

A Study on the Prevalence and Associated Risk Factors for Depression Among Geriatric Population in Bangladesh

By

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A thesis submitted to the School of Pharmacy in partial fulfillment of the requirements for
the degree of Bachelor of Pharmacy (B.Pharm.)

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Declaration

It is hereby declared that

1. The thesis submitted is my own original work while completing 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 referencing.
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.

Student's Full Name & Signature:

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Approval

The project titled “A study on the prevalence and associated risk factors for Depression among geriatric population in Bangladesh” submitted by Zarin Tasnim (20346048) of Summer, 2024 has been accepted as satisfactory in partial fulfillment of the requirement for the degree of Bachelor of Pharmacy.

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Ethics Statement

The Committee for Ethical Compliance in Research of Southeast University, Dhaka, Bangladesh (Ref: SEU/Pharm/CECR//021/2024) approved the research protocol. All participants were informed about of the study's objectives and their written approval was obtained prior to their participation.

Abstract

Mental health is an important component which includes overall well-being, encompassing emotional, psychological, and social variables that impact individuals' thoughts, feelings, and behaviors in day-to-day life. Various surveys show that a good number of adult populations in Bangladesh is suffering from various kinds of mental health conditions. But the most concerning thing is that people with mental disorders are mostly left untreated, and this led to various kinds of physical health-related problems. In Bangladesh, the mental health of the elderly is an urgent need, particularly in regard to the country's rapidly aging population and the high incidence of mental health disorders within this age range. Depression in Bangladesh's geriatric population is a serious yet sometimes underestimated problem. A diversified strategy is required for combating depression in Bangladesh's elderly population. Now it is necessary to increase the availability of mental health interventions in primary healthcare.

Keywords: Mental health; Geriatric population; Depression; Interventions; Diversified; Combating.

Dedication

To my devoted father and mother, whose guidance and sacrifices act as the backbone of all of my accomplishments, I dedicate this to you.

Acknowledgement

Firstly, I dedicate a debt of appreciation to Dr. Md. Rabiul Islam for his counsel. Secondly, I would like to give my sincere gratitude to BRAC University and the School of Pharmacy for their enormous assistance. Dr. Md. Rabiul Islam has been extremely helpful, providing consistent guidance throughout every stage of the project. I acquired knowledge on how to interact with individuals during data gathering and transform that data into a fruitful project. I am looking forward to applying these experiences in the future.

Table of Contents

Declaration.....	ii
Approval	iii
Ethics Statement.....	iv
Abstract.....	v
Dedication	vi
Acknowledgement	vii
Table of Contents.....	viii-ix
List of Tables.....	x
List of Figures.....	xi
List of Acronyms	xiii
Glossary	xiii
Chapter 1 Introduction.....	1
1.1 Background Information.....	1
1.2 Research Problem Statement	2
1.3 Project Objectives.....	2
1.4 Rationale.....	3
1.5 Associated Risk Factors.....	3-4
1.6 Prevalence and Effects.....	5
1.7 Project Outline.....	6

Chapter 2 Review of Literature.....	7-8
Chapter 3 Methodology.....	9
3.1 Research Design.....	9-10
3.2 Detailed Questionnaire.....	10
3.2.1 Patient Health Questionnaire.....	10-12
3.3 Data Collections.....	12-13
3.4 Data Analysis Method.....	13
3.5 Limitations.....	13
Chapter 4 Result.....	14
4.1 Frequency in Symptomatic and and Non-symptomatic Depressive Groups.....	14-15
4.2 Results of Pearson Correlation Coefficient.....	16
4.3 Chi-square test.....	17
4.4 Independent Sample T-test.....	17-18
4.5 Analysis of Different Demographic Information Gathered for the Research...	18-20
Chapter 5 Discussion.....	21-24
Chapter 6 Conclusion.....	25
References.....	26-27
Appendix A.....	28-32

List of Tables

Table 1: Patient Health Questionnaire-9 scale.....	11
Table 2: Classification of depression based on PHQ-9 score.....	12
Table 3: Comparison between age ranges with depressive groups.....	14
Table 4: Comparison between sex-according to area with depressive groups.....	15
Table 5: Pearson correlation value and significance (p value).....	16
Table 6: Chi-square value.....	17
Table 7: Independent sample T-test value.....	17

List of Figures

Figure 1: Graphical representation of participants' affected with depression of various levels..	18
Figure 2: Graphical representation of participants having chronic disease.....	18
Figure 3: Graphical representation of marital status of participants	19
Figure 4: Graphical representation of sex differentiations.....	19
Figure 5: Graphical representation of participants' living area	19
Figure 6: Graphical representation of participants' smoking habit.....	20
Figure 7: Graphical representation of participants' profession	20
Figure 8: Graphical representation of family type of participants.....	20

List of Acronyms

PHQ	Patient Health Questionnaire
GD	Geriatric Depression
WHO	World Health Organization
BMI	Body Mass Index
IBM	International Business Machines
SPSS	Statistical Package for Social Sciences
COVID-19	Coronavirus Disease 2019
DSM	Diagnostic and Statistical Manual of Mental Disorders

Glossary

Geriatric depression: Geriatric depression usually refers depression in older adults that involves sadness, loneliness, lack of sleep, losing appetite, facing difficulties to concentrate and losing interest in activities.

PHQ scale: The Patient Health Questionnaire is a diagnostic tool that used to examine mental health disorders. It is a self-report screening process containing nine questions that evaluates the existence and severity of depression levels.

Chapter 1

Introduction

1.1 Background Information

There is a widely recognized statement that is often used to address mental health awareness: “Your mental health is just as important as your physical health.” In this quote, it is very clear that there is a strong correlation between mental health and physical health. Our physical health is always influenced by our mental health, whether it could be a bad influence or good. Just as good mental health boosts physical well-being, poor mental health increases various kinds of diseases, especially chronic ones such as diabetes, high blood pressure, asthma, cardiovascular disease, and even cancer. According to a study by *The Business Standard*, more than 18% of the adult population in Bangladesh is suffering from various kinds of mental health problems. The most alarming issue is that 80% of those affected are not receiving any treatment. Mental health of elderly people in Bangladesh is becoming an escalating concern day by day because of country’s rapidly aging population and various challenges that are associated. *The Daily Star* says that 9.4 percent of the total population in Bangladesh are geriatric people, which means almost 16.17 million people are elderly people. Geriatric people of Bangladesh face not only physical difficulties, but also mental health related issues. In 2020, the World Health Organization (WHO) declared that depression was considered to be the second most serious health condition after ischemic heart disease (WHO) (Kessler and Bromet, 2013). The physical health of elderly people in Bangladesh is a significant concern, as the majority of them are experiencing different kinds of health issues. And one of the most important reasons behind their health condition is their mental health.

1.2 Research Problem Statement

As our loved ones age day by day, they become more prone to chronic health problems. They continuously deal with pain, sickness, or disability, which can eventually lead to the cause of their depression, frustration, anxiety, helplessness, and sometimes even loss of independence. People tend to emphasize more on the physical health of geriatric people, often undervalue their mental health. As physical health can negatively impact mental health, and vice versa. Which means taking care of mental health is as important as physical well-being. Finding out the condition of mental health and giving treatment according to it makes it easier to solve various physical health problems. Most of the people of our country do not know they have issues associated with mental health. Discovering the problem with proper medical references and giving suggestions based on the result is the purpose of this project.

1.3 Project Objectives

The principal goal of this project is determining depression among geriatric people in Bangladesh to improve their mental health and entire physical well-being by assessing, identifying, and addressing those factors that lead to depression. In general, geriatric depression (GD) affects people aged 60 years or older; it is also termed late-life depression (Grover et al., 2019; Van Damme et al., 2018). The number of elderly people in Bangladesh is increasing day by day. A study indicates that Bangladeshi geriatric people who are over 60 had 2.79 times higher risk of depression than the middle-aged (aged 40-59) (Das et al., 2014). It has become necessary to solve their mental health-related problems in order to keep them physically healthy. Finding out any issue relating to depression by using the Patient Health Questionnaire (PHQ) test and correlating the result with socio-demographic data is the primary goal of this project.

1.4 Rationale

Depression is complexly interlinked to various kinds of pathological conditions that involve biological, psychological, and social mechanisms. Depression induces the level of pro-inflammatory cytokines (e.g., IL-6, TNF- α), various stress hormones such as cortisol that contribute to systemic inflammation (Davis, 2023). Such inflammation increases the risk of some serious health conditions such as cardiovascular diseases, high cholesterol, hypertension, autoimmune disorders, and so on. Furthermore, depression not only creates disturbance in insulin sensitivity and glucose metabolism, increasing the risk of type 2 diabetes, but it can also lead to insulin resistance, which worsens depressive symptoms. The relationship between chronic pain and depression is bidirectional; pain worsens mood, and depression lowers pain tolerance. It deteriorates an individual's back pain and osteoarthritis (Frank et al., 2023). Depression increases the probability of consuming alcohol and nicotine by 40%, which can lead to various health-related issues (Coryell, 2023). Moreover, depression induces hospitalization possibility for endocrine disorders and musculoskeletal diseases such as carpal tunnel syndrome, back pain, tennis elbow, rheumatoid arthritis, and many more (Davis, 2023). People with depressive problems have a higher chance of bacterial infection with a slower recovery (Frank et al., 2023). Depression is not only just a mental disorder but also a very vital reason for some serious health issues. Without proper treatment or counseling, the situation only worsens. Identifying the depression severity and acting according to it is a necessity.

1.5 Associated Risk Factors

Ageism is considered treating people differently because of their age, based on presumptions, bias, and discrimination. People often address negatively about older people's mental health and cognitive abilities. Some points this negative thought is accepted by the geriatric people, causing a downward spiral that leads to poor mental health.

Here are some key reasons behind elderly people's depression:

- **Biological Conditions:** Elderly people often live with various kinds of chronic conditions such as high blood pressure, cardiovascular diseases, diabetes, arthritis, and sometimes cancer too. These health issues work as a source of their pain and incapacity, and decrease their quality of life, eventually leading to depressive symptoms. Aging also creates imbalances in serotonin and norepinephrine, whose main function is to regulate mood (Ewumi, 2022).
- **Psychological Factors:** It is common to experience the loss of loved ones more often for elderly people. This may arise their fear of mortality, existential crisis, feeling of loneliness, and grief. Transforming from work-life to retirement can reduce a sense of purpose, which contributes to depression (Krans, 2025).
- **Social Factors:** As people get older, they often experience decreased social interactions because of living alone, mobility limitations, and reduced social networks. This social isolation may become a cause of their depressive thoughts.
- **Stigma and underdiagnosis:** Elderly people are often underdiagnosed because their symptoms may be mistakenly read, and this delayed treatment exacerbates depressive symptoms. Their complex medical conditions, biological vulnerabilities, and physical illnesses also increase depression.
- **Economic hardship:** After retirement or due to healthcare costs, they often face financial difficulties, which increase their stress level and depression.
- **Medication and physical health:** Geriatric people regularly intake multiple medications for their physical conditions, drug-drug or drug-food interactions are very common to them. Their depressive thoughts can arise as a side effect of the drug (Varma, 2012).

1.6 Prevalence and Effects

Depression is a concerning mental health problem among geriatric people in Bangladesh. Various studies have shown that the prevalence of depression among older people in Bangladesh is higher than global averages. A study by Uddin (2017) reported that the geriatric depression rate is 84.3%. WHO estimates that the prevalence of depressive issues among elderly people ranges from 10% to 20% globally (Mirkena et al., 2018). Some of the prevalence rates of geriatric depression around the world were reported: 44.4% in Egypt (El-Gilany et al., 2018), 42.5% in Indonesia (Pramesona & Taneepanichskul, 2018), 18.5% in Turkey (Yaka et al., 2014), 23.7% in Thailand (Wongpakaran et al., 2019), and 3.8% in Brazil (Barcelos et al., 2013). Geriatric people are more susceptible to developing depression because of socio-demographic factors, psycho-social behavior, and chronic illnesses (Shensa et al., 2018). Worldwide, the number of people aged 60 years in the population is increasing day by day. In the year 2019, the number of people aged over 60 years and older was 1 billion. This amount will be increased to 1.4 billion by the year of 2030 and 2.1 billion by 2050. This high geriatric population is leading to an increased number of psychiatric problems. Depression is taking the lead cause of impairment worldwide and is a vital contributor to the overall burden of illness. Despite being an increasing and common mental health problem among older people, almost 50% of depression cases are undiagnosed. People having depression problems have a 40% higher chance of premature death than their equivalents (Zenebe et al., 2021). Depression in old age can cause memory difficulties with stress and anxiety symptoms that are considered secondary to depression. Various researches have shown that geriatric people with depressive illness experience depression-related complications. They get along with the functional disabilities and slow down recovery from physical illness

1.7 Project Outline

The goal of this study is to identify the depression issues among geriatric people who are over 60 years old in Bangladesh. The primary aim is to determine the prevalence of depression by using the validated PHQ-9. The secondary objective is to identify socio-demographic, financial, and health-related risk factors that are associated with the geriatric depression problem. Another major goal is to improve the mental health services for the older people. The study had been designed based on a cross-sectional survey across urban and rural areas, data collection by using the tool PHQ-9 Questionnaire, data analysis, and expected outcomes. This project will give critical data to guide mental health-related strategies for Bangladesh's elderly population, leveraging the PHQ-9 reliability and cultural adaptability.

Chapter 2

Review of Literature

Not only in Bangladesh, but also worldwide, the prevalence of depression among elderly people is an increasing anxiousness. As the geriatric population is growing day by day, it has become difficult to cope with the factors that contribute to geriatric people developing successful solutions. This chapter is focusing on previous literature on geriatric depression, prevalence rates along with risk factors, and Bangladesh-specific contextual factors.

Different studies have shown different rates of geriatric depression study. One study held in an urban tertiary geriatric hospital has revealed a prevalence of 81.7%, where 52.6% of people have mild depression, 25.2% have moderate depression and 3.9% are experiencing severe depression (Tabassum et al., 2023). Another study has revealed that, in rural and urban areas, a prevalence rate of 52.5% emphasizes important differences between the populations of urban and rural areas (Hossain et al., 2024).

Risk factors such as socio-demographic conditions, behavioral, and physical health conditions have significant contributions to geriatric depression in the Bangladeshi population. Marital status has a vital role associated with depression; elderly people who are widowed or unmarried have a higher risk of having depressive thoughts (Tabassum et al., 2023). Lower education levels, unemployment, and retirement are also reasons for depression. But among all of them, health-related factors are the reasons that depressive syndrome arises most in geriatric people. Different chronic diseases, incapability, and immobility can cause geriatric depression.

There is significant disparity between urban and rural areas that has shown the difficulties older people face in different places. Studies have shown that urban elderly populations are more with nuclear family structures, and they suffer from chronic illness more than rural geriatric

people. But rural elderly people face risks from social isolation, lack of spousal assistance, and chronic physical health conditions. These results illustrate the necessity of interventions that adapt to the unique circumstances of each community.

Coronavirus disease 2019 (COVID-19) has a significant role that has exacerbated depressive thoughts among geriatric people in Bangladesh because of increased isolation, fear of getting infected, and disturbance in healthcare access. Research held during this time revealed the immediate arrangement for mental health support services for vulnerable older people.

Though there are a lot of studies that have been conducted on geriatric depression in Bangladesh, there are some research gaps. Insufficiency in national representative data about prevalence rates, limited examination of sex-specific inequality, and inadequate long-term investigation of the time-dependent course of depression.

This literature review has highlighted the increased prevalence of depression problems in Bangladesh among geriatric people. It also identifies the key reasons that have been contributing to this occurrence. The differences between elderly people living in the urban and rural areas make it difficult to help geriatric people with depression problems. The results serve as a foundation to understand the extent of this challenge and emphasise the necessity for correct interventions and elaborate research.

Chapter 3

Methodology

Mental health is a crucial component that has a very important impact on an individual's overall well-being. People can suffer from mental health problems at any age. But it becomes a more challenging task when it comes to geriatric people. As they are already experiencing various physical health-related issues, finding out their mental health issues turns into a challenge then. In this study, we focused on geriatric people of Bangladesh aged over 60 to evaluate their depression by using the PHQ-9 scale. The PHQ-9 is a globally practised tool used for screening, diagnosing, monitoring and quantifying the severity of depression. It consists of nine questions according to the diagnostic criteria for depressive disorders (Kroenke et al., 2001). The survey was done by interviewing urban and rural elderly people, both male and female, who are aged over 60. This study includes people of various regions, different occupations and educational backgrounds, different economic statuses, different family statuses, different marital statuses and other demographic parameters. Here we try to figure out how various kinds of demographic conditions affect the mental health of older people. We collected a total of 340 reports that include 103 male reports from rural areas, 100 female reports from rural areas, 86 male reports from urban areas and 50 female reports from urban areas.

3.1 Research Design

To conduct this project, we have done survey a research method. It is quantitative research method which is used worldwide. It involves gathering numerical data that can be analyzed statistically. Here, we did analytical survey to explore relationship between variables. It is designed with standardized questionnaires that consisted both demographic and psychometric questions.

Here are some advantages of survey research:

- It is cost-effective.
- Easier to access large sample sizes.
- Allows efficiency in data collection.
- Analysis of data is easy.
- Provides anonymity facility and honest responses.
- Allows access across diverse populations.

3.2 Detailed Questionnaire

In this study, to find out severity among the geriatric people in Bangladesh, we used PHQ-9. It consists of 9 questions that evaluate the severity of depression. We included 22 demographic questions as they play a vital role in surveys because they provide necessary information and insights about an individual. Through these general questions, researchers get thorough information about both physical and mental conditions. As we have already known that mental conditions have a direct impact on physical health, understanding the mental issue is important. For example, one's behaviour, psychotic conditions, food habits, social connections, economic status, family conditions, etc., can stimulate or discourage the physical conditions. Inversely, poor health situations, chronic diseases, hormonal imbalances, medications, and immobility can enhance mental health disorders. Demographic questions allow us to contextualise mental health findings.

3.2.1 Patient Health Questions-9

In this research study, we have implemented the PHQ-9 scale to administer to people. PHQ-9 comprises 9 questions, each of which assesses various aspects of depression experienced throughout the past two weeks. To get a cumulative score that goes from 0 to 27, add up the points for each item. The data collection process was held from December 2024 to March 2025 and lasted for four months. We made sure that all of the participants had given proper

information about the study and were kept completely anonymous throughout it. The PHQ-9 was invented to give a fast and accurate way to evaluate if someone has depression symptoms and how severe they are by using guidelines outlined in the Diagnostic and Statistical Manual of Mental Disorders (DSM). It has nine questions, and each one is a sign of a major depressive disorder. It gives a severity number that can be used to help investigators to make decisions (Kroenke et al., 2001).

Questions	Not at all	Several Days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself-or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite-being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

Table 1: Patient Health Questionnaire-9

The PHQ-9 is designed with nine items, which assess many facets of depression that have occurred within the last twelve days. To get a total score between 0 and 27, add up the points for each item. Spitzer et al., 2001, have shown the PHQ-9 a high degree of specificity and sensitivity in identifying generalised depression disorder and other common depression

disorders. If we were to classify depression according to the severity or score of the PHQ-9 score, then the result is given below:

PHQ-9 Scores	Depression Level
0-4	No Depression
5-9	Mild Depression
10-14	Moderate Depression
15-19	Moderately Severe Depression
20-27	Severe Depression

Table 2: Classification of depression based on PHQ-9 score

3.3 Data Collection

Data collecting was a crucial part of this study's aim to comprehend the state of mental health among geriatric people of Bangladesh. This detailed procedure included both urban and rural areas, giving us a thorough understanding of the difficulties and complexity faced because of demographic conditions.

- Rural area data collection:** Rural data gives profound insights into underprivileged people, emphasising more inequities and issues related to healthcare, education, and frameworks that are often neglected in urban-centric research. To assist the data collection in rural areas, we took the help of our relatives and local people. There were some influential village people who helped us in collecting data by gathering many people in one place. Moreover, village shopkeepers helped us by convincing customers so that we could collect data from them. Furthermore, village relatives took us from one house to another to collect data; thus, we successfully completed data collection in the rural area.

- **Urban area data collection:** Urban areas offer various advantages compared to rural areas that include access to a diverse population and the ability to give researchers the opportunity to gather data from different demographic and dynamic groups that allow the generalisability of findings. In urban areas, we interviewed geriatric people from various sights like parks, old homes, hospitals, social gatherings, shopkeepers and so on. Several data were collected with the help of relatives; some influential people also helped us to collect data by gathering people in one place.

3.4 Data Analysis Method

In this project, we have used International Business Machines- Statistical Package for the Social Sciences (IBM-SPSS)-version 25 to conduct some testes, such the Pearson correlation coefficient values, independent T-test, frequencies of demographic data and chi-square test. The Pearson correlation coefficient test determines the correlation between the PHQ range and some of the important demographic information. T-test was done to determine significant differences between the means of two groups of our data. Lastly, chi-square tests were held to find out significant associations between categorical variables. Various frequencies were also shown, as were of some significant demographic data.

3.5 Limitations

As surveys are usually made of standardised questions, it may not capture complex or delicate opinions, which can result in a lack of depth in the data collection. Again, as the survey is relied on self-reported data, it can be biased or inaccurate, as participants may not be fully truthful about their answers. Moreover, answers can be influenced by their current mood or the situation.

Chapter 4

Result

4.1 Frequency in Symptomatic and Non-symptomatic Depressive Groups

Here we have tried to classify our collected data according to some parameters to see geriatric people have depression problem or not.

Age Range	Symptomatic Depressive Group	Non-symptomatic Depressive Group	Total
60-69	99 (29.11%)	107 (31.47%)	206
70-84	68 (20%)	54 (15.88%)	122
85-100	7 (2.05%)	5 (1.47%)	12
Total	174 (51.17)	166 (48.82)	340

Table 3: Comparison between age ranges with depressive groups

In Table 3, we have classified ages 60 to 100 into three age groups. We considered people 60-69 years old as Young-Old, people from 70-84 years as Old-Old and people from age 85-100 years as Oldest-Old. We can see young-old people are more prone to have depression problems than old-old and oldest-old geriatric people. Age group 60-69; this group had the highest number of participants (206), with 99 (29.11%) showing signs of depression and 107 (31.47%) not showing depression. Age group 70-84; out of 122 participants, 68 (20%) showed signs of depression, while 54 (15.88%) did not. Age group 85-100; This group had the fewest participants (12), with 7 (2.05%) showing depression and 5 (1.47%) not showing depression. Overall, out of the total sample size of 340 participants, 174 (51.17%) showed signs of depression, while 166 (48.82%) did not, indicating a slightly higher prevalence of depression among the surveyed population.

Sex (According to area)	Symptomatic Depressive Group	Non-symptomatic Depressive Group	Total
Male (Rural Area)	61 (17.94%)	42 (12.35%)	103
Female (Rural Area)	60 (17.64%)	40 (11.76%)	100
Male (Urban Area)	34 (10%)	53 (15.58%)	87
Female (Urban Area)	17 (5%)	33 (9.7%)	50
Total male	95 (27.94%)	95 (27.94%)	190
Total Female	77 (22.64%)	73 ((21.47%)	150

Table 4: Comparison between sex-according to area with depressive groups

In Table 4, the comparison between sex and according to areas (rural vs. urban) with depression status based on PHQ-9 scores is shown. In rural areas, among males, 61 (17.94%) showed signs of depression, while 42 (12.35%) did not. Among females, 60 (17.64%) showed depression, while 40 (11.76%) did not. In urban areas, among males, 34 (10%) showed depression, while 53 (15.58%) did not, and among females, 17 (5%) showed depression, while 33 (9.7%) did not. Overall, out of 340 participants, 172 (50.58%) showed signs of depression while 168 (49.41%) did not, with rural areas showing a higher prevalence of depression compared to urban areas. Finally, in comparison between sex with depression status based on PHQ-9 scores, out of 190 male participants, 95 (27.94%) showed signs of depression, and 95 (27.94%) did not. Out of 150 female participants, 77 (22.64%) showed signs of depression, and 73 (21.47%) did not. Overall, out of 340 participants, 172 (50.58%) showed signs of depression, while 168 (49.41%) did not, indicating a slightly higher prevalence of depression among males compared to females.

4.2 Results of Pearson Correlation Coefficient

Here I have compared between the PHQ range with some demographic information to find out the Pearson correlation value and significance (p value).

Demographic data	Pearson correlation	Significance (p value)
Sex	0.045	0.41
Age	0.074	0.173
BMI Range	-0.122	0.025
BMI category	-0.115	0.035
Chronic Disease	-0.148	0.006
Smoking habit	-0.023	0.673

Table 5: Pearson correlation value and significance (p value)

This table represents which demographic data are strongly associated with the depression severity and which are weakly associated. Chronic disease has the strongest correlation (-0.148) with high statistical significance ($p=0.006$) which indicates this demographic factor is strongly associated with changes in depression levels. From the values of BMI range and category, it is clear that BMI has meaningful relationships with depression levels, as it shows negative correlation (-0.122, -0.115) and high statistical significance ($p=0.025$, $p=0.035$). The rest of the demographic factors, like sex, age, and smoking habit, show very weak correlations that are not statistically significant, as the p-values exceed 0.05. This indicates they do not have any relationship with depression severity.

4.3 Chi-square Test

Demographic Data	Pearson chi-square value (χ^2)	Significance (p-value)	df
Sex	5.269	0.261	4
Age	89.563	0.996	128
BMI category	11.133	0.518	12
Chronic disease	6.227	0.183	4
Smoking habit	12.821	0.012	4

Table 6: Chi-square value

This table summarizes the association between depression severity and some of the crucial demographic factors (Sex, age, BMI category, chronic disease, and smoking habit) using the Pearson chi-square test. Among the five demographic data, according to the chi-square test, only smoking habit has a significant association with depression severity, with a p-value of 0.012.

4.4 Independent Sample T-test

Variable	Significant Difference	p-value	PHQ (Yes/No)
Age	No	0.098	Slightly older, but not significant
Sex	No	0.715	No difference
BMI Category	Yes	0.017	Lower BMI in depressed group
Chronic Disease	Yes	0.023	More chronic disease in depressed group
Smoking Habit	No	0.857	No difference

Table 7: Independent sample T-test value

This table shows that depression is significantly associated with lower BMI category with p-value of 0.017 and higher prevalence of chronic disease (p-value=0.023) but no significant association was found between depression and age, sex or smoking habit in this sample.

4.5 Analysis of Different Demographic Information Gathered for the Research

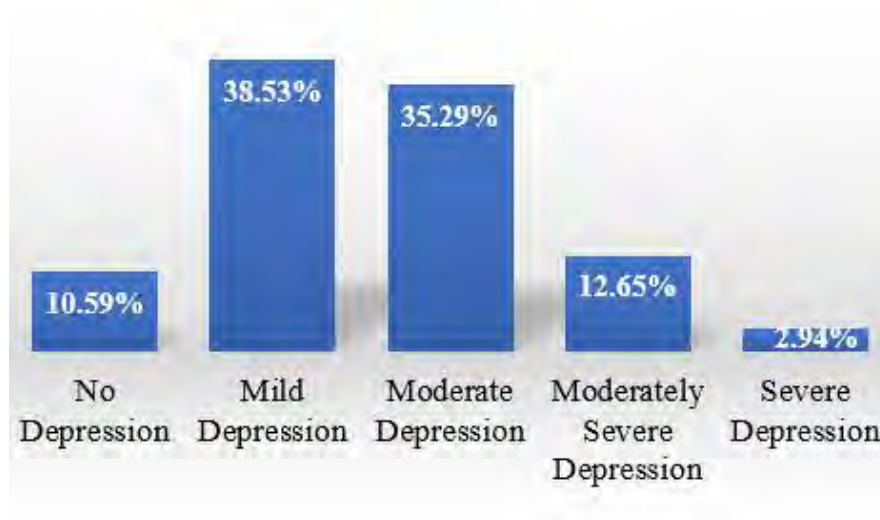


Figure 1: Graphical representation of participants affected with depression of various levels

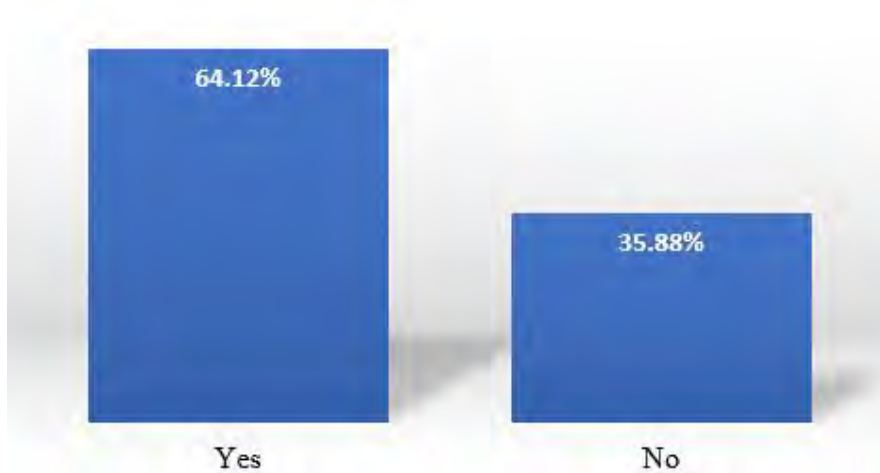


Figure 2: Graphical representation of participants having chronic disease



Figure 3: Graphical representation of marital status of participants

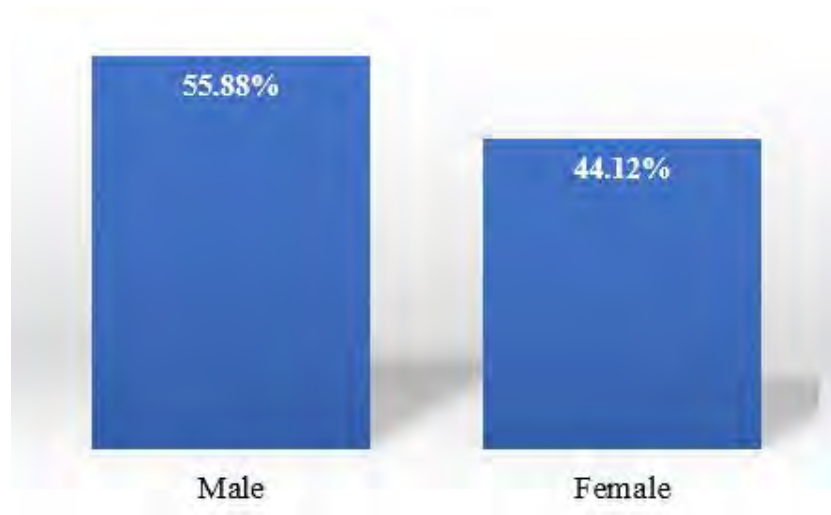


Figure 4: Graphical representation of sex differentiations

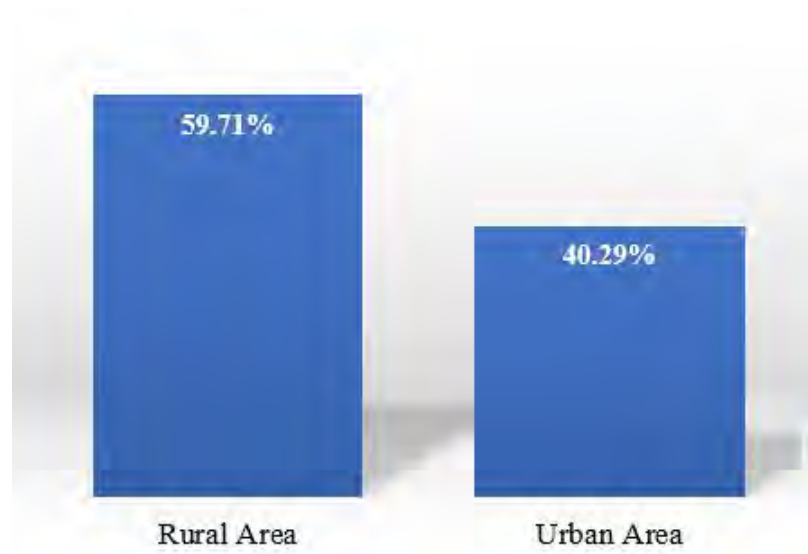


Figure 5: Graphical representation of participants' living area

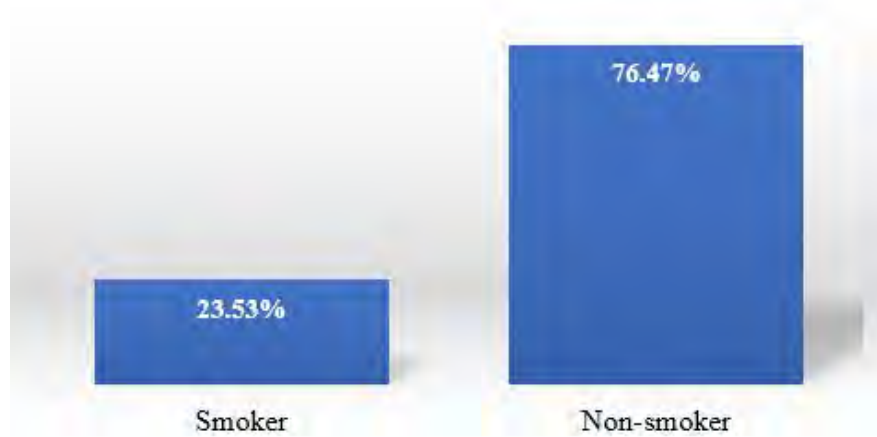


Figure 6: Graphical representation of participants' smoking habit

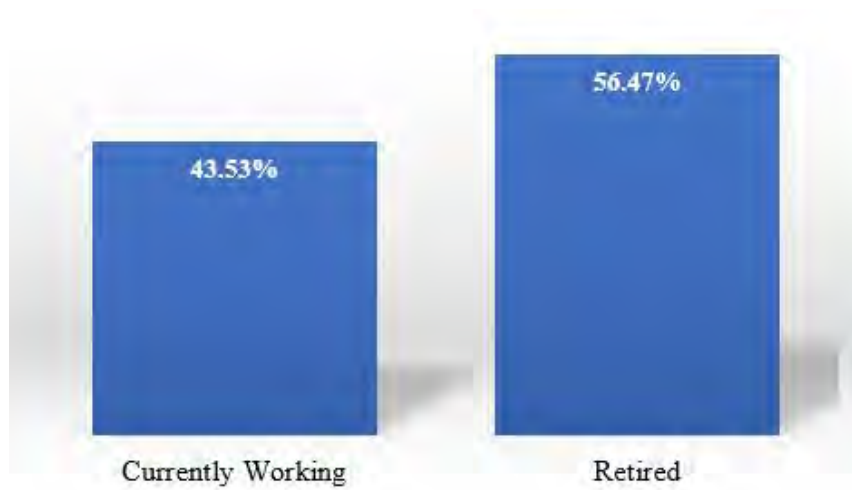


Figure 7: Graphical representation of participants' profession

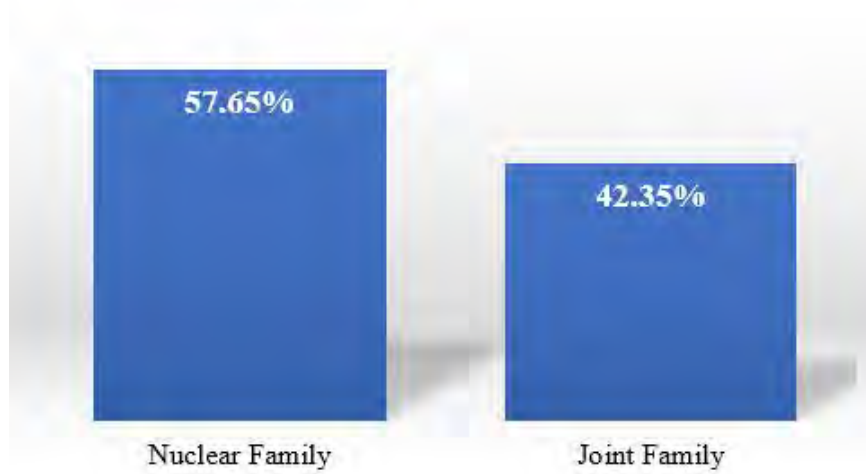


Figure 8: Graphical representation of family type of participants

Chapter 5

Discussion

This study on the prevalence and associated risk factors for depression among the geriatric population in Bangladesh discloses the depression severity in elderly people of various groups. We have collected data from people aged between 60 and 100 and classified them in three groups. Young-old (60-69 years), old-old (70-84 years), and oldest-old (85-100 years). According to our findings, young-old people have shown the most depression severity among these three groups. On the other hand, we have collected a total of 190 male data and 150 female data where a slightly higher prevalence of depression among males compared to females was observed. But the ratio between the symptomatic and the non-symptomatic depressive groups is almost equal. According to the living area, older people living in rural areas have shown a higher prevalence of depression compared to urban areas. To see how demographic situations, affect depression severity, we have conducted Pearson correlation coefficient in IBM-SPSS. It shows that demographic data that are strongly associated with depression levels are chronic disease and BMI category. That means these two factors have a strong relationship with depression severity by having a p-value of less than 0.05 and negative Pearson correlation values. We have also conducted Chi-square test to determine the association between two categorical variables. Here we have seen the association between various depression levels-no depression, mild depression, moderate depression, moderately severe depression, and severe depression and various demographic data. The observation of this test is that smoking habits have a significant association that highly influences the depression levels in elderly people with a p-value of less than 0.05. Independent sample T-test was held to determine how demographic variables make a significant difference between the symptomatic and the non-symptomatic depressive groups. We have observed the BMI category and chronic disease create a significant

difference between the two mentioned groups. We have seen older people with lower BMIs show more depression than others. On the other hand, people with chronic disease have more depression than people with no chronic disease. Both of the demographic variables have p-values less than 0.05.

This study has provided some valuable insights into the prevalence and risk factors of depression among the geriatric people of Bangladesh. First of all, they got to know about the key health and lifestyle factors that are connected to depression. This study found that demographic factors such as chronic disease, smoking habits, and BMI categories are strongly associated with depression severity. These findings help elderly people and healthcare providers recognise key risk factors and acts according to them. Secondly, by grouping them into categories according to their age, targeted mental health interventions can be applied for the most vulnerable subgroup. Moreover, understanding that lower BMI and chronic disease are connected with depression levels can motivate older people and caregivers to give importance to keeping up healthy body weight and managing chronic illness effectively. Furthermore, these results will work as proof that the government should arrange programmes that will target the elderly population in terms of dietary support, chronic illness management, and quitting smoking.

Many studies have reported higher depression rates in females worldwide, but our study's finding is somewhat contrary, which indicates possible cultural or regional differences. According to several studies, older people in rural areas frequently have less access to social assistance and healthcare, leading them to be at higher risk of depression. Other studies have also identified chronic illness, BMI association varies, and smoking habits can increase depressive symptoms. Some studies reports have also identified the oldest-old group with the highest depressive symptoms. The variability usually depends on population and region. Many studies treat the elderly as a single group (60+) that can miss distinctions but our study has

classified them in different elderly subgroups. The negative correlation between BMI and depression highlighted the importance of nutritional interventions in elderly mental health. Rural-urban differences have supported the development of rural-focused mental health services. Finding out the association of smoking with depression suggests smoking cessation programmes may reduce depression risk in the elderly.

The comprehensive age group stratification made it look at how severe depression was across different stages of ageing. Moreover, having a balanced number of men and women represented enabled sex-based comparisons. Furthermore, using more than one statistical method strengthens the robustness of the analysis by exploring relationships and differences across continuous and categorical variables. Also, multiple demographic variables opened multidimensional understanding of factors associated with depression. Some of the limitations include the cross-sectional design of the study, which captured data at a single point in time that limited the causality between risk factors and depression severity. Although 340 participants are a moderate amount, it may not fully represent the entire elderly population of Bangladesh. Also, self-reported data may introduce reporting bias or inaccuracies. Again, lack of longitudinal data limits understanding of changes over time.

This study has indicated the importance of prioritising early mental health interventions, as the young-old group has shown the highest depression severity. It also indicates the importance of conducting sex-sensitive mental health programmes. This study also indicates the rural mental health services and accessibility should increase. It initiates physical and mental healthcare by emphasising nutrition and chronic disease management. It also tells the importance of the implementation of regular depression screening for early detection. The results of this study are very important for making culturally appropriate, targeted, and integrated mental health programmes for geriatric people of Bangladesh. Addressing changeable risk factors that

include chronic illness, BMI, and smoking, while also considering differences across groups of people, can greatly increase the mental health and quality of life of elderly people.

Chapter 6

Conclusion

In conclusion, this study has shown a significant frequency of depression among the geriatric population in Bangladesh with noticeable differences in demographic factors such as age, sex, and living area. The results have determined that younger-old adults (60-69 years) and people living in rural areas experience higher levels of depression. The overall difference between male and female elderly persons was minimal, with a slightly higher prevalence found among males. Statistical analysis further identified chronic disease and lower BMI as significant risk factors for depression, as demonstrated by both Pearson correlation and independent sample t-tests. Furthermore, the chi-square test has highlighted smoking habits as a significant categorical factor that influences depression severity. All of these emphasize the multifactorial nature of depression in elderly people in Bangladesh and underscore the importance of targeted interventions addressing chronic disease management, nutritional status, and lifestyle factors such as smoking. A several-sided strategy including early detection, integrated care, lifestyle interventions, targeted support for high-risk groups, and public awareness is essential to reduce the burden of depression in the geriatric people of Bangladesh. These actions, guided by my study's findings, can help to improve the mental health and quality of life for elderly individuals.

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Appendix A.

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

[বাংলাদেশি প্রবীণ জনসংখ্যার উপর মানসিক স্বাস্থ্য এবং তার কারণ নিয়ে একটি গবেষণা]

The survey is designed to assess the mental health of geriatric population in Bangladesh. This research work has received ethical approval from the committee for ethical compliance in research, Department of Pharmacy, Southeast University (SEU/Pharm/CECR/021/2024). This is completely an 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 প্রবীণ জনসংখ্যার মানসিক স্বাস্থ্য এবং তার কারণ মূল্যায়ন করার জন্য করা হয়েছে। এই গবেষণা কার্যক্রমটি একটি ইনস্টিটিউশনাল রিভিউ বোর্ড (SEU/Pharm/CECR/021/2024) 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 senior citizen 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 প্রবীণ ব্যক্তি 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)

স্বাক্ষর:

তারিখ:

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

Section 1: Demographic Questions

১. বয়স বছরে (Age in years): _____

২. ওজন কেজিতে (Weight in kg): _____

৩. উচ্চতা (Height): _____

৪. লিঙ্গ (Sex):

- ☐ পুরুষ (Male)
- ☐ মহিলা (Female)
- ☐ অন্যান্য (Others)

৫.বসবাসের স্থান (Living Area)

- ☐ গ্রাম (Rural Area)
- ☐ শহর (Urban Area)

৬.বৈবাহিক অবস্থা (Marital Status):

- ☐ অবিবাহিত (Unmarried)
- ☐ বিবাহিত (Married)
- ☐ বিধবা/বিপত্নীক (Widowed)
- ☐ তালাকপ্রাপ্ত (Divorced)

৭. বসবাসের অবস্থান (Living Arrangement):

- ☐ পরিবার ছাড়া (Without Family)
- ☐ পরিবারের সাথে (With Family)

৮. পরিবারের ধরন (Family Type):

- ☐ যৌথ পরিবার (Joint Family)
- ☐ একক পরিবার (Nuclear Family)

৯. আপনার সাথে বসবাসরত মানুষের সংখ্যা (Number of people living with you): _____

১০. শিক্ষার স্তর (Level of Education):

- ☐ পড়ালেখা করি নাই (No formal education)
- ☐ প্রাথমিক (Primary)
- ☐ মাধ্যমিক (Secondary)
- ☐ স্নাতক/স্নাতকোত্তর (Graduate/above)

১১.পেশা (Profession):

- ☐ বর্তমানে কাজ করছেন (Currently working)
- ☐ কাজ করছেন না (Not working)

১২. মাসিক পারিবারিক আয় (Monthly Family Income): : _____

১৩.আপনার কি কোনো দীর্ঘস্থায়ী রোগ বা অবস্থা রয়েছে? (Do you have any chronic disease or conditions)?

- ☐ হ্যাঁ (Yes)
- ☐ না (No)

১৪.আপনার নিজের দৈনন্দিন কাজে অন্যের সাহায্যের প্রয়োজন হয় কি না? (Do you need any help to perform your regular activities)?

- ☐ হ্যাঁ (Yes)
- ☐ না (No)

১৫. সামাজিক কর্মকাণ্ডে অংশগ্রহণ করবার প্রবণতা (How often do you participate in social activities?)

- ☐ দৈনিক (Daily)
- ☐ সাপ্তাহিক (Weekly)
- ☐ মাসিক (Monthly)
- ☐ বিরলভাবে (Rarely)
- ☐ কখনো না (Never)

১৬. আপনি কি সামাজিক যোগাযোগ মাধ্যম ব্যবহার করেন? (Do you use social media to communicate with others):

- ☐ হ্যাঁ (Yes)
- ☐ না (No)

১৭. আপনি কি ধর্মীয় আচার-বিধি পালন করেন? (Do you follow any religious or spiritual practices)?

- ☐ হ্যাঁ (Yes)
- ☐ না (No)

১৮. আপনি কি নিয়মিত শরীরচর্চা (ব্যায়াম) করেন? (Do you perform regular physical exercise)?

- ☐ হ্যাঁ (Yes)
- ☐ না (No)

১৯. আপনার কি কোনো শখ বা আগ্রহ আছে, যেখানে আপনি প্রতিদিন কিছু সময় ব্যয় করেন? (Any hobby or interest where you spend some time daily):

- ☐ হ্যাঁ (Yes)
- ☐ না (No)

২০. ধূমপান অভ্যাস (Smoking Habit):

- ☐ ধূমপায়ী (Smoker)
- ☐ ধূমপান মুক্ত (Non-smoker)

২১. ফাস্ট-ফুড খাওয়ার অভ্যাস (Frequent Consumption of Fast-foods):

- ☐ মাসে দুইবার বা তার বেশি (Two or more in a month)
- ☐ মাসে দুইবারের কম (Less than twice in a month)

২২. আপনি কি নিয়মিত ভিটামিন/মিনারেল/ফুড গ্রহণ করেন? (Do you take any Food/Nutritional/vitamin supplements):

- ☐ হ্যাঁ (Yes)
- ☐ না (No)

Section 2: Psychometric measures: Depression related questions (PHQ-9)

১. গত দুই সপ্তাহে আপনি কতবার কিছু করতে সামান্য আগ্রহ বা আনন্দ অনুভব করেছেন? [Over the last 2 weeks, how often have you been bothered by little interest or pleasure in doing things?]
- ☐ একদিনও না (০) Not at all
 - ☐ বেশ কিছু দিন (১) several days
 - ☐ অর্ধেকেরও বেশি দিন (২) More than half the days
 - ☐ প্রায় প্রতিদিন (৩) Nearly every day
২. বিগত দুই সপ্তাহে কতবার আপনি অবনমিত, হতাশাগ্রস্ত এবং আশাহত অনুভব করে বিচলিত হয়েছেন? [Over the last 2 weeks, how often have you been bothered by feeling down, depressed, or hopeless?]
- ☐ একদিনও না (০) Not at all
 - ☐ বেশ কিছু দিন (১) several days
 - ☐ অর্ধেকেরও বেশি দিন (২) More than half the days
 - ☐ প্রায় প্রতিদিন (৩) Nearly every day
৩. বিগত দুই সপ্তাহে কতবার আপনি নির্ঘুম অথবা অত্যধিক ঘুমের সমস্যায় বিচলিত হয়েছেন? [Over the last 2 weeks, how often have you been bothered by trouble falling or staying asleep, or sleeping too much?]
- ☐ একদিনও না (০) Not at all
 - ☐ বেশ কিছু দিন (১) several days
 - ☐ অর্ধেকেরও বেশি দিন (২) More than half the days
 - ☐ প্রায় প্রতিদিন (৩) Nearly every day
৪. বিগত দুই সপ্তাহে কতবার আপনি ক্লান্ত অথবা সামান্য শক্তি অনুভব করা নিয়ে বিচলিত হয়েছেন? [Over the last 2 weeks, how often have you been bothered by feeling tired or having little energy?]
- ☐ একদিনও না (০) Not at all
 - ☐ বেশ কিছু দিন (১) several days
 - ☐ অর্ধেকেরও বেশি দিন (২) More than half the days
 - ☐ প্রায় প্রতিদিন (৩) Nearly every day
৫. বিগত দুই সপ্তাহে কতবার আপনি অতি সামান্য ক্ষুধা অথবা অত্যধিক খাওয়া নিয়ে অসন্তুষ্টি বোধ করেছেন? [Over the last 2 weeks, how often have you been bothered by poor appetite or overeating?]
- ☐ একদিনও না (০) Not at all
 - ☐ বেশ কিছু দিন (১) several days
 - ☐ অর্ধেকেরও বেশি দিন (২) More than half the days
 - ☐ প্রায় প্রতিদিন (৩) Nearly every day
৬. বিগত দুই সপ্তাহে কতবার আপনি হীনমন্যতার শিকার হয়েছেন এবং আপনার পরিবারকে হতাশ করেছেন এমন চিন্তা দ্বারা আক্রান্ত হয়েছেন? [Over the last 2 weeks, how often have you been bothered by feeling bad about yourself or that you are a failure or have let yourself or your family down?]
- ☐ একদিনও না (০) Not at all
 - ☐ বেশ কিছু দিন (১) several days
 - ☐ অর্ধেকেরও বেশি দিন (২) More than half the days
 - ☐ প্রায় প্রতিদিন (৩) Nearly every day

৭. বিগত দুই সপ্তাহে কতবার আপনি সাধারণ কাজ (যেমন সংবাদপত্র পড়া অথবা টেলিভিশন দেখা) এ মনোযোগ প্রদান করতে ব্যর্থ হয়েছেন? [Over the last 2 weeks, how often have you been bothered by trouble concentrating on things, such as reading the newspaper or watching television?]
- ☐ একদিনও না (০) Not at all
- ☐ বেশ কিছু দিন (১) several days
- ☐ অর্ধেকেরও বেশি দিন (২) More than half the days
- ☐ প্রায় প্রতিদিন (৩) Nearly every day
৮. বিগত দুই সপ্তাহে কতবার আপনি এতো ধীরে চলাফেরা কিংবা কথা বলেছেন, অথবা বিপরীতভাবে এতোটাই অধৈর্য্য এবং অস্থিরতা প্রকাশ করেছেন যা সহজেই মানুষ লক্ষ্য করে পেরেছে? [Over the last 2 weeks, how often have you been bothered by moving or speaking so slowly that other people could have noticed? Or the opposite, being so fidgety or restless that you have been moving around a lot more than usual?]
- ☐ একদিনও না (০) Not at all
- ☐ বেশ কিছু দিন (১) several days
- ☐ অর্ধেকেরও বেশি দিন (২) More than half the days
- ☐ প্রায় প্রতিদিন (৩) Nearly every day
৯. বিগত দুই সপ্তাহে কতবার আপনি মৃত্যুচিন্তা কিংবা নিজেকে আঘাত করার চিন্তায় বিচলিত হয়েছেন? [Over the last 2 weeks, how often have you been bothered by thoughts that you would be better off dead or of hurting yourself in some way?]
- ☐ একদিনও না (০) Not at all
- ☐ বেশ কিছু দিন (১) several days
- ☐ অর্ধেকেরও বেশি দিন (২) More than half the days
- ☐ প্রায় প্রতিদিন (৩) Nearly every day

অন্য কোন মন্তব্য:

গবেষকের নাম:

স্বাক্ষর:

তারিখ: