



Daffodil
International
University

Project on

**An investigation of rational use of antidepressants in patients of
BSMMU hospitals located in Dhaka, Bangladesh**

[In the partial fulfillment of the requirements for the degree of Bachelor of
Pharmacy]

Submitted To

The Department of Pharmacy,
Faculty of Allied Health Sciences,
Daffodil International University

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APPROVAL

This project paper, “**An investigation of rational use of antidepressants in patients of BSMMU hospitals located in Dhaka, Bangladesh**”, submitted to the Department of Pharmacy, Faculty of Allied Health Sciences, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Pharmacy and approved as to its style and contents.

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DECLARATION

I hereby declare that this project report, “An investigation of rational use of antidepressants in patients of BSMMU hospitals located in Dhaka, Bangladesh”, is done by me under the supervision Dr. Sharifa Sultana Associate Professor and Associate Head, I am declaring that this Project is my original work. I also declare that neither this project nor any part therefore has been submitted elsewhere for the award of Bachelor or any degree.

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Dedication.....

My Parents

**The persons who always encourage me in every sphere
of my life**

Abstract

Medications known as antidepressants are frequently administered to treat depression and associated mood disorders. The purpose of this study is to look into the patients' reasonable usage of antidepressants at the hospitals affiliated with Bangabandhu Sheikh Mujib Medical University (BSMMU) in Dhaka, Bangladesh. Progress a designed questionnaire created on validated scales and existing literature related to rational use of antidepressants. Analyses were conducted on prescription trends, treatment guidelines compliance, patient demographics, clinical features, and co-occurring drugs. Conferring to the assessment, 25% responders came to the hospital suffering from hypertension, 18% suffering from diabetes & 28% people came suffering from depression. The inquiry revealed that 54% of respondents said they had been concerned about anything. Giving permission for this study, the majority of respondents 67% said they didn't get enough sleep. 36% of survey participants said they had felt hopeless, and 33% said they had felt helpless. In response, 28% of respondents said they had used drugs or alcohol. The majority of respondents (91%) said they have taken antidepressants on their own initiative without consulting a doctor. All medications (aside from over-the-counter ones) should be taken as prescribed by a physician. 34% of survey participants said that their doctor had prescribed imipramine to treat their depression. A further 23%, 20%, 12%, and 11% said that the doctor had prescribed Sertraline, Fluoxetine, Escitalopram, and Citalopram, in that order. In response to the study, 31% of participants said they felt nauseous after taking an antidepressant. Additionally, 24%, 21%, and 24% of subjects said they had experienced headaches, vertigo, and extreme sleepiness, respectively. We can infer from this poll that the majority of respondents used antidepressants impulsively and without a doctor's prescription.

Contents

Chapter 1	1
Introduction	1
1.1 Introduction	2
1.2 Multifaceted nature of depression	2
1.3 Biochemical basis of depression.....	4
1.4 The cognitive neuropsychological hypothesis of antidepressant action.....	7
1.5 Pathophysiology of depression.....	9
Chapter 2	11
Literature Review	11
2.1 Rational Use of Antidepressants.....	12
2.2 Rational Drug Use in the Treatment of Depression	12
2.3 Rational use of antidepressants in general medicine	12
Chapter 3	14
Purpose of the study	14
3.1 Aim of the study	15
Chapter 4	16
Methodology	16
4.1 Methodology.....	17
4.2 Data Collection:	17
4.3 Data Variables:	17
4.4 Sample size	17
4.5 Data analysis strategy	18
Chapter 5	19
Result & Discussion	19

5.1 Age of responders	20
5.2 Gender of participants	21
5.3 Profession	22
5.4 Reason for hospital coming	23
5.5 Ratio of depressive disorder affected people.....	24
Q: Do you have suffered depressive disorder?	24
5.6 Sleeping pattern	25
5.7 Feel like hopeless or helpless	26
5.8 Taken alcohol/smoke/drugs	27
5.9 Taken sleeping pill without doctors' advice.....	28
5.10 Medicine did the doctor prescribe	29
5.11 Side effect after taking antidepressant.....	30
Chapter 6	31
Conclusion	31
6.1 Conclusion	32
Chapter 7	29
Reference	29

List of figures

Figure 1: Diagram showing the stages of chemical transfer at a synapse [14].....	5
Figure 2: Schematic presentation of the cognitive neuropsychological model of antidepressant action. [23]	9
Figure 3: Pathophysiology of depression.....	10
Figure 4: Age of responders.....	20
Figure 5: Gender of participants	21
Figure 6: Profession	22
Figure 7: Reason for coming hospital	23
Figure 8: Ratio of depressive disorder affected people	24
Figure 9: Sleeping pattern	25
Figure 10: feel like hopeless or helpless	26
Figure 11: Taken alcohol/smoke/drugs.....	27
Figure 12: Taken antidepressant without doctors' advice	28
Figure 13: Medicine did the doctor prescribe	29
Figure 14: Side effect after taking antidepressant.....	30

Chapter 1

Introduction

1.1 Introduction

Over the past few decades, mental health illnesses have become more commonplace worldwide, and Bangladesh is not a contributor to this growing problem. Antidepressant drugs have become a vital component in the treatment of mental health diseases, including depression, anxiety, and related mood disorders, among other therapeutic methods. The growing need for mental health treatments necessitates a rigorous assessment of the appropriate use of antidepressants, particularly in hospital settings where prescriptions for these drugs are common [1]. Bangladesh's dynamic capital city, Dhaka, is home to a number of hospitals that are essential to providing mental health services to the country's broad and growing populace. Considering the fact that antidepressants are widely used, questions have been raised regarding the propriety and logic of their prescription procedures. This study aims to investigate antidepressant medication prescribing practices, following to standards, and general oversight protocols in many renowned Dhaka hospitals [2]. The comprehension of the appropriate administration of antidepressants necessitates a comprehensive investigation that encompasses multiple facets, including but not limited to diagnostic precision, medication strategizing, therapeutic result tracking, and the incorporation of psychosocial therapies. The purpose of this investigation is to provide light on the current procedures used in the hospitals that have been chosen, pointing out any possible weaknesses, difficulties, and areas where mental health care delivery could be improved [3]. In addition, the study will consider the sociocultural background of Dhaka, recognizing the distinct elements that could impact patient presentations as well as healthcare providers' choices when it comes to prescribing antidepressants. The present study aims to provide significant knowledge that can inform methods based on evidence for maximizing the delivery of mental health care and maintaining the prudent use of antidepressants in this dynamic healthcare surroundings by examining the complexities of antidepressant application in Dhaka's hospital settings [4].

1.2 Multifaceted nature of depression

Millions of individuals globally are impacted by the intricate and multidimensional mental health illness known as depression. It is not a single event, instead encompassing a range of physical, mental, and mental challenges that can differ in severity and length.

Comprehending the complex nature of depression is essential for those battling the illness as well as those attempting to assist them [5].

Emotional Dimensions:

Melancholy and Despair: The omnipresent feelings of melancholy and despair are among the most identifiable characteristics of depression. People may experience intense sadness that lasts for a long time, frequently with no obvious reason.

Psychological Numbness: Ironically, a small percentage of people who suffer from depression may also struggle to feel any emotions at all. This emotional blunting might damage one's capacity for joy and have an effect on interpersonal interactions [6].

Cognitive Aspects:

Negative Thought Patterns: Depression often involves distorted and negative thought patterns. Individuals may engage in self-critical or pessimistic thinking, leading to a cycle of negativity that reinforces the depressive state.

Cognitive Impairment: Depression can affect cognitive functions such as concentration, memory, and decision-making. This cognitive impairment can interfere with daily tasks and contribute to feelings of frustration and helplessness [7].

Behavioral Manifestations:

Social Withdrawal: Many individuals with depression withdraw from social interactions, finding it challenging to engage with others. Social withdrawal can exacerbate feelings of loneliness and isolation.

Changes in Sleep and Appetite: Depression can disrupt sleep patterns, leading to insomnia or oversleeping. Similarly, changes in appetite, resulting in overeating or loss of appetite, are common symptoms [8].

Physical Components:

Fatigue and Low Energy: A pervasive sense of fatigue and low energy is a common physical manifestation of depression. Everyday tasks may feel overwhelming, and motivation to engage in activities can be severely diminished.

Aches and Pains: Some individuals with depression may experience physical symptoms such as headaches, muscle aches, and digestive issues. These symptoms highlight the interconnectedness of mental and physical well-being [9].

Psychosocial Influences:

Environmental Stressors: Depression is often influenced by various psychosocial factors, including life events, trauma, and chronic stress. Understanding and addressing these factors are crucial aspects of a comprehensive approach to managing depression.

Social Stigma and Isolation: The stigma surrounding mental health issues can contribute to feelings of shame and isolation for those experiencing depression. Addressing societal attitudes and fostering empathy are essential steps in supporting individuals with depression [10].

1.3 Biochemical basis of depression

We have intriguing new understandings of the nature of mental processes thanks to the enormous advancements made in the area of neuroscience during the 20th century. Neuroscience, which began with neuroanatomical and electrophysiology at the turn of the 20th century, has evolved into an interdisciplinary field encompassing a wide range of biological examinations, from brain imaging to molecular analyses of cell and gene function. This has increased our understanding of the cellular and molecular mechanisms that control behavior. Numerous Nobel Prize winners, including Julius Axelrod, have made significant contributions to our comprehending of how the brain works. Consequently, investigations into psychiatric illnesses are now entirely based on fundamental neurobiology. There was little information available for a time regarding the biological causes of the disorders, especially in the discipline of psychiatry [11]

Synaptic transmission

One of the largest and most important developments in neuroscience was the discovery by Otto Loewi and colleagues that chemical transmission is the main way that nerves communicate with one another. We now have a good understanding of pre- and postsynaptic events, which are carefully regulated and form the basis for learning and plasticity in the central nervous system. (CNS). Chemical delivery requires several steps,

including neurotransmitter production, secretory vesicle storage, and the controlled discharge of the neurotransmitters into the synaptic cleft between pre- and postsynaptic neurons [12]. Furthermore, the neurotransmitters' effects have to be reversed, and different stages in the signal transduction cascade must be used to trigger the last cellular reactions. In Figure 1, an ordinary neurotransmitter synapse is schematically depicted [13].

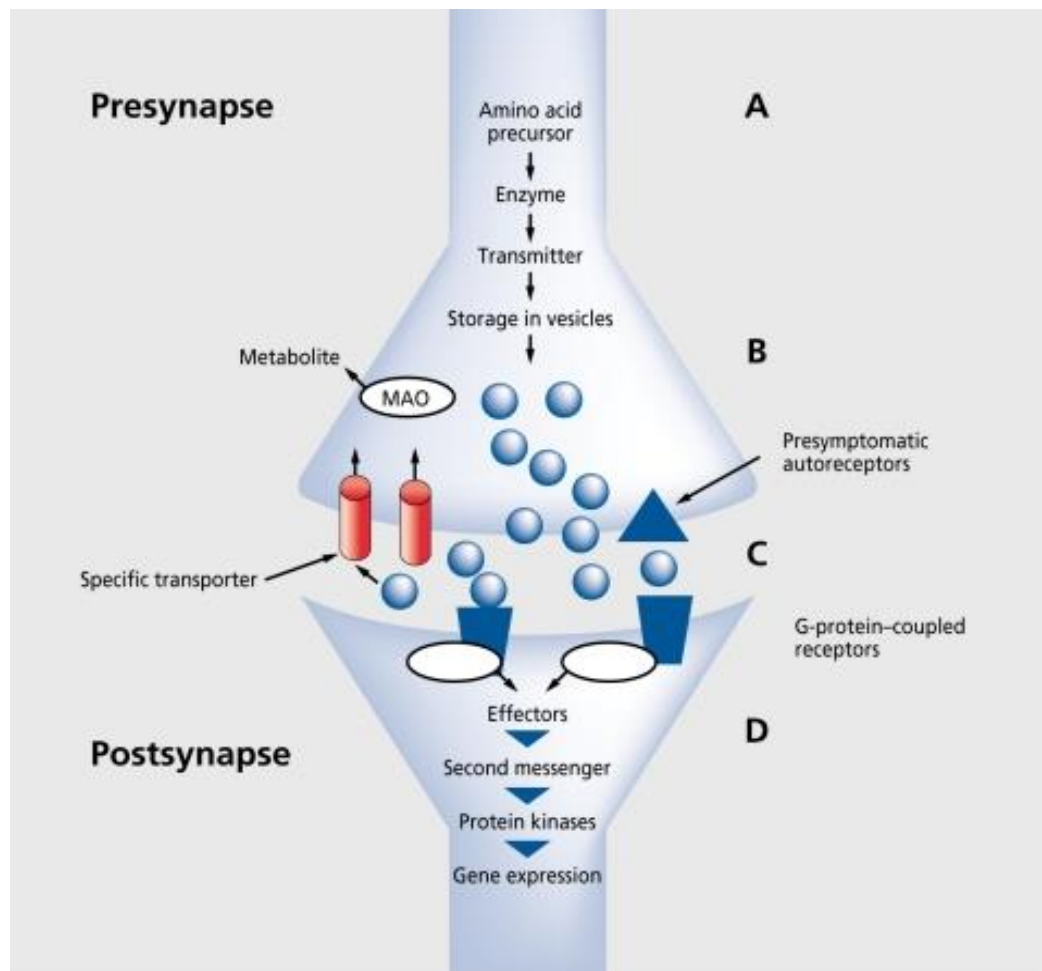


Figure 1: Diagram showing the stages of chemical transfer at a synapse [14]

Notwithstanding their inability to cross the barrier enveloping the neurons, neurotransmitter molecules do initiate a cascade of responses via the receptors in the membrane of the post-synaptic membrane, which are often coupled to guanine nucleotide-binding proteins. (G-proteins). These G-proteins are significant precursor regulatory elements in transmembrane transmission because they affect a variety of intracellular signaling pathways, including phospholipases, adenylylcyclases, and the

phosphoinositide-mediated process [15]. An increase in intracellular calcium concentrations of ions or second messengers including cyclic adenosine monophosphate (cAMP) are examples of early cellular events in the signal transduction waterfall that set off a pathway via the phosphorylation of protein kinases. This process regulates a variety of physiological replies and controls both short- and long-term neurological processes by regulating neuronal ion channels, receptor modulation, and neurotransmitter release [16].

Name of drug	Mechanism of action	Example
Selective serotonin reuptake inhibitors (SSRIs).	SSRIs work by preventing serotonin from being reabsorbed, which raises serotonin levels. SSRIs, in contrast to other antidepressant groups, mostly spare other neurotransmitters including dopamine and norepinephrine.	Fluoxetine, paroxetine, citalopram, Escitalopram.
Serotonin and norepinephrine reuptake inhibitors (SNRIs).	Serotonin-norepinephrine reuptake inhibitors (SNRIs) prolong the impact of monoamines in the synaptic cleft of the central nervous system by inhibiting the presynaptic neuronal absorption of serotonin and norepinephrine. This results in higher postsynaptic stimulation of receptors and neuronal operations.	Desvenlafaxine, levomilnacipran
Atypical antidepressants.	In order to alleviate depression, atypical antidepressants eventually change brain chemistry and interaction in the brain nerve cell circuitry that controls mood.	Vortioxetine, mirtazapine
Tricyclic antidepressants.	They raise the concentration of these neurotransmitters in the synaptic cleft by preventing serotonin and norepinephrine from being reabsorbed in presynaptic terminals. Serotonin and norepinephrine concentrations that are higher at the synapses probably contribute to their anti-depressive effects.	imipramine, nortriptyline, amitriptyline, desipramine

Monoamine oxidase inhibitors (MAOIs).	The neurotransmitters dopamine, serotonin, and norepinephrine are eliminated from the brain by an enzyme known as monoamine oxidase. This is prevented by MAOIs, which increases the amount of these brain chemicals accessible to modify depression-affected cells and circuits.	Tranylcypromine, phenelzine and isocarboxazid
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Table 1: Classification of antidepressant drug [17]

1.4 The cognitive neuropsychological hypothesis of antidepressant action

The effect of antidepressant drugs on cognitive functions, specifically how they affect how people absorb knowledge, experience emotions, and do cognitive tasks, is the subject of the cognitive neuropsychological hypothesis of antidepressant action. This theory is based on the notion that depression entails cognitive dysfunctions in addition to affective and mood disorders. It is thought that antidepressants work therapeutically by influencing certain cognitive processes [18]. These are the main points of this theory:

1. Neurotransmitter Regulation:

- Antidepressants, such as selective serotonin reuptake inhibitors (SSRIs) and serotonin-norepinephrine reuptake inhibitors (SNRIs), primarily target neurotransmitters like serotonin and norepinephrine. These neurotransmitters play a crucial role in mood regulation and are thought to impact cognitive processes.

2. Enhancement of Neuroplasticity:

- Antidepressants are believed to enhance neuroplasticity, the brain's ability to reorganize itself by forming new neural connections. This process is essential for learning, memory, and adaptive responses to stress. By promoting neuroplasticity, antidepressants may help reshape maladaptive cognitive patterns associated with depression [19].

3. Improvement in Cognitive Biases:

- Depression often involves negative cognitive biases, such as selective attention to negative stimuli, overgeneralization of negative experiences, and a tendency to

interpret ambiguous information negatively. Antidepressants may mitigate these biases, allowing individuals to perceive and interpret information more objectively.

4. Effects on Executive Functions:

- Executive functions, including cognitive processes like working memory, cognitive flexibility, and inhibitory control, are often impaired in individuals with depression. Some antidepressants may positively influence these executive functions, leading to improvements in decision-making, problem-solving, and emotional regulation [20].

5. Neurogenesis in the Hippocampus:

- Chronic stress, a common factor in depression, has been associated with reduced neurogenesis (formation of new neurons) in the hippocampus. Antidepressants may reverse this effect, promoting neurogenesis in the hippocampus. This structural change is thought to contribute to the cognitive improvements associated with antidepressant treatment.

6. Modulation of Inflammatory Responses:

- There is evidence linking depression to inflammation, and some antidepressants have anti-inflammatory effects. By modulating inflammatory responses, these medications may indirectly impact cognitive functions, as inflammation has been implicated in cognitive impairments [21].

7. Time Course of Cognitive Changes:

- The cognitive neuropsychological hypothesis suggests that improvements in mood may precede significant changes in cognitive functioning. This delayed onset of cognitive improvements aligns with the observed time lag between the initiation of antidepressant treatment and the onset of therapeutic effects.

It's crucial to remember that depression is a complex illness with multiple contributing variables to both its genesis and reaction to medication, even while the cognitive neuropsychological theory offers insightful information on the mechanisms of antidepressant action. The intricate relationship among mental health and pharmacological therapies in the setting of depression is highlighted by the interaction among neurotransmitter regulation, neuroplasticity, and cognitive abilities [22].

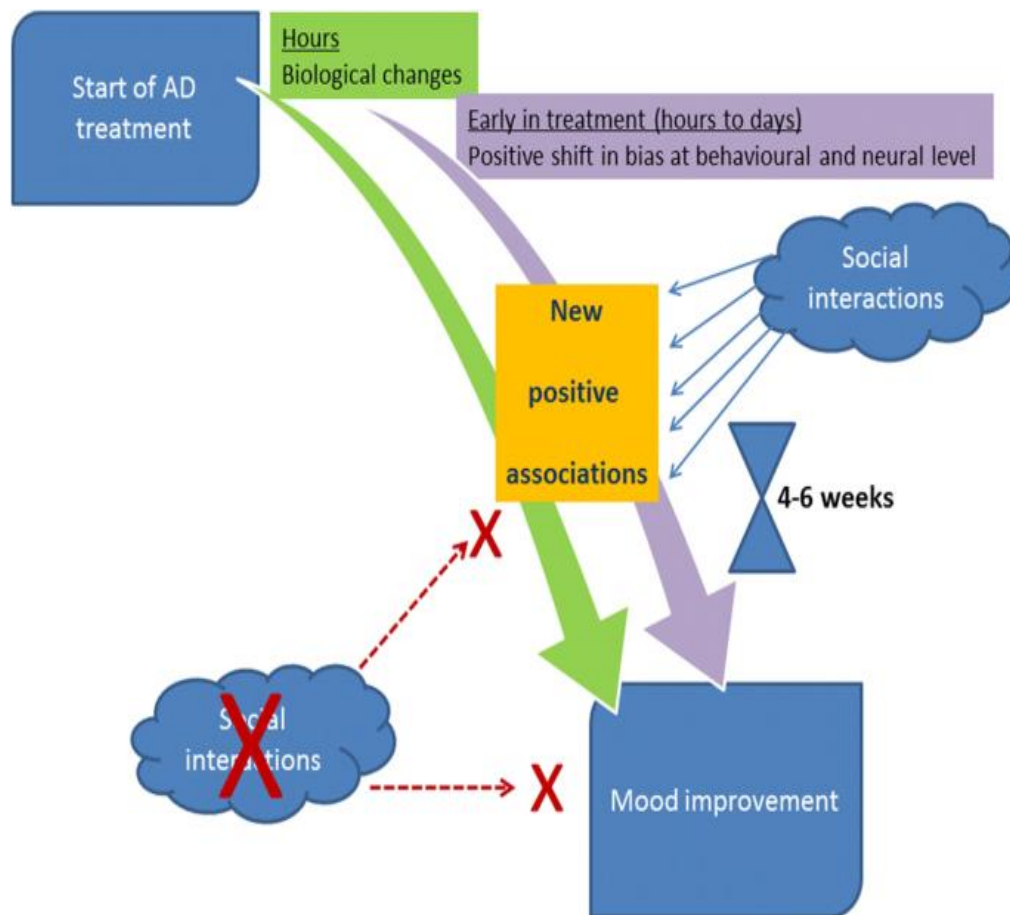


Figure 2: Schematic presentation of the cognitive neuropsychological model of antidepressant action. [23]

1.5 Pathophysiology of depression

Throughout the span of a lifetime, there are no useful imaging anomalies or signs to pinpoint the pathophysiology of melancholy. The post-mortem examination revealed no persistent anatomical or neurochemical abnormalities in the brain. The great majority of medications currently available were discovered through empirical research. The majority of modern hypotheses are built upon the "amine hypothesis". Mood conditions are mostly thought to be caused by changes in biogenic amine concentrations. [19] This suggests that mania results from an operational excess of catecholamine's at the major synapses in the brain, whereas sadness results from a practical deficiency of catecholamine's, particularly norepinephrine (NE) [24].

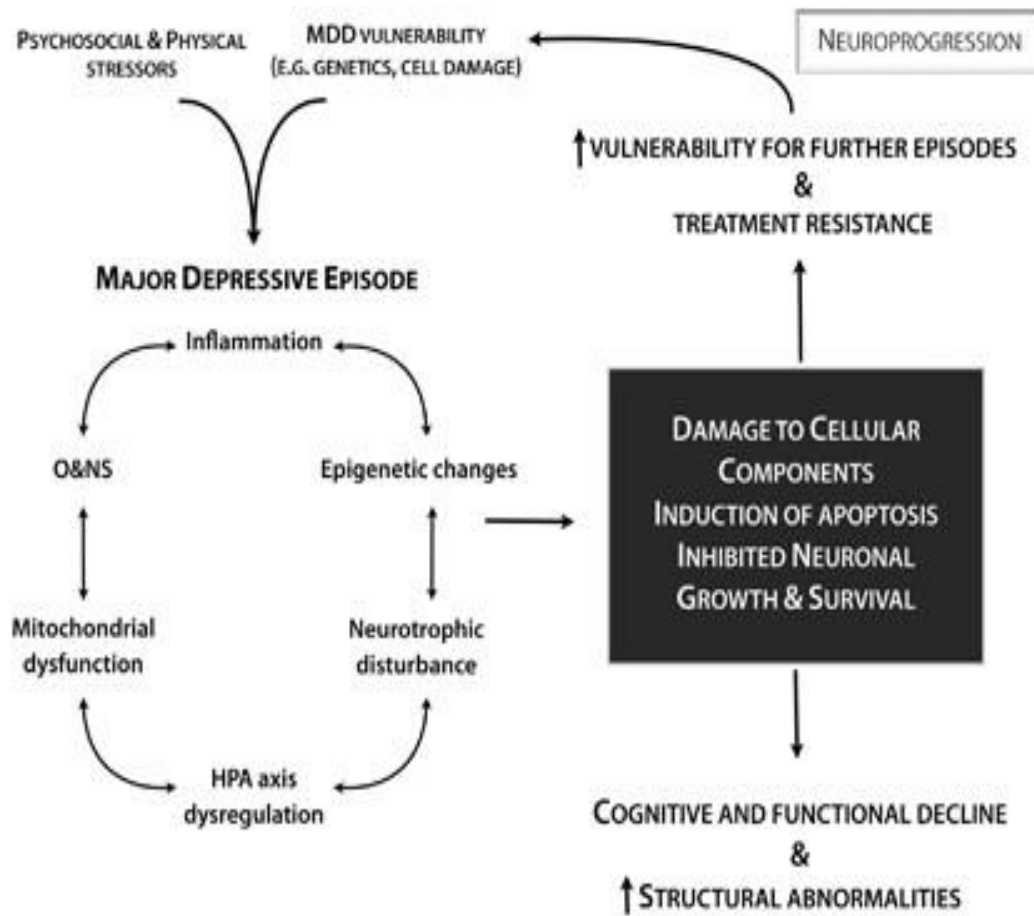


Figure 3: Pathophysiology of depression

Chapter 2

Literature Review

2.1 Rational Use of Antidepressants

Accurately diagnosing the type of depression is crucial for successful management of emotional disease. Therefore, electroconvulsive therapy is advised for severe bouts of depression with psychotic symptoms, monoamine oxidase inhibitors are advised for dysthymic disorder and atypical episodes of depression, and tricyclic antidepressants are recommended for major depressive episodes. Patients who do not tolerate treatment are given ECT or lithium augmentation of TCA treatment. When second-generation antidepressants' adverse effect characteristics provide a patient with significant advantages over TCAs, it is advised to use them. To stop recurring depressive episodes, continuous antidepressant therapy could be required [22].

2.2 Rational Drug Use in the Treatment of Depression

As the prevalence and disability of depression become more well recognized, as does the need for treatments with better side consequence characteristics, new medications are being produced to treat the condition. When it comes to managing simple unipolar depression without psychotic symptoms, all antidepressants work equally well. Monoamine oxidase inhibitors are the first line of treatment for patients with atypical depression who exhibit noticeable anxiety, agitation, insomnia, and irritability. There is growing evidence that some depression subtypes respond well to selective serotonin reuptake inhibitors (SSRIs). The range of adverse reactions, long-term tolerability, dosage schedule, clinically relevant drug interactions, preexisting medical disorders, early responsiveness to treatment, and pharmaceutical economics are all important factors to take into account when selecting an antidepressant. It is recommended that an SSRI trial be tried first, taking into account these requirements. The more recent drugs venlafaxine and nefazodone have different modes of action from tricyclic antidepressants and monoamine oxidase inhibitors. A complete remission is more probable to be achieved and maintained if a medication is handy, successful, and tolerable. It will also lessen this very manageable disease's morbidity and death variants [23].

2.3 Rational use of antidepressants in general medicine

One of the most prominent and recurrent causes of morbidity is depression. Thus, in along with curing depressive episodes, psychotherapy needs to increasingly focus on preventing

recurrence Antidepressant medication must therefore be taken for an extended period of time; consequently, general practitioners are becoming more wary about prescribing such treatments. The pharmacological class of a drug and its side-effect profiles play a major role in the selection of an antidepressant. Thankfully, modern medications such as reversible monoamine inhibitors (MAOIs) and selective serotonin reuptake inhibitors (SSRIs) have a far greater security index than tricyclic's and traditional MAOIs [24].

Chapter 3

Purpose of the study

3.1 Aim of the study

This study's main goal is to investigate and assess antidepressant use at different hospitals located in Dhaka, Bangladesh, in a thorough and objective manner. The primary objective of the study is to improve the standard of mental health services provided in the area by providing insight into different aspects of antidepressant prescription, management, and surveillance procedures.

- Investigating the prevalent patterns of antidepressant prescriptions in terms of types, dosages, and duration among healthcare professionals within the selected hospitals.
- Identifying the factors influencing prescribing decisions, such as patient demographics, comorbidities, and adherence to clinical guidelines.
- Investigating the impact of antidepressant therapy on patient outcomes, including treatment efficacy, tolerability, and the occurrence of adverse effects.
- Assessing patient satisfaction and compliance with prescribed antidepressant regimens.
- Evaluating the monitoring and follow-up practices associated with antidepressant therapy, including regular assessments of treatment response, side effects, and adjustments to medication plans.
- Identifying challenges faced by healthcare professionals in the rational use of antidepressants, including issues related to drug availability, affordability, and awareness.
- Identifying opportunities for improvement in the form of educational interventions, policy changes, or resource allocation.
- Recommending evidence-based policies and interventions that can contribute to the rational use of antidepressants in Dhaka hospitals.

Chapter 4

Methodology

4.1 Methodology

- To collect information from an accurate representation of the people in patients of BSMMU, Bangladesh.
- I began working on this survey in December of 2023.

4.2 Data Collection:

- Progress a designed questionnaire created on validated scales and existing literature related to rational use of antidepressants.
- Make the questionnaire understandable to the local populace by translating it into Bengali. Educate a group of data collectors on the questionnaire and moral issues.
- Conduct face-to-face interviews, phone interviews, or online surveys, depending on the accessibility of the respondents. Ensure informed consent and data confidentiality.
- Some important data has been collected by reviewed number of related article paper from different website like Google scholar, research gate and PubMed.

4.3 Data Variables:

- Collect demographic information, including age, gender, educational background, occupation, and residence.
- Gather information associated to rational use of antidepressants, such as the presence of symptoms, family history, triggers, severity, and healthcare utilization.
- Explore lifestyle factors, including smoking habits, dietary patterns, and physical activity.
- Assess environmental factors, such as air quality, housing conditions, and proximity to potential allergens.

4.4 Sample size

- The test had 11 short-answer questions and took roughly four to five minutes to finish.
- I have tried my best to collect all data from dissimilar profession people for gathering dissimilar types of material.

- The inspection is led by a questionnaires oriented survey, around 200 populations was being responded for this assessments.

4.5 Data analysis strategy

The systematic application of logical and/or statistical tools for characterizing and illuminating, compressing and analyzing, and assessing data is known as data analysis. Utilize suitable statistical software (MS word, MS excel) to examine the gathered information. Utilize descriptive statistics to provide an overview of the population and frequency data.

Chapter 5

Result & Discussion

In this chapter represent result of survey data and also presented discussion on provided data.

5.1 Age of responders

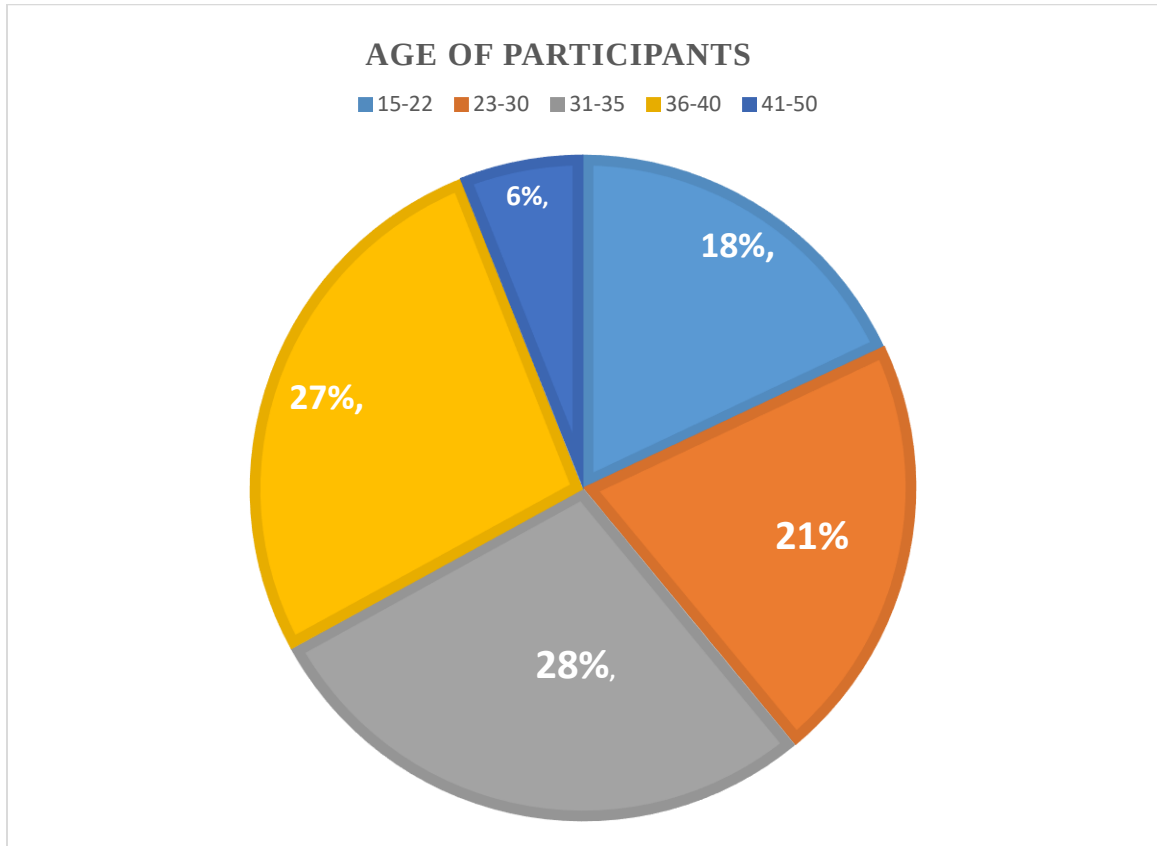


Figure 4: Age of responders

People in a wide range of age groups have responded to this research. The age ranges between 31 and 35 accounted for the largest percentage of participation (28%), followed by 36–40 (27%). 18% of those who took part were in the 15–22 age range. 6% of those who took part were in the 41–50 age range.

5.2 Gender of participants

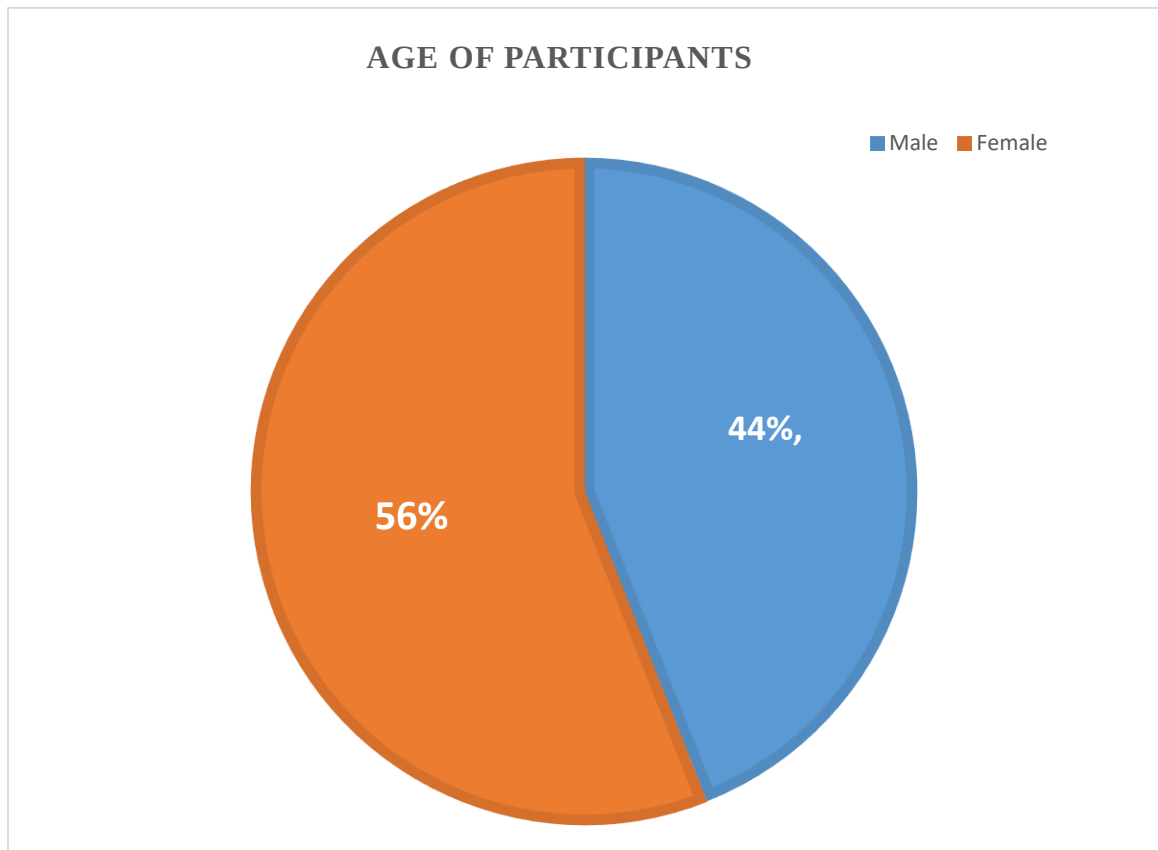


Figure 5: Gender of participants

Figure 5 displays a demographic overview of the people who responded. Putting together the majority 56% of respondents are Female and 44% of respondents are Male.

5.3 Profession

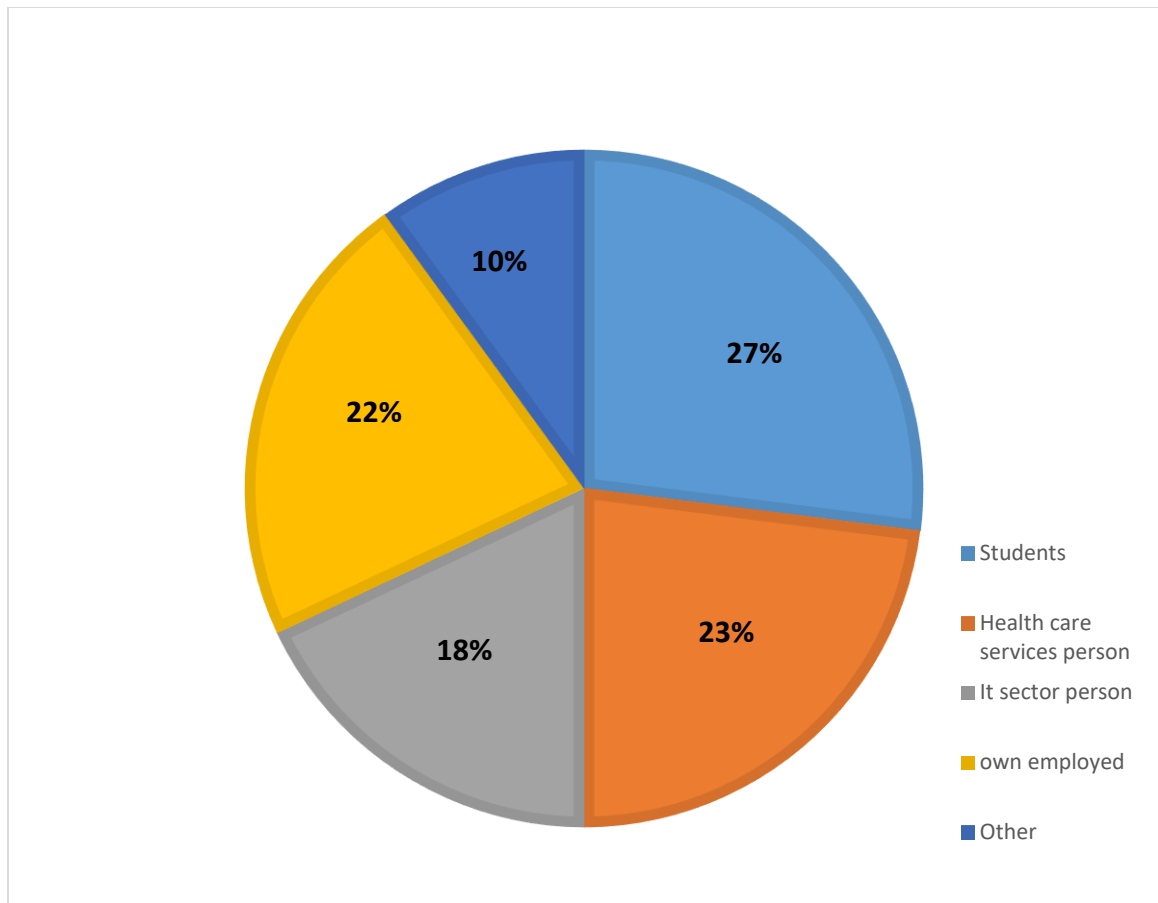


Figure 6: Profession

As can be seen from this point, students made up the majority of contributors (27%). Of the participants, 22% were own employed, 23% were health care service provider, and 18% had it sector person.

5.4 Reason for hospital coming

Q: Why did you come to the hospital?

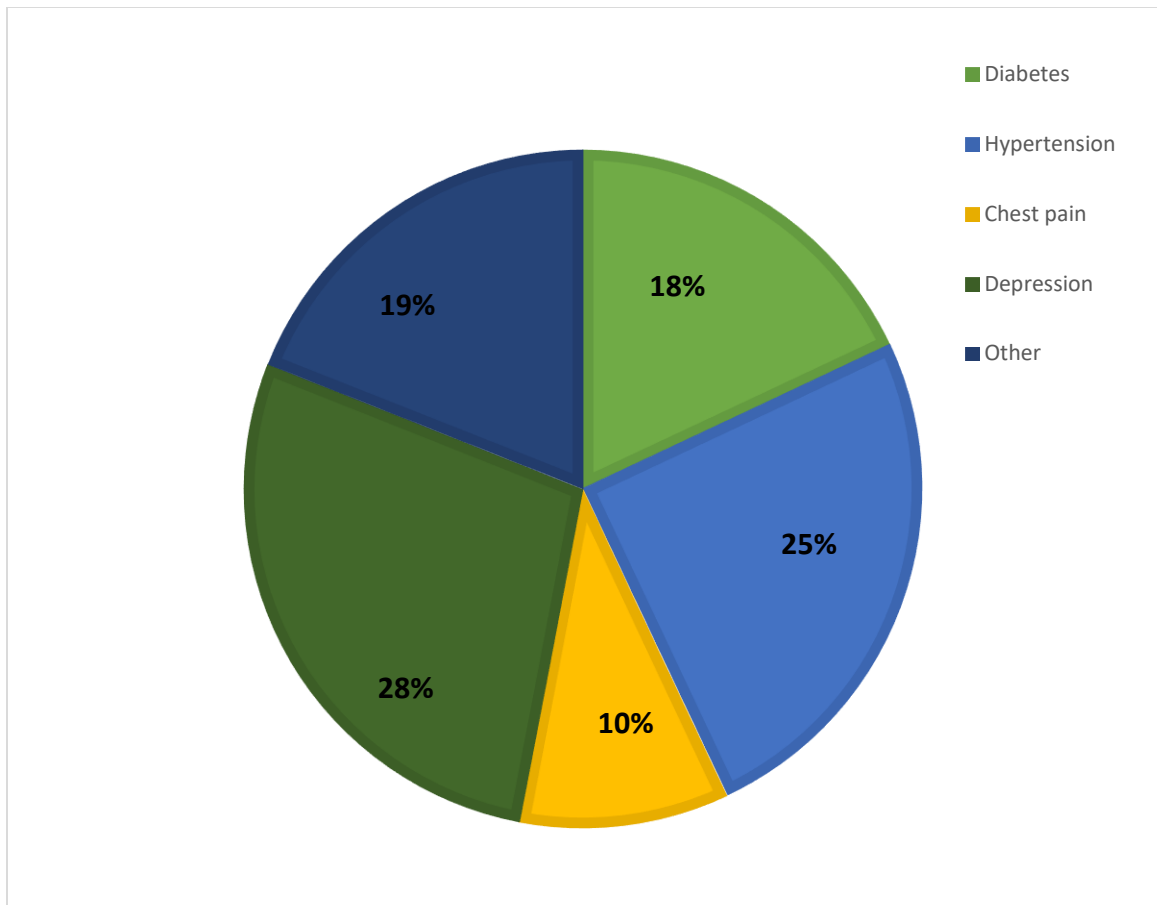


Figure 7: Reason for coming hospital

The study found that 25% of respondents said they had visited the hospital with hypertension, 18% countered that they had visited the hospital with diabetes, and 28% of the respondents said they had visited the hospital with depression.

5.5 Ratio of depressive disorder affected people

Q: Do you have suffered depressive disorder?

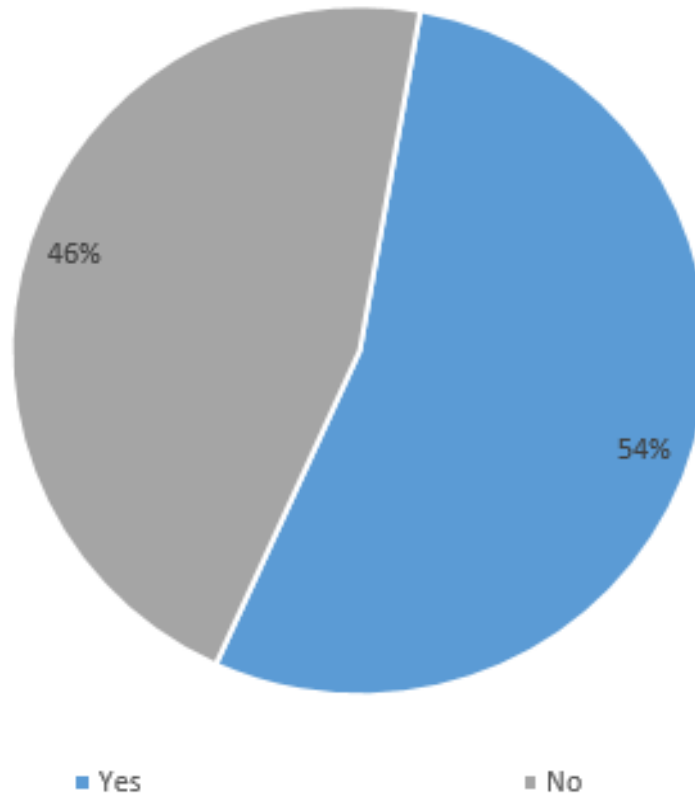


Figure 8: Ratio of depressive disorder affected people

Major depressive disorder, which is sometimes referred to as depression, is a dangerous illness that typically has an impact on a person's emotions, ideas, and actions. The inquiry revealed that 54% of respondents said they had been concerned about anything.

5.6 Sleeping pattern

Q: How long you sleep on a day?

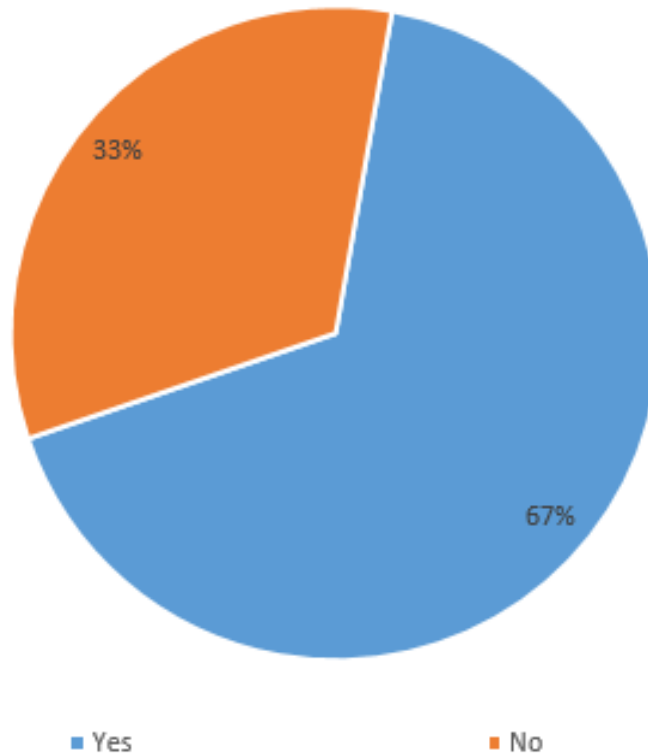


Figure 9: Sleeping pattern

Mental health and sleep quality are intimately associated. Mental health conditions can affect the quality of your sleep, and poor sleep can negatively impact your mental health. Poor sleep leads to worrying. Worrying leads to restless nights. Giving permission for this study, the majority of respondents 67% said they didn't get enough sleep.

5.7 Feel like hopeless or helpless

Q: Do you feel powerless or despairing right now?

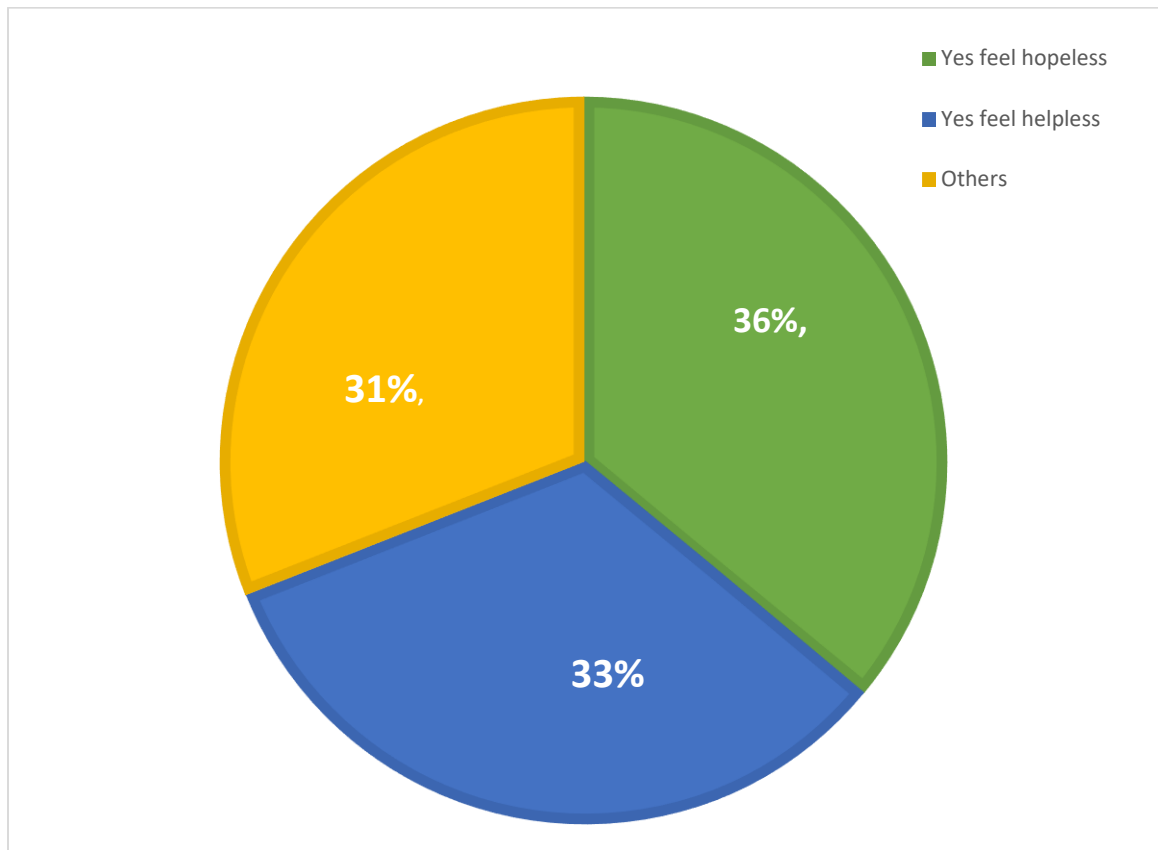


Figure 10: feel like hopeless or helpless

36% of survey participants said they had felt hopeless, and 33% said they had felt helpless. One of the main signs of depression is feeling helpless or hopeless.

5.8 Taken alcohol/smoke/drugs

Q: Do you take alcohol/smoke/drugs?

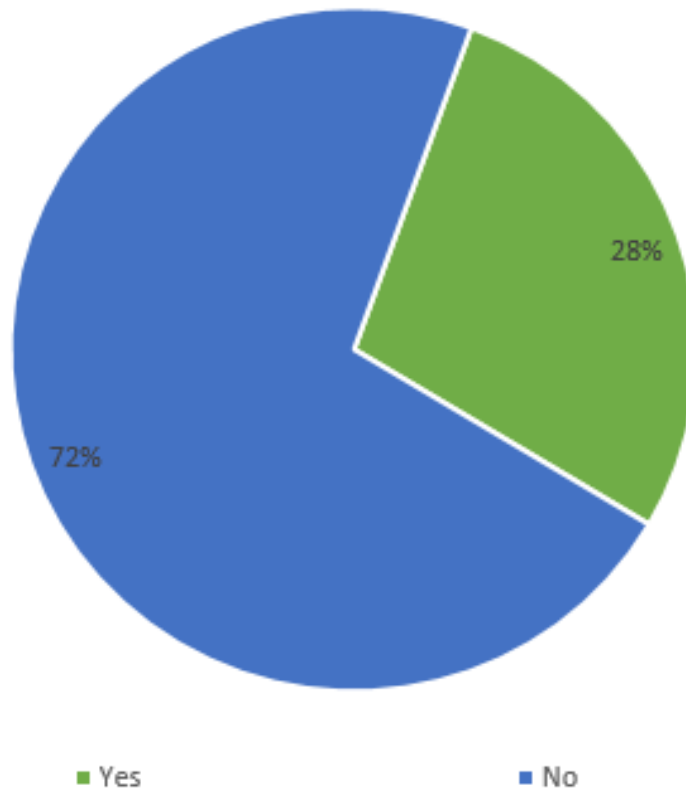


Figure 11: Taken alcohol/smoke/drugs

Alcohol and other drugs can exacerbate feelings of anxiety and hopelessness. Extreme withdrawal from alcohol and long-term alcohol usage problems often increase anxiety levels. Anxiety and sadness have also been related to long-term use or withdrawal from a variety of substances, including alcohol, cannabis, opioids, club drugs, stimulant prescriptions, and cannabis. The analysis revealed that 28% of respondents admitted to using medication or alcohol.

5.9 Taken sleeping pill without doctors' advice

Q: Have you taken sleeping pill without doctors' advice?

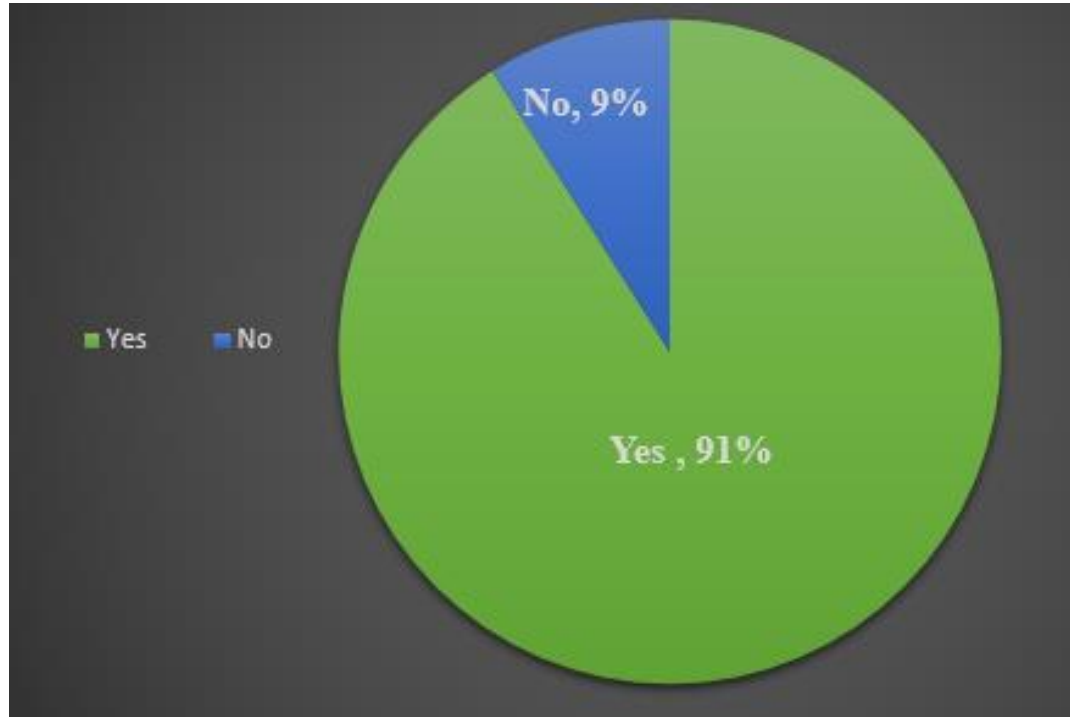


Figure 12: Taken antidepressant without doctors' advice

Antidepressants are a family of medications used to treat clinical depression. They can also be used for managing a range of other conditions, including obsessive compulsive disorder (OCD) and generalized anxiety disorder. Post-traumatic stress disorder, or PTSD. The majority of respondents (91%) said they have taken antidepressants on their own initiative without consulting a doctor. All medications (aside from over-the-counter ones) deserve to be taken as prescribed by a physician.

5.10 Medicine did the doctor prescribe

Q: What kind of medicine did the doctor prescribe?

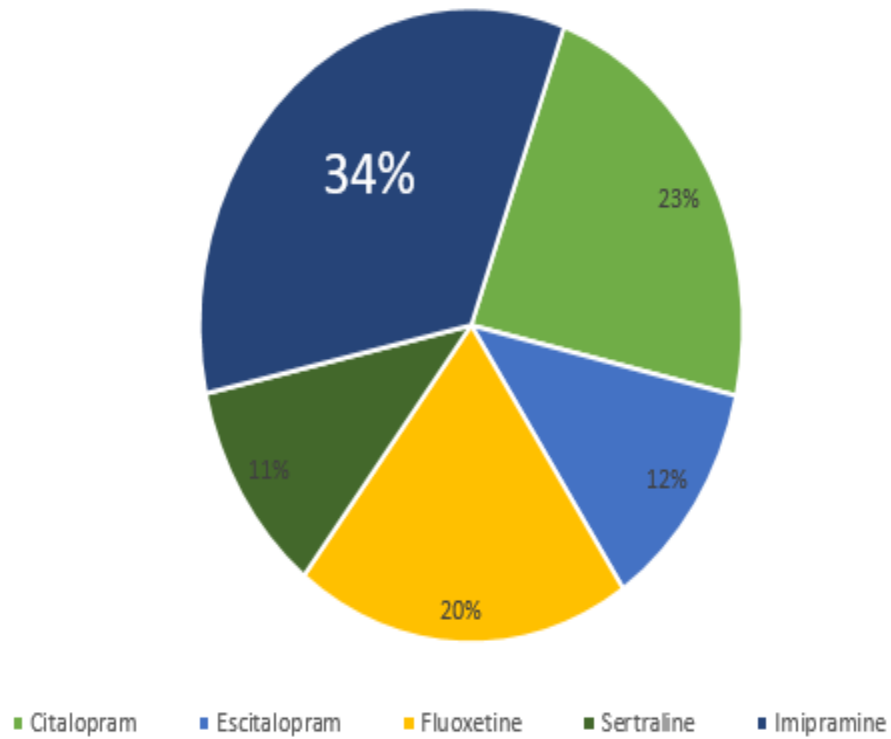


Figure 13: Medicine did the doctor prescribe

34% of survey participants said that their doctor had prescribed imipramine to treat their depression. Also, 23%, 20%, 12%, and 11% of respondents said that their doctor had prescribed Sertraline, Fluoxetine, Escitalopram, and Citalopram, in that order.

5.11 Side effect after taking antidepressant

Q: Which type of side effect have you been felt after taking antidepressant?

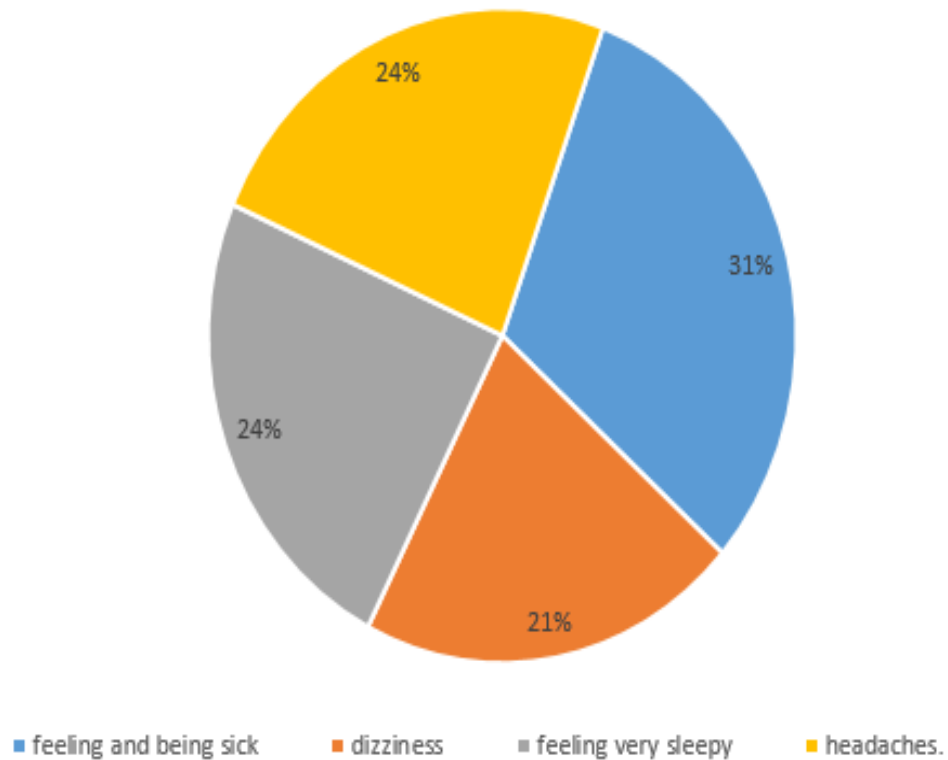


Figure 14: Side effect after taking antidepressant

In response to the study, 31% of participants said they felt nauseous after taking an antidepressant. Additionally, 24%, 21%, and 24% of subjects said they had experienced headaches, vertigo, and extreme sleepiness, accordingly.

Chapter 6

Conclusion

6.1 Conclusion

In summary, this study clarifies how patients at Bangladesh's BSMMU hospitals in Dhaka utilize antidepressants in a reasonable manner. The results highlight the value of a thorough strategy for administering and controlling antidepressant drugs. Antidepressants are clearly helpful in managing mental health issues, but their use needs to be informed by evidence-based procedures that take into account patient history, accurate diagnosis, significant adverse effects, and adherence to the suggested therapies. Conferring to the exploration, 54% responders retorted that they have been troubled about something. Conferring to the investigation, 36% responders retorted that they have been felt hopeless, 33% have been felt helpless. Feeling hopeless/helpless is the primary symptoms of depression. Lithium carbonate double-blind studies and five more medications that were not being actively marketed as antidepressants in the United States at the time were also included. In 61 of 93 group comparisons, the results revealed tricyclic antidepressants to be considerably more efficacious than a placebo. 54% responders replied that they have been worried about something. According to the survey, 31% participants replied that they have been felt feeling sick after taking antidepressant. Also 24%, 21%, 24% participants replied that they have been respectively felt Headaches, Dizziness & Feeling very sleepy. In this survey, we can say that most of the people have been used irrationally antidepressant & they also have been taken antidepressant without prescriber advice.

Chapter 7

Reference

Reference

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