছুটা অপরিপূর্ণ)
 - o Markedly insufficient (2) (যথেষ্ট অপরিপূর্ণ)
 - o Very insufficient or did not sleep at all (3) (অনেক বেশি অপরিপূর্ণ/ অনিদ্রা)
5. Over the last 2 weeks, how was your experience of the overall quality of sleep (no matter how long you slept)? [বিগত দুই সপ্তাহে আপনার সামগ্রিক ঘুমের কোয়ালিটি কেমন ছিলো (ঘুমের সময়কালের সাথে সম্পর্কহীন)?]
- o Satisfactory (0) (যথেষ্ট ভালো)
 - o Slightly unsatisfactory (1) (সামান্য খারাপ)
 - o Markedly unsatisfactory (2) (যথেষ্ট খারাপ)
 - o Very unsatisfactory or did not sleep at all (3) (অতিরিক্ত খারাপ/ অনিদ্রা)
6. Over the last 2 weeks, have you realized that your sense of well-being is being decreased during the day? [বিগত দুই সপ্তাহ ধরে, আপনার সামগ্রিক ভালো লাগা অথবা ভালো থাকার মতো বিষয়গুলো কি ক্রমশ কমে যাচ্ছে বলে মনে হয়?]
- o Normal (0) (স্বাভাবিক আছে)
 - o Slightly decreased (1) (সামান্য পরিমাণ কমেছে)
 - o Markedly decreased (2) (যথেষ্ট পরিমাণ কমেছে)
 - o Very decreased (3) (অতিরিক্ত পরিমাণ কমেছে/ অনিদ্রা)

7. Over the last 2 weeks, have you realized that your ability to function (physical and mental) during the day has decreased? [বিগত দুই সপ্তাহ ধরে আপনার কি এমন মনে হয় যে, আপনার শারিরীক এবং মানসিক কর্মক্ষমতা কমে গিয়েছে?]
- ☐ Normal (0) (স্বাভাবিক আছে)
 - ☐ Slightly decreased (1) (সামান্য পরিমাণ কমেছে)
 - ☐ Markedly decreased (2) (যথেষ্ট পরিমাণ কমেছে)
 - ☐ Very decreased (3) (অতিরিক্ত পরিমাণ কমেছে/ অনিদ্রা)
8. Over the last 2 weeks, how often have you been bothered by sleepiness during the day? [বিগত দুই সপ্তাহ ধরে আপনার কি এমন মনে হয় যে, দিনের বেলা আপনি ঘুম ঘুম অনুভব করেন?]
- ☐ None (0) (একবারেই না)
 - ☐ Mild (1) (সামান্য পরিমাণ)
 - ☐ Considerable (2) (যথেষ্ট পরিমাণ)
 - ☐ Intense (3) (অতিরিক্ত পরিমাণ)

Any comments [আপনার মতামত]

.....
Thank you for completing this survey [আপনার সহযোগিতার জন্যে অসংখ্য ধন্যবাদ।]

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