

Final Report of Summative Learning Project (SLP) presented to the BRAC James P Grant School of Public Health, BRAC University.

TITLE: Measuring the Prevalence of Depression and Anxiety Among the Ever married Women in Informal Settlements of Dhaka & Assessing Inter-Tool Consistency: A Cross-Sectional Study.

Amatul Haque Chaahat

MPH 20th Batch

Student ID: 24167003

Email: amatul.haque.chaahat@g.bracu.ac.bd

Supervisor

Dr. Zahidul Quayyum

Professor (Health Economics) and Director Research
BRAC James P Grant School of Public Health, BRAC University

Email: zahidul.quayyum@bracu.ac.bd

Co-supervisor

Priom Saha

Lecturer

Institute of Statistical Research and Training (ISRT)
University of Dhaka

Email: psaha@isrt.ac.bd

Mentors:

Farzana Sehrin

Research Fellow

BRAC James P Grant School of Public
Health Email: farzana.sehrin@bracu.ac.bd

Anisur Rahman Bayazid

Research Associate

BRAC James P School of Public
Health Email:

anisur.bayazid@bracu.ac.bd

Jinat Jahan Khan

Research Associate

BRAC James P School of Public
Health Email: jinat.khan@bracu.ac.bd

Khadiza Tul Kobra Nahin

Research Associate

BRAC James P Grant School of Public
Health, Email: khadizatul.nahin@bracu.ac.bd

Baby Naznin

Senior Research Associate

BRAC James P School of Public Health
Email: baby.naznin@bracu.ac.bd

Purpose: "In Partial Fulfillment of the Requirements for the Degree of Master of Public Health (MPH)."

Contents

Abstract.....	4
Background.....	4
Method.....	4
Findings.....	4
Conclusion.....	4
1. Introduction.....	5
1.1 Background.....	5
1.2 Rationale	7
1.3 Research Questions.....	9
1.4 Research Objectives.....	10
2 Conceptual Framework.....	10
3. Methodology.....	11
3.1 Study Design and Settings	11
3.2 Study Population	11
3.3 Sample Size	11
3.4 Sampling Strategy	12
3.5 Study Tool Development.....	13
3.6 Variables of Interest.....	14
3.7 Data Collection Process	15
3.8 Data Analysis.....	16
3.9 Ethical Considerations.....	17
4. Findings.....	17
4.1 Characteristics of the Participants	17
4.2 Prevalence of anxiety and depression.....	19
4.3 Associated factors of anxiety and depression	21
4.4 Percentage of the severity of anxiety and depression	23
4.5 Consistency between the scores for anxiety (GAD-7 & BAI) and depression (PHQ 9 & BDI-II).....	23
4.6 Consistency in Association.....	25
5. Discussion.....	27

5.1 Limitation.....	32
6. Conclusion.....	32
7. Reference	33
8. Annex	38

Abbreviations

PHQ-9 : Patient Health Questionnaire

GAD-7 : Generalized Anxiety Disorder

BAI : Beck Anxiety Inventory

BDI-II : Beck Depression Inventory-II

BDHS : Bangladesh Demographic and Health Survey

HIES : Household Income and Expenditure Survey by the Bangladesh Bureau of
Statistics.

LMIC : Low- and middle-income countries

Abstract

Background

The burden of mental health disorders is rapidly escalating into a global crisis, particularly in low income countries like Bangladesh. Residents facing poor living conditions in informal settlements in Dhaka, face increased mental and physical health challenges, with women at a higher risk for disorders such as depression and anxiety. This study aims to evaluate the use of two specific tools in assessing the mental health disorders of ever-married women aged 18-64. The tools used to measure anxiety are GAD-7 and Beck Anxiety Inventory and depression are PHQ-9 and Beck Depression Inventory-II. Furthermore, this study examines the consistency of scores gathered from these instruments across different severity levels of each condition.

Method

316 residents from the informal settlements of Shyampur and Dakshinkhan areas of Dhaka City participated in our study. After excluding incomplete questionnaires, 292 were included in the final analysis. Our questionnaire was based on the Bengali version of four existing tools. We conducted descriptive and bivariate analyses to measure prevalence and performed chi-square tests to check score consistency across severity levels of depression and anxiety.

Findings

In ever-married women aged 18-64 in informal settlements, anxiety prevalence is 55.82% on the GAD-7 scale and 59.25% on the BAI. Depression prevalence is 62.67% on the PHQ-9 and 50.00% on the BDI-II. The consistency of GAD-7 and BAI scores for minimal and severe levels of anxiety are 70.54% and 81.25%, respectively. For depression, minimal and severe case consistency is 85.32% and 100%.

Conclusion

This study revealed higher anxiety and depression among participants, highlighting the need for increased budget allocations for mental health care. The government should also improve the availability and accessibility of services for women and draw attention to raising mental health awareness. Notably, the anxiety and depression rates from the two tools were similar, indicating they can be used interchangeably when specific conditions are not present.

1. Introduction

1.1 Background

Good mental health is a fundamental component of our overall health and well-being. In the current world, mental health conditions are significantly contributing to the global burden of disease. In 2019, mental health disorder was estimated to account for around 418 million disability-adjusted

life years (DALYs), representing 16% of the total global DALYs. The estimated economic cost of this burden is approximately USD 5 trillion (Arias et al., 2022). The World Health Organization (WHO) has reported that approximately one in eight people experience a mental disorder worldwide. Anxiety and depression are the most common ones (Risal, 2011). A study suggested that approximately 50% of individuals are likely to encounter at least one mental disorder by the age of 75 McGrath et al. (2023).

Depression is the leading cause of morbidity and disability, with its prevalence estimated to be between 0.4 and 15.70% across countries (Cristóbal-Narváez et al., 2020). In low-income countries, evidence shows that depression is estimated to reach ~5% by 2030. Studies have shown that anxiety and its related disorders are the most prevalent among all mental health conditions, and women are disproportionately the worst sufferers. The prevalence of anxiety ranges between 0.9% and 28.3% (Baxter et al., 2013; Fairbrother et al., 2016). It has also been stated across numerous studies that depressive and anxiety disorders are much higher and more prevalent among the female population (Altemus et al., 2014). It is particularly common among women, especially in LMICs (Wilson et al., 2024). Winter et al. (2023) have found that among the women in the urban slum of Nairobi, Kenya, about 19% of the participants had major depressive disorders.

The National Mental Health Strategic Plan (2020-2030) noted that in Bangladesh, the rate of mental disorders among adults is greater in women (18.9%) compared to men (15%). According to the latest Bangladesh Demographic Health Survey 2022 report, the prevalence of depression and anxiety symptoms among married women aged between 15-49 years are 20% and 5%, respectively. It is seen that mental health disorders are constantly being overshadowed by other health problems, particularly in the urbanizing megacities of developing countries. A relatively large population lives in informal settlements, and mental health disorders such as depression and anxiety are often neglected health outcomes there (Gruebner et al., 2012). In a city like Dhaka, the

6

capital of Bangladesh, around 7 million people reside in ~3,394 slums and have poor health conditions (Koly et al., 2021). Issues like mental health are also neglected due to persistent stigma towards mental health, limited access, lack of awareness of mental health services, and lack of prioritization (Bangladesh Demographic and Health Survey, 2022). A study carried out during the COVID-19 pandemic revealed that 53% of residents in Dhaka's informal settlements experienced mild to severe anxiety. The study noted that this prevalence was significantly high (Koly et al., 2021).

However, no such study was found that investigated the depression and anxiety status of the ever married adult female population residing in the urban informal settlement settings in Dhaka. As this specific population is vulnerable to developing mental health conditions and to not receiving essential health care services, it is imperative to assess the overall level of their mental health, particularly depression and anxiety, to prioritise their health. Therefore, current study aims to assess the prevalence of anxiety and depression in the adult female population in the informal settlements in Dhaka city.

Over the years, to assess anxiety and depression across different populations and settings, various tools have been developed. Among the most popular are the Beck Depression Inventory-II (BDI-II) and the Patient Health Questionnaire-9 (PHQ-9) for depression. The BDI has been in use since 1961 in both clinical and research environments and was updated to the BDI-II in 1996 to better align with the criteria for major depressive disorder as defined in the Fourth Edition of the Diagnostic and Statistical Manual (DSM-IV) (Beck et al., 1961). This inventory contains 21 items (García-Batista et al., 2018). The PHQ-9 was developed in the mid-1990s specifically for depression screening in primary care settings, but it also serves as an effective measure of severity (Kroenke et al., 2001a). It is composed of nine items derived directly from the DSM-IV depression criteria (Kung et al., 2013).

Similarly, for anxiety, two widely used tools are Generalized Anxiety Disorder (GAD-7) and Beck Anxiety Inventory (BAI). The Generalized Anxiety Disorder (GAD-7) questionnaire contains seven items and is a self-report anxiety questionnaire intended to assess the patient's health status during the previous 2 weeks. It was designed by Spitzer et al. (2006) and published in 2006 and is quick to administer and is now used in research and clinical settings. The Beck Anxiety Inventory is a self-report inventory for measuring the severity of anxiety in psychiatric populations. It has 21

items (Beck et al., 1988). All these tools mentioned have been translated into Bangla and validated in Bangladesh (Mostafa Alim et al., 2020; Naher et al., 2021; Naher et al., 2022; Redwan et al., 2020).

However, no such study has been found which investigated the level of consistency of scores of these tools (GAD-7 vs BAI) and (PHQ-9 vs BDI-II) to measure each condition. Therefore, this study aims to assess the severity of depression and anxiety by using two distinct measurement tools. It will further investigate the consistency of the scores obtained from these tools across various severity levels for each condition, ensuring that the assessments accurately reflect the

mental health status of ever-married women.

1.2 Rationale

Dhaka is one of the fastest-growing megacities in the world. It has been reported that the current number of informal settlement dwellers is 7 million (Koly et al., 2021). New immigrants coming into Dhaka initially settled in these settlements. The immediate consequence is the growth of unhygienic informal settlements and squatter living arrangements (Angeles et al., 2009). In these areas, they face the risk of sudden eviction by the government. Regarded as "illegal residents," individuals in urban informal settlements often lack access to public sector resources, severely limiting their opportunities for formal education and healthcare (Rashid et al., 2013).

A study conducted in an informal settlement of Khulna division, Bangladesh, has reported that a significantly higher number of slum dwellers face mental health disorders. Anxiety and depression are more prevalent among the female population among the mental health disorders (Hijol et al., 2024a). Also, the presence of social stigma associated with mental illness often modifies people's help-seeking behaviour, frequently resulting in silent suffering, being left in isolation and facing discrimination. Thus, morbidity caused by mental health disorders is increasing rapidly and is left unacknowledged. Mental illness is often stringed with superstitions such as possession by evil spirits, which ultimately leads to not seeking help from any health facilities or professionals (Hasan et al., 2021a). Due to a lack of awareness and access to healthcare facilities, often taking care of mental health is perceived as the condition of the rich people who can afford it (Mental Health Is for Rich People, 2019). This does not mean that underprivileged people do not encounter such conditions. Giebel et al. (2020) mentioned that people hailing from disadvantaged backgrounds experience greater rates of depression and anxiety. As explained by Moncrieff et al. (2022), workers suffering from mental illness cannot be financially productive, and falling victim to depression or anxiety can make them fall into the vicious cycle of poverty.

Hasan et al. (2021) have reported that, the Bangladesh government has allocated only 0.44% of the total health budget for mental health care over the years, and only 0.11% of the population has free access to psychotropic medications. Mental health services mostly operate at tertiary or district-level hospitals situated in urban areas. With merely 260 psychiatrists available for a country of 162 million people, a significant portion of the population lacks access to mental health care. This indicates how little priority is given to mental health treatment. Bangladesh is prioritizing the integration of mental health services into primary healthcare, including in the challenged urban primary healthcare system. To achieve this, it is essential to encourage women

from disadvantaged socioeconomic backgrounds to utilize healthcare facilities. This study can facilitate progress in this area.

Women are more vulnerable to depression and anxiety (Altemus et al., 2014); this study will focus particularly on them. As mentioned in the Bangladesh National Mental Health Strategic Plan (2020-2030), gender differences also exist in patterns of help-seeking for mental health problems. This study will focus on ever-married adult women. Approximately 60% of ever-married women in Bangladesh have reported experiencing sexual or physical violence from their intimate partners. This alarming issue is often neglected by government officials and policymakers (Hasan et al., 2021). Previously, the Bangladesh Demographic and Health Survey (2022) focused only on married women between 18 and 49. This study will include adult women between the ages of 18 and 64. This age period captures a significant period of a woman's adult life, encompassing various socioeconomic, reproductive, and mental health-related factors that may influence mental well-being.

Thus, evaluating the mental health of this underserved group is crucial, particularly in the urban informal settlement, which is frequently overlooked in discussions about mental health. This study aims to shift healthcare facilities' focus on prioritizing women's health, especially mental health, given that (Bangladesh Demographic and Health Survey (2022) reports suggest that among women who have been diagnosed with depression and anxiety, only 12% have ever sought assistance.

Moreover, this study will utilise two tools (GAD-7 and BAI) to measure anxiety and two tools (PHQ-9 and BDI-II) to measure depression among our selected study participants. Although both the PHQ-9 and BDI-II measure depressive symptoms, they might vary in sensitivity and specificity in different contexts. Also, the PHQ-9 is often considered quicker to administer and thus might be more feasible in primary care or community health settings. In contrast, the BDI-II, being more detailed, may be better suited to clinical diagnosis. Additionally, no studies were found that incorporated (GAD-7 & BAI) and (PHQ-9 & BDI-II) for diagnosing and measuring the severity of anxiety and depression in the same group and measuring the consistency of the results of the instruments. In the past few years, the focus on the mental health status of different populations has increased in Bangladesh. Many of those studies have used the above-mentioned tools to measure the prevalence and severity levels. Therefore, measuring the consistency of scores between two different tools to measure depression (PHQ-9 & BDI-II) and anxiety (GAD-7 & BAI) on the same sample will help us to understand the extent to which the results match across the domains of each questionnaire. Also, researchers can select an instrument that best aligns with their

specific research objectives, population characteristics, and settings. The findings from this score consistency evaluation will facilitate comparisons of prevalence of depression and anxiety across similar or diverse populations. When both instruments are assessed for consistency of scores, further standardisation scores would be possible. It will support the integration of results in systematic reviews and a more robust pooling of data to conduct meta-analyses on depression prevalence or severity, enhancing the scope of mental health research.

1.3 Research Questions

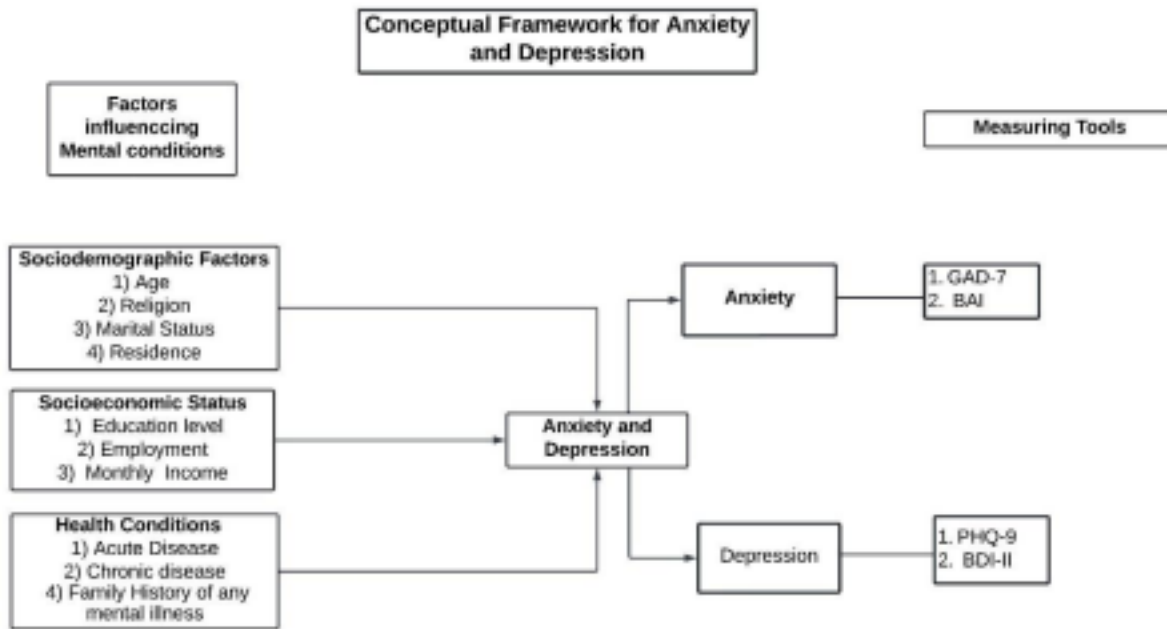
1. What is the prevalence and severity of Depression and Anxiety among ever-married adult women aged 18-64 years residing in urban informal settlements in Dhaka, Bangladesh?
2. How consistent are depression scores when measured using the Patient Health Questionnaire (PHQ-9) compared to the Beck Depression Inventory (BDI-II)?
3. How consistent are anxiety scores when measured using the Generalized Anxiety Disorder Scale (GAD-7) compared to the Beck Anxiety Inventory (BAI)?

1.4 Research Objectives

The objectives of this study are:

1. To assess the prevalence and severity of depression and anxiety among ever-married adult women aged 18-64 living in informal settlements in Dhaka City.
2. To assess the consistency between depression scores obtained using the Patient Health Questionnaire (PHQ-9) and the Beck Depression Inventory (BDI-II) and determine the level of agreement between these two commonly used instruments for assessing depression.
3. To assess the consistency between anxiety scores obtained using the Generalized Anxiety Disorder Scale (GAD-7) and the Beck Anxiety Inventory (BAI) and examine the level of agreement between these tools in measuring anxiety

2 Conceptual Framework



11

4. Methodology

3.1 Study Design and Settings

This research was conducted as a cross-sectional study in the informal settlements of Dakshinkhan and Shyampur, located within the Dhaka North City Corporation and South City Corporation, respectively, in Dhaka. These specific informal settlements were chosen purposively for this study.

3.2 Study Population

The study focused on ever-married adult women aged 18 to 64 residing in the chosen informal settlements. Participants aged 18-64, able to provide written consent, and living in the study area for at least one year were selected for this study. Participants who were unmarried, below 18 or above 64 years, unwilling to participate in a 40 to 60-minute interview or were not mentally, emotionally, or physically sound to participate in an interview were excluded from this study.

3.3 Sample Size

As this study has investigated the prevalence of anxiety and depression amongst the ever-married adult population, existing literature reporting prevalence rates for depression and anxiety was examined. As previously mentioned already that, National estimates for anxiety and depression

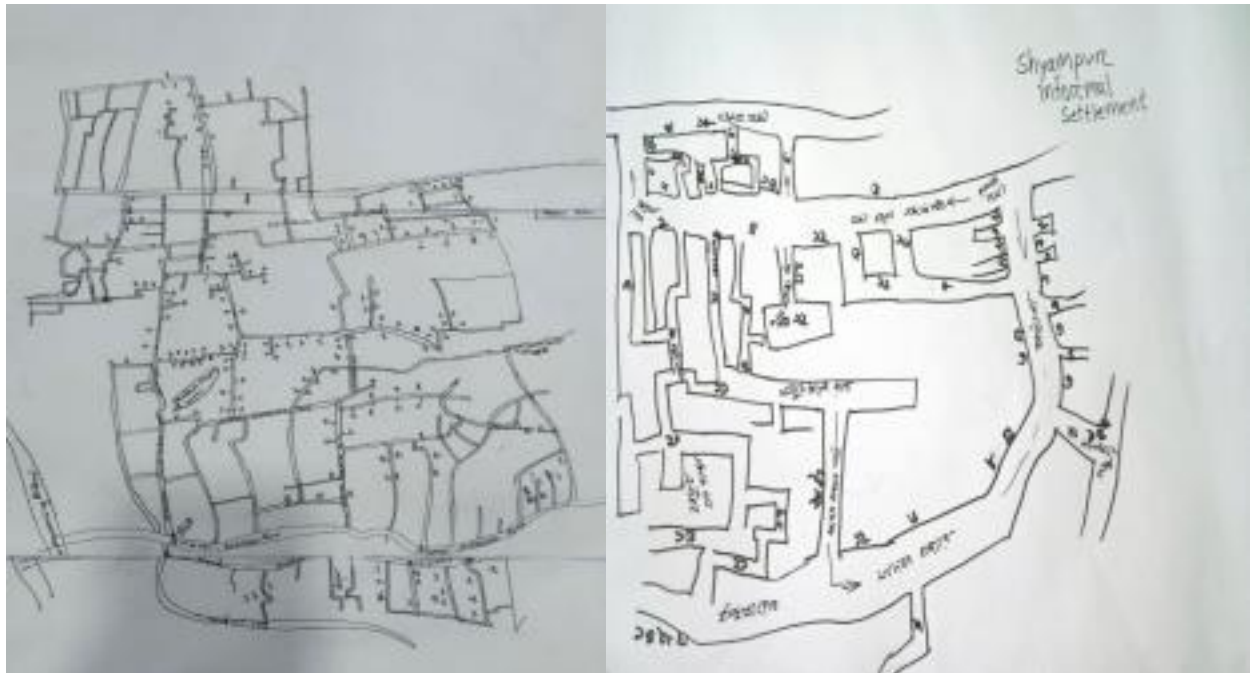
among adult women aged 15-49 years were 5% for anxiety and 20% for depression (Bangladesh Demographic and Health Survey (2022) However, estimates of depression and anxiety were not found among the informal settlements in our targeted population. (Koly et al., 2023) reported a prevalence of depressive symptoms at 77.50% and anxiety at 58.75% among women with a history of abortion in urban slums in Dhaka. However, these estimates were not applicable to the study population due to a difference in age group and a different focus, suggesting that the prevalence rates for each of these remain unknown.

The required sample size was calculated using Cochran's sample size estimation formula, presuming a prevalence of 50% to ensure the largest sample size possible with a margin of error of 10%. Due to the study's complicated design, a design effect of 1.5 was assumed, resulting in a sample size of 144 participants. Then, after considering a non-response rate of 10%, a sample size of 158 for each study site was calculated. After combining both sites, the final sample size for this study was 316.

$$\begin{aligned}
 n &= \frac{Z^2 \times p \times (1-p)}{d^2} \\
 n &= \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.1)^2} = 96 \times 1.5 = 144 \\
 &= 144 \times 1.10 = 158.4 = 158 \times 2 = 316
 \end{aligned}$$

4.4 Sampling Strategy

Data collection was conducted using systematic random sampling. Before initiating data collection, both study sites were visited to create a social map that counted the total number of households and geographical location in reference to our starting points, with the help of the local coresearcher who worked for a BRAC JPGSPH project and community members.



(Dakshinkhan) (Shyampur)

Fig. 1 Social mapping of Dakshinkhan and Shyampur

The map successfully marked the location of households considered as informal settlements. Key landmark areas in each setting were identified; for Shyampur, the starting point was the Boroitola CNG station, while for Dakshinkhan, the Dakshinkhan BRAC Learning Centre (BLC) was considered as the starting point. Approximately 1500 households in Shyampur and around 450 households in Dakshinkhan were identified, leading to our sampling interval as 10 in Dakshinkhan and 3 in Shyampur. In Shyampur, a household was randomly selected near the landmark, and a participant was identified based on the inclusion criteria. From that household, interviews were conducted with every tenth household, ultimately gathering information from 158 women. Similarly, in Dakshinkhan, a household was randomly chosen near the BLC, and every third household was interviewed, successfully reaching the target sample size of 158 participants.

3.5 Study Tool Development

After extensively reviewing the literature and documents, a structured questionnaire was developed with three sections on demographics, health status, and mental health assessment. Questions about sociodemographic characteristics were adapted from the Household Income and Expenditure Survey (HIES) 2022, by the Bangladesh Bureau of Statistics (Bangladesh Bureau of Statistics (BBS) & UNICEF Bangladesh, 2019; Preliminary Report, 2023). The questionnaire incorporated different sets of questions derived from validated measurement tools to assess the

anxiety and depression prevalence. It featured the Bangla version of the Patient Health Questionnaire (PHQ-9) and the Beck Depression Inventory (BDI-II) for evaluating depression, as well as the Generalized Anxiety Disorder 7-item scale (GAD-7) and the Beck Anxiety Inventory (BAI) for assessing anxiety. We got access to the validated Bangla version of the questionnaire for GAD-7, BAI and PHQ-9 (Bau et al., 2022; Naher et al., 2018; Redwan et al., 2020). As for BDI II we translated it in Bangla ourselves.

Throughout the development process, we sought feedback from our peers and supervisory team. Once the questionnaire was finalised in English, the questionnaire was translated into Bangla. Before starting the data collection process, we pretested the questionnaire in the Korail Slum of Banani and made necessary modifications based on that feedback.

3.6 Variables of Interest

3.6.1 Dependent variables

In this study, two individual dependent variables were considered: anxiety and depression. Each of these variables was assessed using two different scales. To measure the dependent anxiety variable, the GAD-7 and BAI scales were used, whereas, for depression, PHQ-9 and BDI-II were used. Following the measurements, depression and anxiety were categorised into dichotomous variables (Depression = yes/no) and (Anxiety = yes/no).

Generalised Anxiety Disorder

The Generalised Anxiety Disorder Question, which has been validated previously in Bangladesh (Redwan et al., 2020), was used to evaluate the level of anxiety symptoms in this study. This scale comprises seven items, and the responses are scored on a four-point Likert scale (0 = not at all, 1 = several days, 2 = more than half the days, and 3 = nearly every day). This questionnaire captures the responses and experiences over the past two weeks. The overall score ranges from 0 to 21. It scores 0-4 as minimal, 5-9 as mild, 10-14 as moderate, and 15-21 as severe. Then, the dichotomous outcome variable was created by considering minimal anxiety level as “no/no anxiety” and the rest of the three categories “mild”, “moderate”, and “severe” as “yes/Anxiety” (Koly et al., 2023).

Beck Anxiety Inventory

The Beck Anxiety Inventory was used in this study to measure the anxiety level of the participants. (Beck et al., 1988). This study has used a previously validated version in Bangladesh

of this tool (Naher et al., 2018). It measures the symptoms of anxiety for the last two weeks on a scale of 0- 63. Each item is scored on a Likert scale of 0-3. It classified the overall scores as minimal anxiety (0 to 7), mild anxiety (8 to 15), moderate anxiety (16 to 25), and severe anxiety (30 to 63). A dichotomous outcome variable was further categorised into two groups by scores to create a dichotomous outcome variable. The “minimal anxiety” level was considered as “No/no anxiety” and the rest of the categories were considered as “yes/Anxiety”.

Patient Health Questionnaire

The Patient Health Questionnaire (PHQ-9) was used to determine the depression levels (Kroenke et al., 2001a). This study incorporated a previously validated Bangla version of this tool (Bau et al., 2022). This scale consists of nine items, each scored with four Likert points, ranging from 1 to 4 (0 = not at all, 1 = several days, 2 = more than half the days, and 3 = nearly every day). The total score ranges from 0 to 27. It scores the total score into four categories: 0-4 for minimal, 5-9 for mild, 10-14 for moderate, 15-19 for moderately severe, and 20-27 for severe levels of depression. It was then categorized into a dichotomous variable by considering “minimal depression” as “No / No depression” and all other groups as "Yes / Depression." (Koly et al., 2023).

Beck Depression Inventory-II

The Beck Depression Inventory-II was used to measure depression levels in participants through 21 items rated on a four-point scale from 0 to 3. Participants described their experiences over the past two weeks, including the assessment day. Total scores ranged from 0 to 63, indicating 0-13 for minimal or no depression, 14-19 for mild depression, 20-28 for moderate, and 29-63 for severe depression. For this study, scores of 0-13 were classified as "No depression" and all others as "Depression"(von Glischinski et al., 2019).

3.6.2 Independent Variable

Age, marital status, religion, education, employment, chronic disease, acute disease, known mental health, family history, and income were the independent variables considered in our study.

3.7 Data Collection Process

A one-day training session was conducted to provide the four field data collectors with the necessary instructions to get familiarized with the study's objectives and the questionnaire. The

questionnaire was pretested to identify any ambiguities or inconsistencies in the question structure, which may lead to confusion for the respondent. Pretesting of the questionnaire was conducted in the Korail slum due to easy access to that location to validate both questionnaire structure and content and recognise any mistranslations. After completing the pre-test and incorporating the

feedback, the final version of the questionnaire was developed and deployed into the Kobo toolbox for collecting data using Android tablets.

The data collection period lasted eleven days, from November 27th to December 7th, 2024. After selecting the households according to our sampling technique, we invited women who met our inclusion criteria to participate in a face-to-face interview. The data collection was led by a research team comprised of three MPH students in a team and was supervised by Prof Z Quayyum. Each field data collector was assigned a designated section for each area, which ensured that there were no overlaps in data collection. To maintain the data quality, the data collection procedure was thoroughly supervised on the field for the data collection. Once the data was collected, it was reviewed. Any discrepancies found were managed through cross-checking. As mental health is a sensitive issue, during data collection, interviews were conducted keeping cultural sensitivity and participant's privacy in mind. It was ensured that the participants felt respected and safe throughout the process.

3.8 Data Analysis

After completing data collection using the Kobo Toolbox, the dataset was exported to Excel. The three MPH students then thoroughly reviewed the collected data to identify any discrepancies. After data cleaning, the variables were coded in the Excel sheet to prepare the data for analysis in STATA by maintaining a codebook for accuracy. Then, the file was imported into STATA 17.0 for the next analysis steps. Then, the variables' names and types were rechecked and renamed, coded, labelled, and destrired if needed. For any missing values found in anxiety and depression, measuring variables observations were dropped as this would jeopardize the score. Following this, the data was categorised based on our research interests. A descriptive analysis was conducted to determine the frequency and percentage distribution of the independent variables, and the results from Shyampur and Dakshinkhan were stratified separately. The prevalence of anxiety and depression across different levels was also reported by running a descriptive analysis. Then, a bivariate analysis was performed to explore the associations between the outcome and independent

variables, considering p -values of 0.001, 0.01, and 0.05. To report the consistency of scores between the scales for anxiety and depression, chi-square tests were performed. Chi-square tests were performed between GAD-7 and BAI for anxiety and also between PHQ-9 and BDI-II for depression. Finally, ordinal logistic regression was performed, and a coefficient plot was generated to report the consistency of the scores of anxiety scales (GAD-7 and BAI) and depression scales (PHQ-9 and BDI-II) with each independent variable while adjusting for the rest of the variables.

3.9 Ethical Considerations

Ethical approval was sought from the Institutional Review Board of BRAC JPGSPH (Protocol NO: MPH-2024-010) before proceeding with our research. Participants were informed about the study's purpose through a written information sheet. They were informed that their participation was voluntary and they could withdraw during data collection without facing any negative consequences. To finalize their consent, participants had to sign a consent form. Those who could not provide written consent were facilitated to give their consent via a thumbprint on the form. Participants who did not meet these consent requirements were excluded from the study.

The collected data is solely for research purposes. Each participant is assigned a unique ID number, ensuring their anonymity. Access to this data is restricted to the research team. The study did not offer any financial incentives to participants and upheld anonymity to protect their confidentiality.

4. Findings

4.1 Characteristics of the Participants

The demographic and socio-economic characteristics of the participants are presented in Table 1, separated for Shyampur and Dakshinkhan areas. After a comprehensive assessment of all relevant variables, the analysis included 292 participants, with 146 women from each study area. Among them, the majority (31.51%) were aged between 32-40 years in Shyampur, while in Dhakshinkhan, the majority (34.93%) were between 32-40 years. The educational attainment for most was the completion of primary education in Shyampur 37.67%, and in Dakshinkhan, the majority (28.08%) had attended secondary education. A significant portion of the study participants were unemployed (60.96%). The proportion of participants who were not suffered from any chronic disease was 62.33%. However, the majority reported acute health conditions (60.96%), particularly in Dakshinkhan (62.33%). Maximum women (88.70%) reported no known mental health conditions within the family. Only 26% had an income of more than 25,000 BDT in Shyampur in contrast to Dakshinkhan where 41.10% had income >25000 .

Table 1 Socio-demographic characteristics of the participants stratified by area.

Characteristics	Shyampur (n=146)	Dakshinkhan (n=146) Overall (N=292)	n (%)	n (%)	n (%)
Age					
18-23	46 (31.51)	27 (18.49)	73 (25.00)	24-31	32 (21.92)
24-31	48 (32.88)	80 (27.40)	32-40	41 (28.08)	51 (34.93)
40+	27 (18.49)	20 (13.70)	47 (16.10)	Marital Status	
Married	136 (93.15)	133 (91.10)	269 (92.12)	Widowed/Separated/Divorced	10 (06.85)
23 (7.88)	Religion¹				
Muslim	145 (99.32)	140 (95.89)	285 (97.60)	Non-Muslim	01 (0.68)
06 (4.11)	07 (2.40)	Education²			
No education	42 (28.77)	33 (22.60)	75 (25.68)	Primary	55 (37.67)
39 (26.71)	94 (32.19)	Secondary	43 (29.45)	41 (28.08)	84 (28.77)
Higher Secondary and above	06 (4.11)	33 (22.60)	39 (13.36)	Employment	
Yes	62 (42.47)	52 (35.62)	114 (39.04)	No	84 (57.53)
94 (64.38)	178 (60.96)	Chronic Disease			
Yes	56 (38.36)	54 (36.99)	110 (37.67)	No	90 (61.64)
92 (63.01)	182 (62.33)	Acute Disease			
Yes	87(59.59)	91 (62.33)	178 (60.96)	No	59 (40.4)
55 (37.67)	114 (39.04)	Known Family Mental Health History³			
Yes	12 (8.22)	21 (14.38)	33 (11.30)	No	134 (91.78)
125 (85.62)	259 (88.70)	Income (Monthly in BDT)⁴			
3000-18000	55 (37.67)	42 (28.77)	97 (33.22)	18000-25000	53 (36.30)
44 (30.14)	97 (33.22)	>25000	38 (26.03)	60 (41.10)	98 (33.56)

¹Others= Hindu, Cristian, Buddha

²Primary= Class 1 and up to class 5, Hafezi/Qawmi/Kharizi; Secondary= class 6 and up to class 10; Higher Secondary and above SSC/Dakhil/Equivalent, HSC/Alim/Equivalent, Diploma/ vocational, BA/ BSc/BCom/Fazil/graduate/ BA (honours), Postgraduate/MA/PhD/Kamil, Medical, Engineering, Midwifery/Nursing

³No= No family mental health history, Do not know.

⁴BDT= Bangladeshi Taka

4.2 Prevalence of anxiety and depression

Table 2 presents the prevalence of anxiety and depression among the participants. It shows that, according to the GAD-7 scale, the prevalence of anxiety among ever-married women was 55.82%. On the other hand, using the BAI scale, the reported prevalence of anxiety among our participants was 59.25% [Fig. 2].

Table 2 Prevalence of Anxiety and Depression among Adult women in informal settlements in Dhaka (n=292).

Category	Anxiety	Depression	GAD-7	BAI	PHQ-9	BDI-II	n (%)	n (%)	n (%)	n (%)
Yes	163 (55.82)	173 (59.25)	183 (62.67)	146 (50.00)	No	129 (44.18)	119 (40.75)	109 (37.33)	146 (50.00)	
Prevalence	55.82%	59.25%	62.67 %	50.00%						

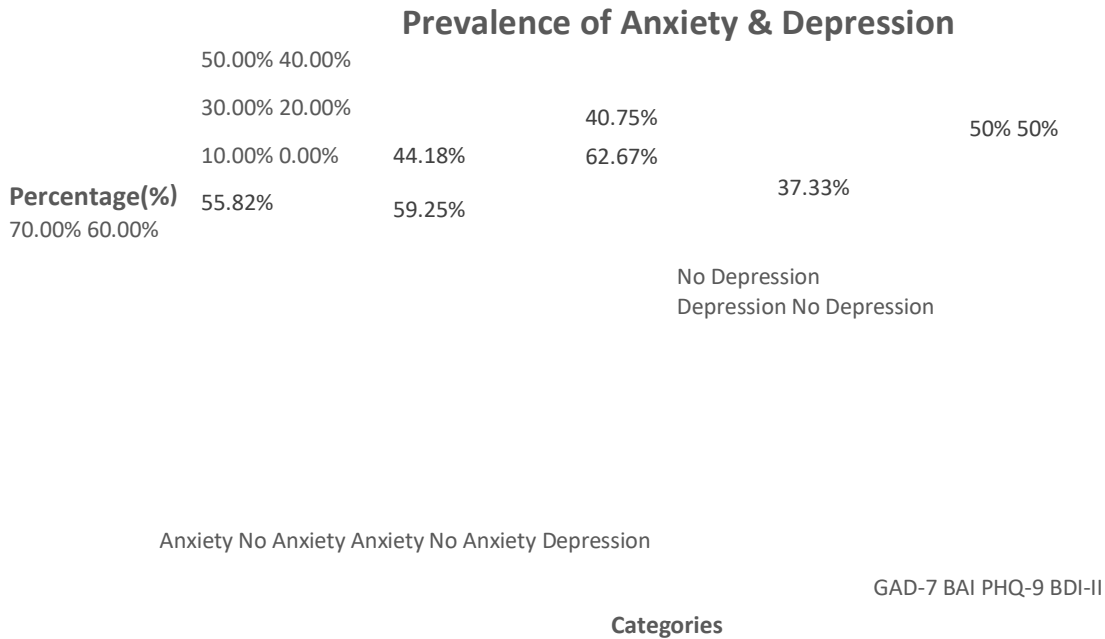


Fig. 2 Prevalence of anxiety and depression among the ever-married adult women in the informal settlements of Dhaka.

Table 2 also presents the prevalence of depression, as found using the PHQ-9 scale was 62.67%. Similarly, the prevalence reported using the BDI-II scale among our study participants was 50.00% [Fig. 2].

Table 5: Association between demographic variables and anxiety and depression

Anxiety Depression									
Variables	GAD-7 (n=163)		(n=173)		BDI-II (n=146)				
BAI			PHQ-9 (n=183)						
	Yes, n (%)	χ^2	Yes, n (%)	χ^2	Yes, n (%)	χ^2	Yes, n (%)	χ^2	Age
18-23	30 (18.40)		35 (20.23)		27 (18.49)				
			37 (20.22)						
24-31	42 (25.77)		41 (23.70)		48 (26.23)		34 (23.29)		
					32-40	58 (35.58)	64 (36.99)	63 (34.43)	54 (36.99)

177 (96.72)	0.51	142 (97.26)		
0.15 Non-Muslim	06 (3.68)	06 (3.47)	06 (3.28)	04 (2.74)
Education	2.60	2.08	1.63	
No Education	49 (30.06)	52 (30.06)	54 (29.51)	48 (32.88)
Primary	53 (32.52)	56 (32.37)	57 (31.15)	47 (32.19)
Secondary	44 (26.99)	45 (26.01)	49 (26.78)	33 (22.60)
Higher	5.31	9.97*		
5.53	3.86			
and above	17 (10.43)	20 (11.56)	23 (12.57)	18 (12.33)
Employment				
Yes	65 (39.88)	71 (41.04)	64 (43.84)	
2.82		69 (37.70)		
0.11 No	98 (60.12)	102 (58.96)	114 (62.30)	82 (56.16)
Chronic Disease				
Yes	80 (46.24)	13.28**	73 (39.89)	
0.71	0.37			67 (45.89)
8.40**				
No	84 (51.53)	93 (53.76)	110 (60.11)	79 (54.11)
Acute Disease				
Yes	112 (68.71)			107 (73.29)
18.31***	9.32**			18.65**
	116 (67.05)	6.62*	127 (69.40)	14.67***
	*		1.03	
No	* 51 (31.29)	57 (32.95)	56 (30.60)	39 (26.71)
Known Mental Health Family history				
Yes	23 (14.11)	23 (13.29)	18 (12.33)	
0.31		22 (12.02)		
No	140 (85.59)	150 (86.71)	161 (87.98)	128 (87.67)
2.90	1.68		0.25	
Income				
3000-18000	54 (33.13)	56 (32.37)	58 (31.69)	52 (35.62)
1.17				
18000-25000	57 (34.97)	56 (32.37)	63 (34.43)	49 (33.56)
25000-	0.64	0.55	0.57	
	52 (31.90)	61 (35.26)	62 (33.88)	45 (30.82)
			150000	

4.3 Associated factors of anxiety and depression

Table 5 demonstrates the significance of associations between the demographic variables and

anxiety and, similarly, between demographic variables and depression. A Chi-square test was used to determine the significance of the association between these variables and the outcome variables (anxiety status and depression status). From Table 3, it is observed that the prevalence of anxiety (GAD-7) was higher (35.58%) among the 32-40 year age group compared to other age groups, and the chi-square test shows a significant association between age and the prevalence of anxiety (GAD-7). Similarly, the prevalence of anxiety (BAI) was also higher (36.99%) among 32-40 year age group, with a significant association. The prevalence of anxiety was higher in both scales. It was 51.53% in GAD-7 and 53.76% in BAI among women without chronic diseases. However, for acute diseases, the prevalence of anxiety was higher at 68.71% in GAD-7 and 67.05% in BAI among women who suffered from the disease, showing a statistically significant association between acute disease and anxiety (GAD and BAI).

However, the prevalence of anxiety by both scales (GAD-7 and BAI) was greater among married (GAD-7 90.18% and BAI 93.06%) and Muslim women (GAD-7 96.32% and BAI 96.53%). The prevalence of anxiety was similarly higher among women who completed primary education (GAD-7 32.52% and BAI 32.37%) and those who were unemployed (GAD 60.12% and BAI 58.96%) as well. No statistically significant association was found between having a known family history of mental health issues and anxiety (GAD and BAI). Family income also indicates no significant association with anxiety as measured by both the GAD-7 and BAI scales. However, there was a higher prevalence of anxiety among the “3000-18000” BDT income group for GAD 7 (33.13%) and among the “25000-150000” BDT income group for BAI (35.26%).

Table 5 also reports the prevalence of depression in our study population. It shows that the prevalence of depression was higher (PHQ-9 34.43% and BDI-II 36.99%) among the age group of “32-40” years compared to other age groups. Similarly, there was a statistically significant association between chronic disease and the prevalence of depression measured by PHQ-9. However, this association was absent when measured by BDI-II. The prevalence of depression was higher among women suffering from an acute disease (PHQ-9 69.40% and BDI-II 73.29%) compared to those who did not suffer from the disease and were significantly associated with acute disease conditions as measured by both scales.

The prevalence of depression was higher among women without a known mental health family history (PHQ-9 87.98% and BDI-II 87.68%). The prevalence of depression was higher (PHQ-9 34.43% and BDI-II 33.56%) among the income group “18000-25000” when measured by both scales.

GAD-7 vs BAI

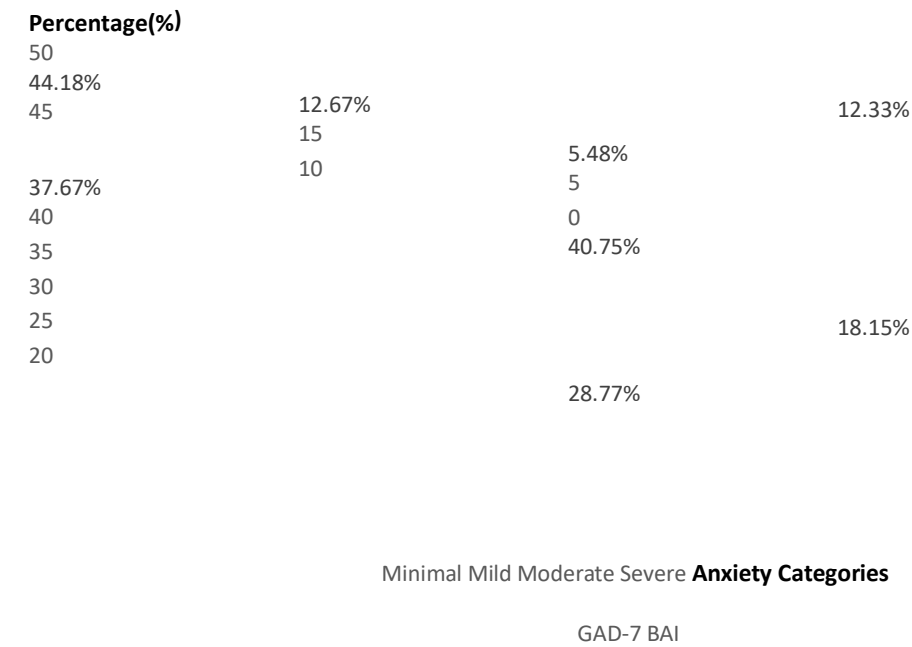


Fig. 3 Comparison of scores across the levels of anxiety using GAD-7 and BAI scales.

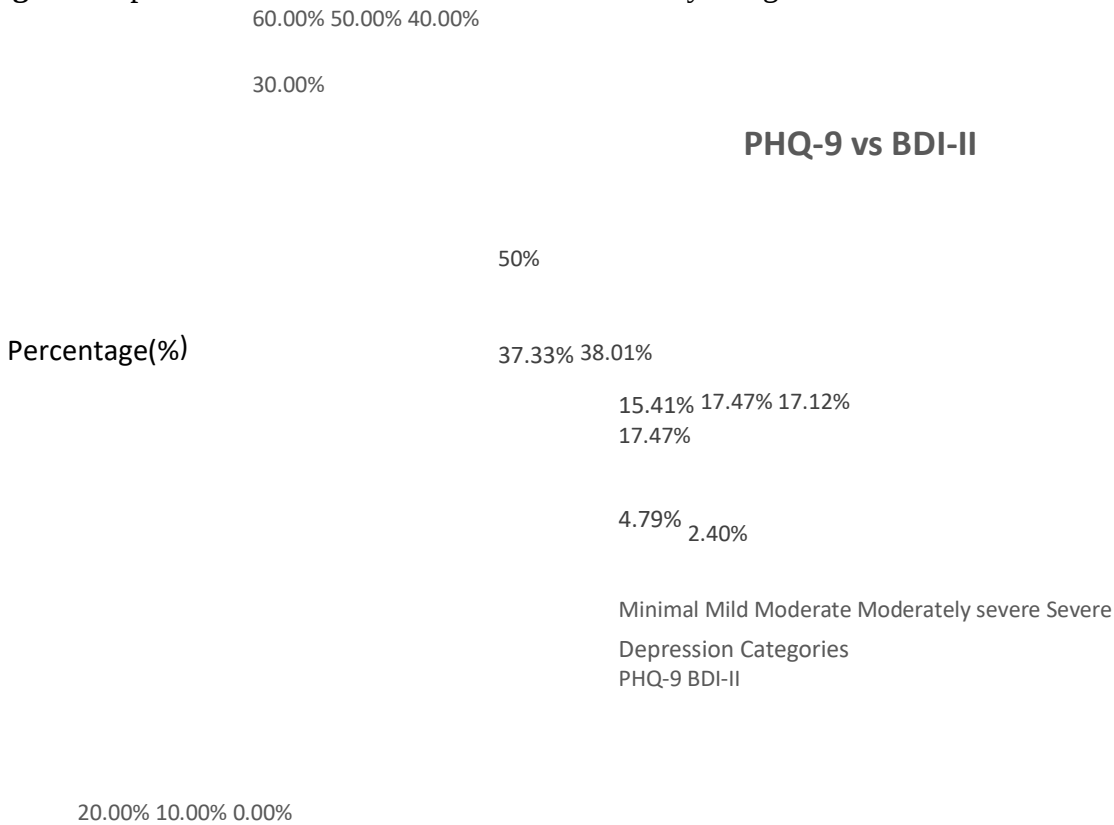


Fig. 4 Comparison of scores across levels of depression using PHQ-9 and BDI-II

scales. **4.4 Percentage of the severity of anxiety and depression**

Figures 3 and 4 show the levels of anxiety and depression severity experienced by each participant. By using GAD-7, the percentage found for minimal anxiety was 44.18%, the highest among all the categories. Similarly, according to BAI, the reported levels of anxiety severity were 40.75% for minimal. For depression, the PHQ-9 found that 37.33% of participants were minimally depressed, while severe depression among women was only 2.40%. Additionally, the BDI-II found minimal depression to be at 50% and severe depression at 17.12% [Table 3 & 4, Annex].

4.5 Consistency between the scores for anxiety (GAD-7 & BAI) and depression (PHQ-9 & BDI-II)

Table 6 shows the consistency between the scores of different anxiety levels obtained using the GAD-7 and BAI scales. For the minimum level of anxiety, 70.54% of the cases were consistently specified by both the scales, GAD-7 and BAI. Among the remaining 29.46% misclassification error, “minimal anxiety” of GAD-7 was misclassified as “mild anxiety” (24.03%) and “moderate anxiety” (3.88%), and “severe anxiety” (1.55%). Similarly, the level of severe anxiety had been consistently identified in 81.25% of cases by using both scales, with 18.75% of “severe anxiety” of GAD-7 misclassified as minimal (0.00%), mild (6.25%) and moderate (12.50%) anxiety by BAI scale.

Table 6: Consistency between the scores of anxiety levels by GAD-7 & BAI

GAD-7 Minimal Anxiety	Anxiety Mild Anxiety	Moderate Anxiety	Severe Anxiety
n (%)	n (%)	n (%)	n (%)
Minimal Anxiety 91 (70.54)	31 (24.03)	05 (3.88)	02 (1.55)
Mild Anxiety 27 (24.55)	37 (33.64)		
Moderate Anxiety 20 (18.18)	26 (23.64)	01 (2.70)	15 (40.54)
Severe Anxiety 0 (0.00)	01 (6.25)	02 (12.50)	13 (81.25)

Only 33.64% of the cases were consistently classified as mild level of anxiety, and 24.32% of cases were consistently classified as moderate level of anxiety by both

GAD-7 and BAI scales. For Minimal and Severe levels of anxiety, both the scales seem highly consistent, whereas for mild and moderate levels of anxiety, the misclassification rate is high.

Table 7: Comparison between the scores of depression levels by PHQ-9 & BDI-

II BDI-II							
PHQ-9	Mild Depression		Severe				
	Minimal Depression	Moderate Depression	Depression				
	n (%)	n (%)	n (%)	n (%)			
Minimal Depression	93 (85.32)	12 (11.01)	04 (3.67)	0 (0.00)	Mild Depression	47 (42.34)	20 (18.02)
	29 (26.13)	15 (13.51)	Moderate Depression	06 (11.76)	13 (25.49)	14 (27.45)	18 (35.29)
Moderately Severe Depression				0 (0.00)	0 (0.00)	04 (28.57)	10 (71.43)
			Severe Depression	0 (0.00)	0 (0.00)	0 (0.00)	07 (100.00)

Table 7 describes the consistency between scores among the categories of depression measured by PHQ-9 and BDI-II. The “minimal depression” levels of PHQ-9 and BDI-II reported 85.32% consistency of scores among these categories. Among the remaining 14.68% misclassification error, “minimal depression” of PHQ-9 was misclassified as “mild depression” (11.01%) and “moderate depression” (3.67%).

Similarly, the consistency of scores between the levels of severe depression of PHQ-9 and BDI-II had been identified in 100% of cases by using both scales. As there are five categories in PHQ-9, therefore considering “moderately severe depression” as “severe depression” shows consistency in 71.43% of cases with the “severe depression” category of BDI-II. The remaining 28.57% misclassification error here was classified as moderate depression by BDI-II.

The rest of the two categories showed higher inconsistencies among the scores. Only 18.02% of the cases were consistently classified as mild level of depression with 81.98% misclassification error, reporting 42.34% as “minimal depression”, 26.13% as “moderate depression”, and 13.51% as “severe depression”. Also, only 27.45% of cases were consistently classified as moderate levels of depression by both PHQ-9 and BDI-II scales. For Minimal and Severe levels of depression, both the scales seem highly consistent, whereas for mild and moderate levels of depression, the misclassification rate is high.

4.6 Consistency in Association

Fig. 5 shows a coefficient plot comparing the scores of GAD-7 and BAI across six independent variables used in this study. The scores of GAD-7 and BAI are highly consistent for all the variables. The figure also presents that the scores of GAD-7 and BAI are significant for chronic and acute disease and income.

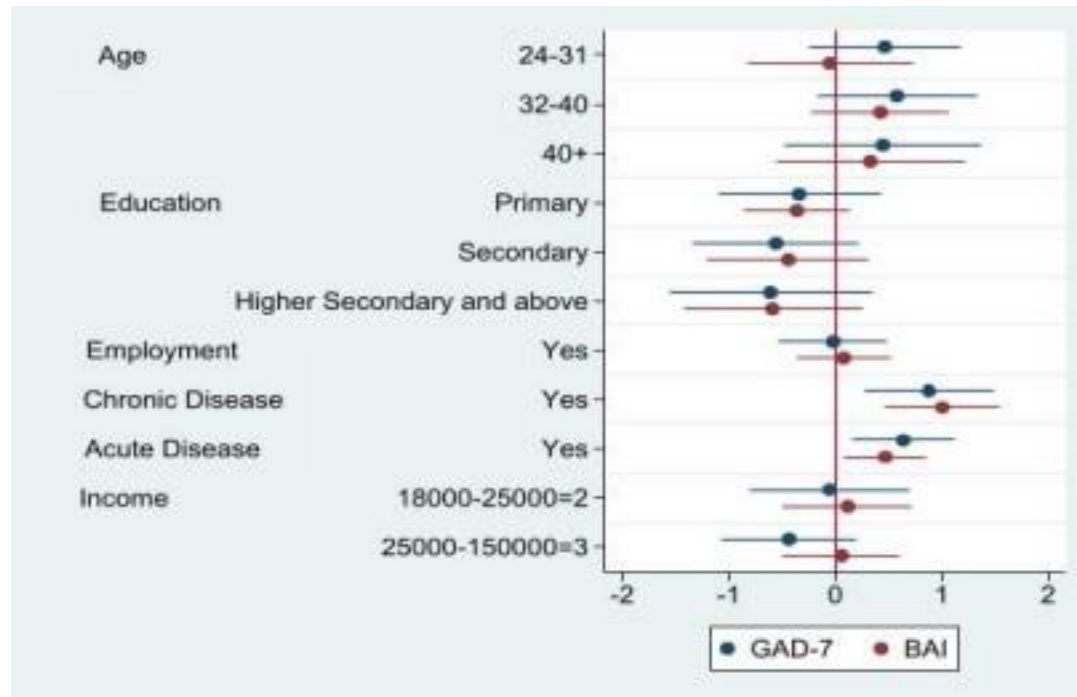


Fig. 5 Consistency of scores of GAD-7 and BAI across other independent variables

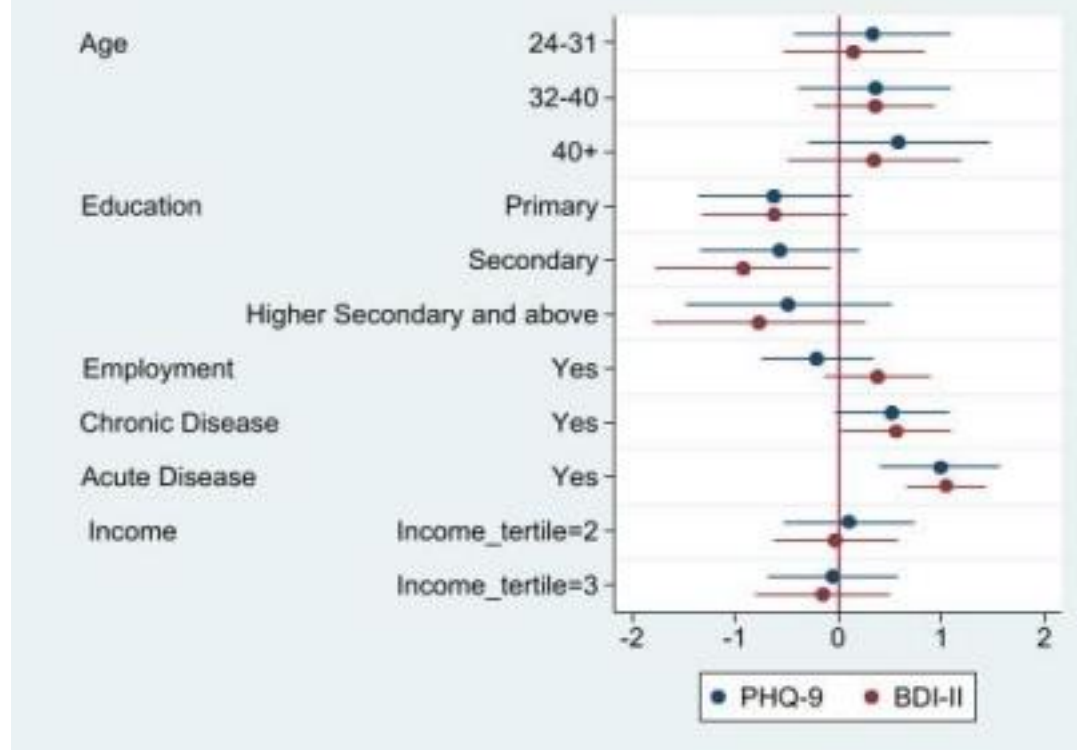


Fig. 6 Consistency of scores of PHQ-9 and BDI-II across other independent variables

Fig. 6 shows a coefficient plot comparing the scores of PHQ-9 and BDI-II across six independent variables of this study. The scores of PHQ-9 and BDI-II are highly consistent for all the variables. The figure also presents that the scores of PHQ-9 and BDI-II are significant for acute disease.

The results of ordinal logistic regression for anxiety and depression are presented in Table 8 [Annex]. The ordinal logistic model showed that compared to women having no acute diseases, those who have acute diseases had 1.90 times the odds of experiencing higher levels of anxiety for GAD-7 (OR= 1.90, 95% CI: 1.10-3.28) and for BAI 1.61 times the odds of experiencing higher levels of anxiety (BAI) (OR= 1.61, 95% CI: 1.10-2.35).

The ordinal logistic model for depression (PHQ-9) showed that acute disease has a significant association with depression. Compared to women having no acute diseases, those who have acute diseases have 2.70 times the odds of experiencing higher levels of depression (PHQ-9) (OR= 2.70, 95% CI: 1.66-4.39) while adjusting for other variables. From Table 8, the ordinal logistic model showed that acute disease has a significant association with depression (BDI-II). Compared to women having no acute diseases, those who have acute diseases have 2.85 times the odds of experiencing higher levels of depression (BDI-II) (OR= 2.85, 95% CI: 1.73-4.72).

5. Discussion

In Bangladesh, only 5% of residents in the informal settlements live in good-quality houses (Angeles et al., 2009). Overcrowding in these settlements has poor sanitation facilities, leading to an increase in the transmission of infectious diseases and, consequently, worsening physical health (Izutsu et al., 2006). As psychological well-being is affected by physiological well-being (Gruebner et al., 2012), people residing in informal settlements experience mental health issues. They are under continuous pressure of poverty, instability, and inadequate access to essential facilities, which increases their vulnerability to anxiety, depression, and other psychological disorders (Hijol et al., 2024b). Winter et al. (2023) suggested that compared to the general population, women residing in informal settlements may exhibit a higher prevalence and burden of depressive symptoms. Our study is the first in Bangladesh to report the prevalence of anxiety and depression among the ever-married female population aged 18-64 in informal settlements of Dhaka city. This study reveals a very high prevalence of anxiety and depression. According to the GAD-7, anxiety prevalence is 55.82%, while the BAI indicates it is 59.25%. In terms of depression, the PHQ-9 reports a prevalence of 62.67%, compared to 50.00% from the BDI-II scale. However, these estimates are much higher compared to the national average of anxiety and depression found

in married women of 15-49 years (Bangladesh Demographic and Health Survey 2022). This higher trend can be attributed to sociocultural factors that disproportionately affect women, including the demands of domestic work, exposure to domestic violence, various stressors at home, and the balancing act of multiple roles in both domestic and professional environments, indicating sociocultural marginalization and gender inequalities (Bezerra et al., 2021; Winter et al., 2023). Hijol et al. (2024) also reported that very high levels of anxiety (84.1%) and depression (72.7%) were found among the participants from the informal settlements of Khulna, particularly females more likely to report high levels of anxiety and depression.

In our study, it was found that GAD-7 and BAI both scales identified anxiety to be highest among the age group 32-40 years old women. Similar to that, depression measured by both PHQ-9 and BDI-II was also reported to be highest in this same age group. A study in India reports the highest prevalence of common mental disorders (anxiety and depression) among the age group of 40-49 years (Annajigowda et al., 2023). Along with socio-cultural elements, women exhibit a biological susceptibility to anxiety and depressive symptoms, especially during the reproductive phase. The influence of estrogen on mood regulation explains the elevated rates of mood and anxiety disorders in women from menarche through menopause. In addition to the connection between hormonal fluctuations during the premenstrual phase, postpartum period, and menopause, the hormones found in oral contraceptives and hormone replacement therapy further affect mood (Bezerra et al., 2021). In this study, Women attaining higher education were faced with less anxiety and depression compared to women who had no schooling or attended till primary education. Similar findings were reported in another study conducted in the women of informal settlements in Dhaka (Koly et al., 2023). Also, it was found in our study that anxiety and depression, measured by two tools in each condition, were found to be highest among the women who were unemployed and belonged to the lowest income category (3000-18000). Similar results were found in another study that women living in slums who were employed had lower depression scores on the PHQ compared to their unemployed counterparts. Previous research has also indicated that employment can enhance both physical and mental health, particularly by reducing depression levels in individuals (Koly et al., 2023). One of the important findings from our study was the higher percentage of anxiety measured by both GAD-7 and BAI and depression measured by PHQ-9 and BDI-II in women who were suffering from acute and chronic diseases. Women who were undergoing any health condition during the collection of data were mentally disturbed and reported a higher percentage of anxiety and depressive symptoms. Often, it is seen that deteriorative physical health condition negatively impacts the mental conditions of individuals. Numerous studies indicate a significant prevalence of depressive symptoms among patients with different somatic health issues (Stordal et al., 2003).

As our body and mental health are deeply rooted, any dysfunction on a somatic level can manifest as a mental health disorder. This indicates that our mental health is deeply associated with our physical well-being. For instance, a systematic review pooled the prevalence of depression level to be as high as 44.32% among infertile women in higher-income countries (Kiani et al., 2021).

In addition, this study has investigated the consistency of scores between two scales across the categories of anxiety and depression in the same sample. The consistency between the scales of anxiety was found to be very high for the categories of minimal anxiety (70.54%) and severe anxiety (81.25%). The GAD-7 was designed to assess and identify anxiety, targeting clinical samples in healthcare and the general population. (Merino-Soto et al., 2023). In this study, for the general population, the cut-off is set at 0-4 for minimal anxiety. For BAI, the cut-off for minimal anxiety was 0-7. Therefore, both scales consistently identified the absence of anxiety or the presence of negligible symptoms of anxiety. Likewise, for severe levels of anxiety, the cutoff value is set at 15 for GAD-7 and 30 for BAI, leaving a very distinct and wide range to identify severe cases of anxiety. Moreover, the BAI scale consists of items corresponding to cognitive and somatic symptoms (Hewitt & Norton, 1993). Therefore, participants who have severe anxiety will often have most of the somatic symptoms, if not all, along with cognitive symptoms (Zheng et al., 2019). This ultimately leads to high consistency. However, for mild and moderate levels of anxiety, the GAD-7 and BAI had moderately high levels of misclassification error. The cut-off value for mild anxiety in GAD-7 is 5-9, and for BAI is 8-15. Similarly, for moderate anxiety, the GAD-7 cut-off stands at 10-14, whereas BAI is 16-25. There is a possibility that all these cut-off values overlap due to complex combinations of anxiety symptoms.

Similarly, the consistency found between the scores of depressions measured by PHQ-9 and BDI II is also very high for minimal depression (85.32%) and severe depression (100.00%) categories. As the moderately severe category of the PHQ-9 scale was checked against severe depression of BDI-II, the consistency was also found to be as high as 71.43%. However, higher misclassification errors were observed for the mild and moderate levels between the depression measurement scales. A similar result has also been reported in a study that included three cohorts from India, the UK, and the USA. The consistency among the scores of minimal depression levels and severe depression categories is very high in all three samples, and higher misclassification error is presented in mild and moderate categories (Weobong et al., 2018). The PHQ-9 evaluates all nine symptoms based on DSM-IV criteria, placing a greater focus on physiological aspects. Conversely, the BDI-II is developed from the cognitive-behavioral therapy approach to depression, thus prioritizing cognitive symptoms (Choi et al., 2014). Both

the PHQ-9 and BDI-II consistently classify participants with either very negligible symptoms or no symptoms at all as minimal depression since most individual item scores for these participants fall between 0 and 1. Most studies on non-clinical samples found BDI-II item scores at the lower end of the range (0-3) (Wang & Gorenstein, 2013). It explains the possibility of identifying minimally depressed participants correctly. Similarly, severe depression often it is associated with cognitive problems (Perini et al., 2019). Therefore, most of the items of BDI-II have had higher scores for individuals suffering from severe depression, resulting in higher consistency with the scores of PHQ-9. Mild depression is scored between 5-9 in PHQ-9 and 14-19 in BDI-II and moderate depression is scored between 10-14 in PHQ-9 and 20-28 in BDI-II. The higher misclassification error in mild and moderate depression can be due to all these cut-off values overlapping due to complex combinations of depressive symptoms.

The current study revealed that anxiety scores from the GAD-7 and BAI, along with depression scores from the PHQ-9 and BDI-II in the coefficient plot, were more or less consistent with the independent variables. This suggests that anxiety levels assessed by these two scales would yield similar outcomes, whether tested against the same or different sets of independent variables. Consequently, using either scale to measure anxiety would result in minimal differences in the relationship between anxiety (GAD-7) and other independent variables when compared to anxiety (BAI) and these variables. Likewise, for depression, the correlation with independent variables was very consistent in both cases, indicating no change in the relationship between independent variables and depression when measured by either tool (PHQ-9 and BDI-II).

This present study offers a thorough understanding of the consistency of tools employed to assess the overall prevalence of anxiety and depression within our sample, as well as their uniformity across various categories. The prevalence rates of anxiety identified by both the GAD-7 and BAI are remarkably similar. Consequently, these tools can be utilised interchangeably in any study or setting to evaluate the prevalence of these mental health disorders. GAD-7 is utilized across the general population in primary care, mental health environments, and research studies. In contrast, the BAI is primarily employed with patients in psychiatric and research settings, though it is also applicable to healthy individuals. BAI features a greater number of questions compared to GAD 7, which necessitates more time for completion. Since BAI includes questions about somatic symptoms, if these are not specifically needed, GAD-7 can serve as an alternative to BAI.

Regarding the prevalence of depression assessed through PHQ-9 and BDI-II, the results were not very closely aligned. The PHQ-9 is advisable for use in primary care, psychiatry, general health,

or research contexts. In contrast, the BDI-II is predominantly employed for psychiatric and research purposes and typically requires more time for assessment. However, if incorporating BDI II is unfeasible in certain settings, PHQ-9 can be utilized instead, as it takes less time to administer due to having fewer items and being less complex than BDI. An Indian study suggested similar findings, highlighting potential loss of meaning during translation. While this applies to both measures, the BDI-II may encounter more translation challenges because of its complexity. As the PHQ-9 is a more straightforward tool, requiring less short-term memory than the BDI-II, the study indicates that in situations where illiteracy is a concern—particularly in low- and middle-income countries (LMICs)—researchers may favour the simpler PHQ-9 for participants who are not literate. Nonetheless, both measures remain valid for assessing the underlying constructs when participants independently read and complete the scales (Weobong et al., 2018b).

The mental well-being of women living in the informal settlements of Dhaka, Bangladesh, significantly impacts their everyday lives. Considering the high prevalence of anxiety and depression identified in our study, the mental health support available to women in informal settlements is extremely inadequate. They have minimal access to even basic mental health care facilities. Further research is essential, as these women are particularly vulnerable, highlighting the necessity for a more in-depth understanding of mental well-being. While there are some private and NGO mental health support groups, these women do not have access to them easily. It is crucial to ensure their access. The government and lawmakers should utilise the study's findings to ensure adequate psychological support for informal settlement residents, and such a study can help us ensure that budgetary allocation for mental health needs to be increased substantially. The researchers engaged in mental health research, finding the assessment of consistency among the tools, should use the knowledge for any future studies on a larger scale – particularly in informal settlements.

5.1 Limitation

One limitation of this study is that it is a cross-sectional study without any baseline data on the prevalence of anxiety and depression among women. Consequently, we are unable to compare our findings with any previous estimates. This results in our first limitation: we cannot determine which of the scales (GAD-7 and BAI for anxiety; PHQ-9 and BDI-II for depression) yields more accurate results. We could not establish any cause-and-effect relationships with the independent variables for the same reasons. Another limitation we faced was the lack of access to the Bangla validated version of the BDI-II. To mitigate bias, we translated the BDI-II into Bengali and conducted a pretest. Additionally, we were unable to assess whether the differences in prevalence observed between the two tools for measuring anxiety and depression are statistically significant. Finally, the study was conducted among women residing in purposively selected informal

settlements in Dhaka city, which means the findings may not be generalizable to all slums in Bangladesh.

5. Conclusion

In recent years, mental health has become a significant concern. The increasing rates of anxiety and depression have notably impacted the daily lives of individuals in informal settlements, particularly affecting women. To the best of our knowledge, this study is the first to evaluate mental health disorders, such as anxiety and depression, within this vulnerable demographic.

This research has explored the prevalence of these issues and revealed alarmingly high levels of anxiety and depression among ever-married women aged 18-64 years. Often, their mental health struggles go unrecognized, leaving their health needs unaddressed. The findings of this study indicate a substantial correlation between anxiety and both acute and chronic diseases, as well as a statistically significant association between depression and acute illness, highlighting how mental and physical health are interconnected.

Our findings suggest that greater attention should be directed towards the health of this population. This study is the first to investigate the consistency of scores between two anxiety and depression assessment tools in Bangladesh. It will empower researchers and medical professionals to more quickly determine which scale best meets their needs, allowing for the interchangeable use of these tools in appropriate contexts. The prevalence rates of anxiety and depression derived from the two tools are very similar, suggesting that they can be used interchangeably when specific conditions are not present. Moreover, these tools are consistently associated with factors such as age, marital status, religion, education, employment, acute illness, chronic illness, and known family mental health history. Therefore, in future studies seeking to measure the relationship between anxiety or depression and these types of variables, either of the tools can be selected. The study also suggests how different measures of assessing mental health disorders can be used in different contexts, such as informal settlements in complex urban health systems.

In conclusion, this study highlights the importance of improving mental health, especially for women in informal settlements who are disproportionately affected. Increased funding for mental health care and including mental health in primary health care facilities is essential. Facilities and services must be accessible to these women, allowing them to seek help easily and confidentially. Existing private mental health support groups need to come forward to meet the basic mental health needs.

7. Reference

- Altemus, M., Sarvaiya, N., & Neill Epperson, C. (2014). Sex differences in anxiety and depression clinical perspectives. *Frontiers in Neuroendocrinology*, 35(3), 320.
<https://doi.org/10.1016/J.YFRNE.2014.05.004>
- Angeles, G., Lance, P., Barden-O'Fallon, J., Islam, N., Mahbub, A. Q. M., & Nazem, N. I. (2009). The 2005 census and mapping of slums in Bangladesh: Design, select results and application. *International Journal of Health Geographics*, 8(1), 1–19. <https://doi.org/10.1186/1476-072X-8-32/TABLES/4>
- Annajigowda, H. H., Nirisha, L. P., Ganjekar, S., Rao, G. N., Gururaj, G., Varghese, M., & Benegal, V. (2023). Common mental disorders among women in reproductive age group: An analysis of national mental health survey, India 2016. *Indian Journal of Psychiatry*, 65(12), 1238.
https://doi.org/10.4103/INDIANJPSYCHIATRY.INDIANJPSYCHIATRY_832_23
- Arias, D., Saxena, S., & Verguet, S. (2022). Quantifying the global burden of mental disorders and their economic value. *EClinicalMedicine*, 54. <https://doi.org/10.1016/j.eclinm.2022.101675>
- Bangladesh - Demographic and Health Survey 2022*. (n.d.). Retrieved October 31, 2024, from <https://microdata.worldbank.org/index.php/catalog/6290>
- Bau, N., Khanna, G., Low, C., Shah, M., Sharmin, S., & Voena, A. (2022). Women's well-being during a pandemic and its containment. *Journal of Development Economics*, 156, 102839.
<https://doi.org/10.1016/J.JDEVECO.2022.102839>
- Baxter, A. J., Scott, K. M., Vos, T., & Whiteford, H. A. (2013). Global prevalence of anxiety disorders: a systematic review and meta-regression. *Psychological Medicine*, 43(5), 897–910.
<https://doi.org/10.1017/S003329171200147X>
- Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: psychometric properties. *Journal of Consulting and Clinical Psychology*, 56(6), 893–897.
<https://doi.org/10.1037//0022-006X.56.6.893>
- Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An Inventory for Measuring Depression. *Archives of General Psychiatry*, 4(6), 561–571.
<https://doi.org/10.1001/ARCHPSYC.1961.01710120031004>
- Bezerra, H. de S., Alves, R. M., Nunes, A. D. d., & Barbosa, I. R. (2021). Prevalence and Associated Factors of Common Mental Disorders in Women: A Systematic Review. *Public Health Reviews*, 42, 1604234. <https://doi.org/10.3389/PHRS.2021.1604234/FULL>
- Choi, S. W., Schalet, B., Cook, K. F., & Cella, D. (2014). Establishing a Common Metric for Depressive Symptoms: Linking the BDI-II, CES-D, and PHQ-9 to PROMIS Depression. *Psychological Assessment*, 26(2), 513. <https://doi.org/10.1037/A0035768>
- Cristóbal-Narváez, P., Haro, J. M., & Koyanagi, A. (2020). Perceived stress and depression in 45 low- and middle-income countries. *Journal of Affective Disorders*, 274, 799–805.
<https://doi.org/10.1016/J.JAD.2020.04.020>
- Fairbrother, N., Janssen, P., Antony, M. M., Tucker, E., & Young, A. H. (2016). Perinatal anxiety disorder prevalence and incidence. *Journal of Affective Disorders*, 200, 148–155.
<https://doi.org/10.1016/J.JAD.2015.12.082>

García-Batista, Z. E., Guerra-Peña, K., Cano-Vindel, A., Herrera-Martínez, S. X., & Medrano, L. A. (2018). Validity and reliability of the Beck Depression Inventory (BDI-II) in general and hospital population of Dominican Republic. *PLoS ONE*, 13(6), e0199750. <https://doi.org/10.1371/JOURNAL.PONE.0199750>

Giebel, C., Corcoran, R., Goodall, M., Campbell, N., Gabbay, M., Daras, K., Barr, B., Wilson, T., & Kullu, C. (2020). Do people living in disadvantaged circumstances receive different mental health treatments than those from less disadvantaged backgrounds? *BMC Public Health*, 20(1), 1–10. <https://doi.org/10.1186/S12889-020-08820-4/TABLES/3>

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH. (n.d.-a).

GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH. (n.d.-b).

Gruebner, O., Khan, M. M. H., Lautenbach, S., Müller, D., Krämer, A., Lakes, T., & Hostert, P. (2012). Mental health in the slums of Dhaka - A geoepidemiological study. *BMC Public Health*, 12(1), 1–14. <https://doi.org/10.1186/1471-2458-12-177/TABLES/5>

Hasan, M. T., Anwar, T., Christopher, E., Hossain, S., Hossain, M. M., Koly, K. N., Saif-Ur-Rahman, K. M., Ahmed, H. U., Arman, N., & Hossain, S. W. (2021a). The current state of mental healthcare in Bangladesh: part 1 – an updated country profile. *BJPsych International*, 18(4), 78. <https://doi.org/10.1192/BJI.2021.41>

Hasan, M. T., Anwar, T., Christopher, E., Hossain, S., Hossain, M. M., Koly, K. N., Saif-Ur-Rahman, K. M., Ahmed, H. U., Arman, N., & Hossain, S. W. (2021b). The current state of mental healthcare in Bangladesh: part 1 – an updated country profile. *BJPsych International*, 18(4), 78. <https://doi.org/10.1192/BJI.2021.41>

Hewitt, P. L., & Norton, G. R. (1993). The Beck Anxiety Inventory: A Psychometric Analysis. *Psychological Assessment*, 5(4), 408–412. <https://doi.org/10.1037/1040-3590.5.4.408>

Hijol, N. B. J., Salma, N., & Sarker, I. (2024a). Assessing the mental health of slum dwellers: an ordinal logistic approach. *Journal of Health, Population and Nutrition*, 43(1), 1–9. <https://doi.org/10.1186/S41043-024-00546-Y/TABLES/3>

Hijol, N. B. J., Salma, N., & Sarker, I. (2024b). Assessing the mental health of slum dwellers: an ordinal logistic approach. *Journal of Health, Population and Nutrition*, 43(1), 1–9. <https://doi.org/10.1186/S41043-024-00546-Y/TABLES/3>

HOUSEHOLD INCOME AND EXPENDITURE SURVEY HIES 2022 BANGLADESH BUREAU OF STATISTICS (BBS) STATISTICS AND INFORMATICS DIVISION (SID) MINISTRY OF PLANNING. (n.d.). Retrieved January 5, 2025, from www.bbs.gov.bd

Izutsu, T., Tsutsumi, A., Islam, A. M., Kato, S., Wakai, S., & Kurita, H. (2006). Mental health, quality of life, and nutritional status of adolescents in Dhaka, Bangladesh: Comparison between an urban slum and a non-slum area. *Social Science & Medicine*, 63(6), 1477–1488. <https://doi.org/10.1016/J.SOCSCIMED.2006.04.013>

Kiani, Z., Simbar, M., Hajian, S., & Zayeri, F. (2021). The prevalence of depression symptoms among infertile women: a systematic review and meta-analysis. *Fertility Research and Practice* 2021 7:1,

7(1), 1–10. <https://doi.org/10.1186/S40738-021-00098-3>

Koly, K. N., Khanam, M. I., Islam, M. S., Mahmood, S. S., Hanifi, S. M. A., Reidpath, D. D., Khatun, F., & Rasheed, S. (2021). Anxiety and Insomnia Among Urban Slum Dwellers in Bangladesh: The Role of COVID-19 and Its Associated Factors. *Frontiers in Psychiatry*, 12, 769048.

<https://doi.org/10.3389/FPSYT.2021.769048/BIBTEX>

Koly, K. N., Saba, J., Billah, M. A., McGirr, A., Sarker, T., Haque, M., Mustary, E., Hanifi, S. M. M. A., & Begum, F. (2023). Depressive symptoms and anxiety among women with a history of abortion living in urban slums of Bangladesh. *BMC Psychology*, 11(1), 1–10.

<https://doi.org/10.1186/S40359-023-01224-0/TABLES/3>

Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001a). The PHQ-9. *Journal of General Internal Medicine*, 16(9), 606–613. <https://doi.org/10.1046/J.1525-1497.2001.016009606.X>

Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001b). The PHQ-9: Validity of a Brief Depression Severity Measure. *Journal of General Internal Medicine*, 16(9), 606. <https://doi.org/10.1046/J.1525-1497.2001.016009606.X>

Kung, S., Alarcon, R. D., Williams, M. D., Poppe, K. A., Jo Moore, M., & Frye, M. A. (2013). Comparing the Beck Depression Inventory-II (BDI-II) and Patient Health Questionnaire (PHQ-9) depression measures in an integrated mood disorders practice. *Journal of Affective Disorders*, 145(3), 341–343. <https://doi.org/10.1016/J.JAD.2012.08.017>

McGrath, J. J., Al-Hamzawi, A., Alonso, J., Altwaijri, Y., Andrade, L. H., Bromet, E. J., Bruffaerts, R., de Almeida, J. M. C., Chardoul, S., Chiu, W. T., Degenhardt, L., Demler, O. V., Ferry, F., Gureje, O., Haro, J. M., Karam, E. G., Karam, G., Khaled, S. M., Kovess-Masfety, V., ... Zaslavsky, A. M. (2023). Age of onset and cumulative risk of mental disorders: a cross-national analysis of population surveys from 29 countries. *The Lancet Psychiatry*, 10(9), 668–681. [https://doi.org/10.1016/S2215-0366\(23\)00193-1](https://doi.org/10.1016/S2215-0366(23)00193-1)

Mental Health Is for Rich People. (n.d.). Retrieved November 1, 2024, from <https://www.vice.com/en/article/mental-health-is-for-rich-people/>

Merino-Soto, C., Angulo-Ramos, M., Rovira-Millán, L. V., & Rosario-Hernández, E. (2023). *Psychometric properties of the generalized anxiety disorder-7 (GAD-7) in a sample of workers*. <https://doi.org/10.3389/fpsy.2023.999242>

Moncrieff, J., Cooper, R. E., Stockmann, T., Amendola, S., Hengartner, M. P., & Horowitz, M. A. (2022). The serotonin theory of depression: a systematic umbrella review of the evidence. *Molecular Psychiatry* 2022 28:8, 28(8), 3243–3256. <https://doi.org/10.1038/s41380-022-01661-0>

Mostafa Alim, S. M. A. H., Ahmed, M. N., Mullick, M. S. I., Chowdhury, N. F., Akhter, F., & Alam, M. S. (2020). Validation of the Bangla version of Beck Depression Inventory-II. *Brain and Behavior*, 10(3), e01563. <https://doi.org/10.1002/BRB3.1563>

Naher, R., Rabby, M. R. A., & Sharif, F. (2021). Validation of patient health questionnaire-9 for assessing depression of adults in Bangladesh. *Dhaka University Journal of Biological Sciences*, 30(2), 275–281. <https://doi.org/10.3329/DUJBS.V30I2.54652>

Naved, R. T., Rimi, N. A., Jahan, S., & Lindmark, G. (2009). Paramedic-conducted Mental Health

- Counselling for Abused Women in Rural Bangladesh: An Evaluation from the Perspective of Participants. *Journal of Health, Population, and Nutrition*, 27(4), 477.
<https://doi.org/10.3329/JHPN.V27I4.3391>
- (PDF) *Adaptation of Beck Anxiety Inventory for Assessing Anxiety of Adults in Bangladesh*. (n.d.). Retrieved November 4, 2024, from
https://www.researchgate.net/publication/366740651_Adaptation_of_Beck_Anxiety_Inventory_for_Assessing_Anxiety_of_Adults_in_Bangladesh
- Perini, G., Ramusino, M. C., Sinforiani, E., Bernini, S., Petrachi, R., & Costa, A. (2019). Cognitive impairment in depression: recent advances and novel treatments. *Neuropsychiatric Disease and Treatment*, 15, 1249. <https://doi.org/10.2147/NDT.S199746>
- Rashid, S. F., Gani, S., Sarker, M., Rashid, S. F., Gani, S., & Sarker, • M. (2013). *Urban Poverty, Climate Change and Health Risks for Slum Dwellers in Bangladesh*. 51–70. https://doi.org/10.1007/978-4-431-54249-0_4
- Redwan, A., Karim, M. R., Royle, R. K. S., & Chowdhury, A. R. (2020). Validation of Bangla generalized anxiety disorder 7 scale among general population. *Bangladesh Journal of Psychiatry*, 34(1), 3–8. <https://doi.org/10.3329/BJPSY.V34I1.71969>
- Risal, A. (2011). Common mental disorders. *Kathmandu University Medical Journal (KUMJ)*, 9(35), 213– 217. <https://doi.org/10.3126/KUMJ.V9I3.6308>
- Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: the GAD-7. *Archives of Internal Medicine*, 166(10), 1092–1097. <https://doi.org/10.1001/ARCHINTE.166.10.1092>
- Stordal, E., Bjelland, I., Dahl, A. A., & Mykletun, A. (2003). Anxiety and depression in individuals with somatic health problems. The Nord-Trøndelag Health Study (HUNT). *Scandinavian Journal of Primary Health Care*, 21(3), 136–141. <https://doi.org/10.1080/02813430310002030>
- von Glischinski, M., von Brachel, R., & Hirschfeld, G. (2019). How depressed is “depressed”? A systematic review and diagnostic meta-analysis of optimal cut points for the Beck Depression Inventory revised (BDI-II). *Quality of Life Research : An International Journal of Quality of Life Aspects of Treatment, Care and Rehabilitation*, 28(5), 1111–1118. <https://doi.org/10.1007/S11136-018-2050-X>
- Wang, Y.-P., & Gorenstein, C. (2013). *Psychometric properties of the Beck Depression Inventory-II: a comprehensive review*. <https://doi.org/10.1590/1516-4446-2012-1048>
- Weobong, B., Weiss, H. A., Cameron, I. M., Kung, S., Patel, V., & Hollon, S. D. (2018). *Open Peer Review Measuring depression severity in global mental health: comparing the PHQ-9 and the BDI-II [version 1; peer review: 1 approved with reservations, 1 not approved]*. <https://doi.org/10.12688/wellcomeopenres.14978.1>
- Wilson, C. A., Bublitz, M., Chandra, P., Hanley, S., Honikman, S., Kittel-Schneider, S., Rückl, S. C. Z., Leahy Warren, P., & Byatt, N. (2024). A global perspective: Access to mental health care for perinatal populations. *Seminars in Perinatology*, 48(6), 151942. <https://doi.org/10.1016/J.SEMPERI.2024.151942>

Winter, S., Musyimi, C., Mutiso, V., & Ndeti, D. (2023). Depressive symptoms and associated social and environmental factors among women living in informal settlements in Nairobi, Kenya. *Global Public Health*, 18(1), 2200499. <https://doi.org/10.1080/17441692.2023.2200499>

World Mental Health Day 2023. (n.d.). Retrieved January 1, 2025, from <https://www.who.int/campaigns/world-mental-health-day/2023>

Zheng, F., Duan, Y., Li, J., Lai, L., Zhong, Z., Hu, M., & Ding, S. (2019). Somatic symptoms and their association with anxiety and depression in Chinese patients with cardiac neurosis. *The Journal of International Medical Research*, 47(10), 4920. <https://doi.org/10.1177/0300060519869711>

8. Annex

Table 3 Prevalence of Anxiety among the levels of GAD-7 and BAI

Categories GAD-7 BAI n (%) n (%)

Minimal Anxiety 129 (44.18) 119 (40.75) Mild Anxiety 110 (37.67) 84 (28.77)
Moderate Anxiety 37 (12.67) 36 (12.33) Severe Anxiety 16 (5.48) 53 (18.15)

Table 4 Prevalence of Depression among the levels of PHQ-9 and BDI-II

Categories PHQ-9 n (%)

BDI-II n (%)

Minimal Depression 109 (37.33) 146 (50.00) Mild Depression 111 (38.01) 45 (15.41)
Moderate Depression 51 (17.47) 51 (17.47) Moderately Severe
Depression 14 (4.79) N/A Severe Depression 7 (2.40) 50 (17.12)

Table 8 Adjusted ordinal logistic regression results for Anxiety (GAD-7 & BAI) and Depression (PHQ-9 & BDI-II) among ever-married adult women in Informal settlements.

39

OR (95% CI)	Age Variables	OR (95% CI)	GAD-7 BAI PHQ-9 BDI-II	
			OR (95% CI)	OR (95% CI)
18-23 Ref.	Ref.	Ref.	Ref.	Ref.
24-31 1.59 (0.75-3.39)	0.95 (0.45-2.01)			(0.54-3.55)
32-40 1.78 (0.82-3.85)				1.40 (.69-2.82)
40+ 1.56 (0.58-4.20)				1.44 (0.79-2.60)
Education	1.53 (0.84-2.78)	1.39		

1.80 (0.95-3.42)	1.16 (0.51-2.64)	1.43 (0.80-2.54)	1.42 (0.78-2.58)
No education Primary 0.71 (0.37-1.39)	Ref. Ref. Ref. Ref. (0.36-1.37)	0.54 (0.25-1.17)	(0.26-1.12) 0.40** (0.19-.83)
Secondary 0.57 (0.30-1.10) 0.70	0.64 (0.31-1.33)	0.57 (0.31-1.04) 0.54 (0.23-1.29)	0.62 (0.29-1.29) (0.19-1.11)
Higher Secondary and above	Employment 0.55	0.56 (0.24-1.30)	0.46
No Yes 0.98 (0.59-1.62)	Ref. Ref. Ref. Ref. 1.08 (0.69-1.70)	(0.50-1.32) 1.47 (0.90 2.40)	
Chronic Disease	0.81		
No Yes 2.41*** (1.43-4.05)	Ref. Ref. Ref. Ref. 2.74 *** (1.82-4.13) 1.68 (0.98-2.89)	1.76 (0.94-3.31)	
Acute Disease			
No Yes 1.90* (1.10-3.28)	Ref. Ref. Ref. Ref. (Monthly in BDT) 1.61** (1.10-2.35)	2.70*** (1.66- 4.39) 2.85*** (1.73-4.72)	
Family Income			
3000-18000 18000-25000 0.95 (0.53-1.69) 40	Ref. Ref. Ref. Ref. 1.12 (0.65-1.95)	1.10 (0.59-2.10)	0.98 (0.58-1.64)
25000-150000 0.65	1.06 (0.35-1.20)	(0.61-1.85)	0.95 0.87 (0.53-1.72) (0.46-1.63)

* p value <0.05 ** p value <0.01 *** p value <0.001

CODEBOOK

Measuring the Prevalence of Depression and Anxiety & Assessing Inter Tool Consistency: A Cross-Sectional Study Among the Women in Informal Settlements in Dhaka

Sl no	Description	Label	Field Name	Code/Remarks
	Question serial number		Id no	As recorded
			area_e	1. Shyampur 2. Dakshinkhan
q_a4	Household ID	HHID		
q_a1	Area	area	area	1. Shyampur 1 2. Dakshinkhan 2
q_b3	Gender	gender	gen	Male 1 Female 2
age	Age	age	age	18-23 1 24-31 2 32-40 3 40+ 4

--	--	--	--	--

q_b7	Marital Status	marital status	marital_status	Single/Unmarried (0) (dropped) Married (1) Widowed/Separated/Divorced 2
q_b8	Religion	religion	religion	Muslim (0) Non-muslim (1)
q_b13	Education	education	edu	No class passed/pre-schooling 0 Class 1 (1) Class 2 (2) Class 3 (3) Class 4 (4) Class 5 (5) Class 6 (6) Class 7 (7) Class 8 (8) Class 9 (9) Class 10 (10) SSC/Dakhil/Equivalent (11) HSC/Alim/Equivalent (12) Diploma/ vocational (13) BA/ BSc/BCom/Fazil/graduate/ BA (honours) (14) Post graduate/MA/Phd/Kamil (15) Hafezi/Qawmi/Kharizi (16) Medical (17) Engineering (18)

				Midwifery/Nursing (19) No class passed/ pre-schooling 0 Primary 1 Class 1 Class 2 Class 3 Class 4 Class 5 Hafezi/Qawmi/Kharizi Secondary 2 Class 6 Class 7 Class 8 Class 9 Class 10 Higher Secondary and above 3 SSC/Dakhil/Equivalent HSC/Alim/Equivalent Diploma/ vocational BA/ BSc/BCom/Fazil/graduate/ BA (honours) Postgraduate/MA/Phd/Kamil Medical Engineering Midwifery/Nursing
--	--	--	--	--

q_b14	Employment Status	employment	employment	Yes 1 No 0
-------	-------------------	------------	------------	---------------

43

q_e1	Chronic Disease	chronic disease	chronic_disease	Yes 1 No 0
q_e3	Acute Disease	acute disease	acute_disease	Yes 1 No 0
q_b16	Monthly Income	monthly income	income	Income_tertile (1) 3000-18000 Income_tertile (2) 18000-25000 Income_tertile (3) 25000-150000
q_e5	Have any of your family members ever faced any mental health conditions?	Known Family history	f_history	No (0) Yes (1) Don't know 2
	GAD-7			
q_f02	Feeling nervous, anxious, or on edge	nervous anxiety	gad_1	Not at all (0) Several days (1) More than half the days (2) Nearly every day (3)
q_f03	Not being able to stop or control worrying	control worry	gad_2	Not at all (0) Several days (1) More than half the days (2) Nearly every day (3)

q_f04	Worrying too much about different things	worry too much	gad_3	Not at all (0) Several days (1) More than half the days (2) Nearly every day (3)
q_f05	Trouble relaxing	trouble relaxing	gad_4	Not at all (0) Several days (1) More than half the days (2) Nearly every day (3)
q_f06	Being so restless that it is hard to sit still	restless	gad_5	Not at all (0) Several days (1) More than half the days (2) Nearly every day (3)

44

q_f07	Becoming easily annoyed or irritable	irritable	gad_6	Not at all (0) Several days (1) More than half the days (2) Nearly every day (3)
q_f08	Feeling afraid, as if something awful might happen	feeling afraid	gad_7	Not at all (0) Several days (1) More than half the days (2) Nearly every day (3)
q_f09	If you checked any problems, how difficult have they made it for you to do your work, take care of things at home, or get along with other people?		gad_8	Not difficult at all (0) Somewhat difficult (1) Very difficult (2) Extremely difficult (3)
	BAI			

q_f10	Numbness or tingling	Numbness or tingling	bai_1	Not at all (0) Mildly, but it didn't bother me much (1) Moderately- it wasn't pleasant at time(2) Severely- it bothered me a lot (3)
q_f11	Feeling hot	feeling hot	bai_2	Not at all (0) Mildly, but it didn't bother me much (Moderately- it wasn't pleasant at time Severely- it bothered me a lot (3)
q_f12	Wobbliness in legs	Wobbliness in legs	bai_3	Not at all (0) Mildly, but it didn't bother me much (Moderately- it wasn't pleasant at time Severely- it bothered me a lot (3)
q_f13	Unable to relax	unable to relax	bai_4	Not at all (0) Mildly, but it didn't bother me much (Moderately- it wasn't pleasant at time Severely- it bothered me a lot (3)
q_f14	Fear of worst happening	fear of worst happening	bai_5	Not at all (0) Mildly, but it didn't bother me much (Moderately- it wasn't pleasant at time Severely- it bothered me a lot (3)

q_f15	Dizzy or lightheaded	dizzy or lightheaded	bai_6	Not at all (0) Mildly, but it didn't bother me much (Moderately- it wasn't pleasant at time Severely- it bothered me a lot (3)
-------	----------------------	----------------------	-------	--

				pleasant at time Severely- it bothered me a lot (3)
q_f16	Heart pounding / racing	heart pounding/racing	bai_7	Not at all (0) Mildly, but it didn't bother me much (Moderately- it wasn't pleasant at time Severely- it bothered me a lot (3)
q_f17	Unsteady	unsteady	bai_8	Not at all (0) Mildly, but it didn't bother me much (Moderately- it wasn't pleasant at time Severely- it bothered me a lot (3)
q_f18	Terrified or afraid	terrified or afraid	bai_9	Not at all (0) Mildly, but it didn't bother me much (Moderately- it wasn't pleasant at time Severely- it bothered me a lot (3)
q_f19	Nervous	nervous	bai_10	Not at all (0) Mildly, but it didn't bother me much (Moderately- it wasn't pleasant at time Severely- it bothered me a lot (3)
q_f20	Feeling of choking	feeling of choking	bai_11	Not at all (0) Mildly, but it didn't bother me much (Moderately- it wasn't pleasant at time Severely- it bothered me a lot (3)
q_f21	Hands trembling	hands trembling	bai_12	Not at all (0) Mildly, but it didn't bother me much (Moderately- it wasn't pleasant at time Severely- it bothered me a lot (3)

				pleasant at time Severely- it bothered me a lot (3
q_f22	Shaky / unsteady	shaky/ unsteady	bai_13	Not at all (0) Mildly, but it didn't bother m much (Moderately- it wasn pleasant at time Severely- it bothered me a lot (3
q_f23	Fear of losing control	fear of losing control	bai_14	Not at all (0) Mildly, but it didn't bother m much (Moderately- it wasn pleasant at time Severely- it bothered me a lot (3
q_f24	Difficulty in breathing	difficulty in breathing	bai_15	Not at all (0) Mildly, but it didn't bother m much (Moderately- it wasn pleasant at time Severely- it bothered me a lot (3

q_f25	Fear of dying	fear of dying	bai_16	Not at all (0) Mildly, but it didn't bother m much (Moderately- it wasn pleasant at time Severely- it bothered me a lot (3
q_f26	Scared	scared	bai_17	Not at all (0) Mildly, but it didn't bother m much (Moderately- it wasn pleasant at time Severely- it bothered me a lot (3

q_f27	Indigestion	indigestion	bai_18	Not at all (0) Mildly, but it didn't bother me much (Moderately- it wasn't pleasant at times) Severely- it bothered me a lot (3)
q_f28	Faint / lightheaded	faint/ lightheaded	bai_19	Not at all (0) Mildly, but it didn't bother me much (Moderately- it wasn't pleasant at times) Severely- it bothered me a lot (3)
q_f29	Face flushed	face flushed	bai_20	Not at all (0) Mildly, but it didn't bother me much (Moderately- it wasn't pleasant at times) Severely- it bothered me a lot (3)
q_f30	Hot / cold sweats	hot/cold sweat	bai_21	Not at all (0) Mildly, but it didn't bother me much (Moderately- it wasn't pleasant at times) Severely- it bothered me a lot (3)
	PHQ-9			
q_f32	Little interest or pleasure in doing things	little interest	phq_1	Not at all (0) Several days (1) More than half the days (2) Nearly every day (3)
q_f33	Feeling down, depressed, or hopeless	feeling down	phq_2	Not at all (0) Several days (1) More than half the days (2) Nearly every day (3)

q_f34	Trouble falling or staying asleep, or sleeping too much	trouble sleep	phq_3	Not at all (0) Several days (1) More than half the days (2) Nearly every day (3)
q_f35	Feeling tired or having little energy	feeling tired	phq_4	Not at all (0) Several days (1) More than half the days (2) Nearly every day (3)
q_f36	Poor appetite or overeating	poor appetite	phq_5	Not at all (0) Several days (1) More than half the days (2) Nearly every day (3)
q_f37	Feeling bad about yourself or that you are a failure or have let yourself or your family down	feeling failure	phq_6	Not at all (0) Several days (1) More than half the days (2) Nearly every day (3)
q_f38	Trouble concentrating on things, such as reading the newspaper or watching television	trouble concentrating	phq_7	Not at all (0) Several days (1) More than half the days (2) Nearly every day (3)
q_f39	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	slow & fidgety	phq_8	Not at all (0) Several days (1) More than half the days (2) Nearly every day (3)
q_f40	Thoughts that you would be better off dead or of hurting yourself	thoughts of dying	phq_9	Not at all (0) Several days (1) More than half the days (2) Nearly every day (3)
q_f41	If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?	diff_work2		Not difficult at all (0) Somewhat difficult (1) Very difficult (2) Extremely difficult (3)

	BDI-2			
q_f42	1. Sadness	sadness	bdi_1	I do not feel sad (0) I feel sad much of the time (1)

48

				I am sad all the time (2) I am so sad or unhappy that I can't stand it (3)
q_f43	2. Pessimism	pessimism	bdi_2	I am not discouraged about my future (0) I feel more discouraged about my future than I used to (1) I do not expect things to work out for me (2) I feel my future is hopeless and will only get worse (3)
q_f44	3. Past Failure	past failure	bdi_3	I do not feel like a failure (0) I have failed more than I should have (1) As I look back, I see a lot of failures (2) I feel I am a total failure as a person (3)
q_f45	4. Loss of Pleasure	loss of pleasure	bdi_4	I get as much pleasure as I ever did from the things I enjoy (0) I don't enjoy things as much as I used to (1) I get very little pleasure from the things I used to enjoy (2) I can't get any pleasure from the things I used to enjoy (3)

q_f46	5. Guilty Feelings	guilty feeling	bdi_5	I don't feel particularly guilty (0) I feel guilty over many things I have done or should have done (1) I feel quite guilty most of the time (2) I feel guilty all of the time (3)
q_f47	6. Punishment Feelings	Punishment feeling	bdi_6	0. I don't feel I am being punished.

49

				1. I feel I may be punished. 2. I expect to be punished. 3. I feel I am being punished.
q_f48	7. Self-Dislike	self dislike	bdi_7	I feel the same about myself as ever (0) I have lost confidence in myself (1) I am disappointed in myself (2) I dislike myself (3)
q_f49	8. Self-Criticalness	self criticalness	bdi_8	I don't criticize or blame myself more than usual (0) I am more critical of myself than I used to be (1) I criticize myself for all of my faults (2) I blame myself for everything bad that happens (3)

q_f50	9. Suicidal Thoughts or Wishes	suicidal thoughts or wishes	bdi_9	I don't have any thoughts of killing myself (0) I have thoughts of killing myself, but I would not carry them out (1) I would like to kill myself (2) I would kill myself if I had the chance (3)
q_f51	10. Crying	crying	bdi_10	I don't cry anymore than I used to (0) I cry more than I used to (1) I cry over every little thing (2) I feel like crying, but I can't (3)

50

q_f52	11. Agitation	agitation	bdi_11	I am no more restless or wound up than usual (0) I feel more restless or wound up than usual (1) I am so restless or agitated, it's hard to stay still (2) I am so restless or agitated that I have to keep moving or doing something (3)
q_f53	12. Loss of Interest	loss of interest	bdi_12	I have not lost interest in other people or activities. (0) I am less interested in other people or things than before (1) I have lost most of my interest in other people or things (2) It's hard to get interested in anything (3)

q_f54	13. Indecisiveness	indecisiveness	bdi_13	I make decisions about as well as ever (0) I find it more difficult to make decisions than usual (1) I have much greater difficulty in making decisions than I used to (2) I have trouble making any decisions (3)
q_f55	14. Worthlessness	worthlessness	bdi_14	I do not feel I am worthless (0) I don't consider myself as worthwhile and useful as I used to (1) I feel more worthless as compared to others (2) I feel utterly worthless (3)
q_f56	15. Loss of Energy	loss of energy	bdi_15	I have as much energy as ever (0)

				I have less energy than I used to have (1) I don't have enough energy to do very much (2) I don't have enough energy to do anything (3)
--	--	--	--	--

q_f57	16. Changes in Sleeping Pattern	change in sleeping pattern	bdi_16	I have not experienced any change in my sleeping (0) I sleep somewhat more than usual (1) I sleep somewhat less than usual (2) 1 I sleep a lot more than usual (3) 2 I sleep a lot less than usual (4) 2 I sleep most of the day (5) 3 I wake up 1-2 hours early and can't get back to sleep (6) 3
q_f58	17. Irritability	irritability	bdi_17	I am not more irritable than usual (0) I am more irritable than usual (1) I am much more irritable than usual (2) I am irritable all the time (3)
q_f59	18. Changes in Appetite	changes in appetite	bdi_18	I have not experienced any change in my appetite (0) My appetite is somewhat less than usual (1) My appetite is somewhat greater than usual (2) 1 My appetite is much less than before (3) 2 My appetite is much greater than usual (4) 2 I have no appetite at all (5) 3

				I crave food all the time (6) 3
--	--	--	--	--

q_f60	19. Concentration Difficulty	concentration difficulty	bdi_19	I can concentrate as well as ever (0) I can't concentrate as well as usual (1) It's hard to keep my mind on anything for very long (2) I find I can't concentrate on anything (3)
q_f61	20. Tiredness or Fatigue	tiredness or fatigue	bdi_20	I am no more tired or fatigued than usual (0) I get more tired or fatigued more easily than usual (1) I am too tired or fatigued to do a lot of the things I used to do (2) I am too tired or fatigued to do most of the things I used to do (3)