



## Research article

## Mental health knowledge and awareness among university students in Bangladesh

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## ABSTRACT

Negative attitudes toward mental illness and treatment are attributed to a lack of or inaccurate mental health knowledge. We aimed to assess the current mental health knowledge and awareness among Bangladeshi university students and identified socio-demographic factors that affect them. Between February and April of 2021, a cross-sectional study of 2036 university students in Bangladesh was conducted. Two different questionnaires (i.e., knowledge and awareness) were developed to assess mental health knowledge and awareness. The two outcome variables in this study were mental health knowledge level and awareness level. The cut-off value was taken as 80% of the total scores of both the knowledge and awareness scales and divided into higher and lower groups. Data were analyzed using different descriptive statistical tools and binary logistic regression model. We found more than half (62.1%) of the students had higher knowledge, and 85.1% of the students had a higher awareness of mental health problems. Female students (OR 1.41, 95% confidence interval (CI): 1.15–1.72) and students managing their expenses by personal income and family support were significantly positively associated with the high knowledge of the mental health (OR 1.79, 95% CI: 1.40–2.29). Similarly, age (OR 1.47, 95% CI: 1.01–2.14) was significantly associated with high awareness. Good mental health was significantly negatively associated with the high knowledge (OR 0.72, 95% CI: 0.6–0.87) and positively associated with the high awareness (OR 1.48, 95% CI: 1.15–1.91). Although mental health awareness is high among Bangladeshi university students, knowledge of mental health is insufficient. As a result, it is essential to comprehend the gaps in knowledge and awareness of mental health disorders, as well as how they are addressed.

## 1. Introduction

The mental health of university students is becoming a growing problem throughout the world [1]. After graduating from higher secondary school (high school in some developed countries), students may encounter a variety of issues (e.g., dormitory life, study stress, lack of time management, unhealthy eating habits, sleeping disorders, smoking, problematic internet usage, and sedentary behavior) in their new academic setting [2]. During this period of transition, students struggle to deal with the intellectual and social obstacles of university studies, which is vital for their preparation for professional jobs through the development of professional knowledge and experience [3, 4, 5]. Even, the development of an autonomous personal life requires various psycho-social and

psychological adjustments for most undergraduate students [6]. Moreover, the university environment may possess a lot of surprises and sometimes can be unbearable and bring unexpected problems for some fresher students, and they may lack the psychological resilience to deal with such situations [3, 7].

As a result, after a given period, students may experience severe stress, anxiety, self-harm, including suicidal ideation or attempt, and so on. In recent years, for example, multiple mental health-related incidents (e.g., suicidal attempts or suicide) have taken place in several universities in Bangladesh [5]. Previous research has found that university students throughout the world, not only in Bangladesh, suffer from high rates of psychological morbidity, including depression and anxiety [8]. In Australia, poor mental health was found to be marginally connected to

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poor test performance and subsequent university dropout. Over 44% of overseas graduate university students said that they had had an emotional or stress-related problem that had a major impact on their well-being or academic performance [9]. A study conducted in Yogyakarta, Indonesia showed that one-third of university students, for example, suffer from a diagnosable mental illness, and 64% of those who dropped out of college did so because of a mental condition [10].

Around 70%–75% of adults have mental health issues, and mental illnesses begin in adolescence or early adulthood (12–25 years) [11]. It accounts for 13% of the worldwide burden of disease as assessed by disability-adjusted life years [7]. However, it is a little lower in Bangladesh (11.2%) [12]. According to Global Burden of Disease (GBD) 2017, Bangladesh has a 0.2% schizophrenia incidence, compared to 0.3% Asia and 0.3% worldwide. The estimations of epilepsy and bipolar disorder in Bangladesh are close to regional and worldwide figures [13]. Depression is more common in Bangladesh (2.8%) than in the rest of Southeast Asia (2.2%), particularly among women (3.6% vs 2.7%). In Bangladesh, women commit suicide at a greater rate than males (8.7 vs. 6.8) suicide deaths per 100,000 population. The prevalence estimates for schizophrenia and associated psychotic illnesses in the adult population from the Bangladesh household mental health survey were 1.0% and 6.7%, respectively, which is much higher than the estimation of GBD reports [14, 15]. As a result, mental diseases are one of the top ten priority health problems in Bangladesh, as recognized by the government of Bangladesh [16].

According to the research of adolescents, increasing awareness of mental diseases led to more empathy and sensitivity toward those with mental health problems [17]. Previous research, however, indicated that public attitudes regarding persons with mental illness had not changed over the last several decades [18, 19]. This might be due to a lack of mental health knowledge and awareness. For example, Abolfotouh's study with adults aged 18 or above in Saudi Arabia found that 87.5% of participants have lack mental health knowledge [20]. According to research conducted among students at an Indonesian university, 50.23% were knowledgeable about mental health [21]. Even among medical students, in their early years, a study identified significant knowledge and attitude inadequacies [22].

Insufficient knowledge and associated stigma affect mental health [23]. Moreover, lack of knowledge of psychiatric diseases may impact stigmatizing attitudes toward mental diseases [24] or create a barrier to the delivery of mental health care [25], while engagement with mentally ill persons may result in positive attitudes and enlightened perspectives. Due to insufficient knowledge, mental health problems are not often seen as a health issue, and they are rarely given the utmost attention in healthcare delivery. These problems are more prevalent in low and medium-income nations than economically developed ones [26]. It is shocking how common depression, anxiety, and stress symptoms are among university students.

In the US, national epidemiological research has found that over a half of college students tested to fit the criteria for mental disease, but only about a 1/4 sought treatment [27]. Another study found that almost 70%–80% of young adults do not get the treatment they need all over the world [27]. It indicates that undergraduate students' psychological morbidity is a neglected public health issue with important consequences [28]. As a result, undergraduate education is a crucial period in a student's life, and many people consider it crucial for creating systems and intervention approaches that can help prevent mental illnesses [8, 29].

This emphasizes the need for primary and secondary preventive strategies, as well as the creation of necessary and suitable support services for this particular group [8]. Therefore, mental health studies are required to identify the prevalence of mental health knowledge and awareness among university students to establish targeted initiatives to address such prevalences [11] and awareness through anti-stigma campaigns and public education via schools and the media are crucial [20, 22]. Although previously, one study by Nazim et al., conducted in a rural area of Bangladesh, investigated the level of awareness, knowledge, and help-seeking attitudes and behaviors among adults regarding mental health disorders [11]. However,

to the best of our knowledge, no study has been conducted in Bangladesh to assess overall mental health knowledge and awareness among university students. Thus, our objective is to evaluate mental health knowledge and awareness status among university students in Bangladesh and assess a variety of socio-demographic parameters that might affect them.

## 2. Methods

### 2.1. Study population, data source and sample size

We conducted a cross-sectional study of 2036 (1379 male and 657 female) university students of Bangladesh between February and April 2021. The optimum sample size for this cross-sectional study was calculated approximately 2036 by applying the following sample size formula for our study where  $P = 0.5$  was assumed as population proportion was unknown, and margin of error was set as 0.025.

$$S = Z^2 \times \frac{P(1 - P)}{d^2}$$

where.

S = Sample size.

Z = Z-score.

P = Population proportion (Assumed as 0.5).

d = Margin of error (0.02).

We collected data from five different schools of discipline, i.e., applied science, arts, business administration, life science, and physical science of 96 public and private universities in Bangladesh. Most university students in Bangladesh study in one of these five schools. As a result, we picked these schools for our study. Then students were selected from the schools according to the proportional allocation. Moreover, we excluded medical, public health, and psychology department students because they might learn necessary pieces of knowledge about mental health in their academic curriculum. We conducted an online questionnaire survey (Appendix-1). There are 155 universities in Bangladesh (52 public and 103 private universities) [30]. During the data collecting period, a strict lockdown was imposed all over the country due to the COVID-19 pandemic. Therefore, we conducted an online questionnaire survey (Appendix-1). The online questionnaire survey is convenient, cheaper, and time-saving [31, 32]. To ensure that our sample is representative of the population, we contacted students of all the universities in Bangladesh and requested them to fill up the questionnaire. After collecting our estimated sample size (2036), we found that the collected samples covered 96 universities (39 public and 57 private universities), which was approximately two-thirds of the total number of universities in Bangladesh and ensure the representativeness (Appendix 1).

### 2.2. Ethics approval and consent to participate

The study's aims and purposes were thoroughly explained to the respondents before the data collection and consent were taken from all participating students. Collected data was kept safe and participants' anonymity and data confidentiality were assured. The ethical clearance was approved by the Biostatistics Research Ethical Review Committee of the Department of Statistics, Shahjalal University of Science and Technology, Sylhet, Bangladesh (no. sta/2021/7/Mehran\_Ovi/02). It was carried out in compliance with the ethical codes stated in the 1964 Helsinki Declaration and its subsequent revisions. Moreover, respondents' concerns regarding the research were clarified, and misconceptions were resolved. Respondents were assured that their participation in the research was completely voluntary and that they might quit at any moment.

### 2.3. Study instruments

We had developed a four-section questionnaire to describe the demographic characteristics, knowledge, and awareness of mental health

among students in Bangladeshi universities and validated the questionnaire by two expert psychometricians. We have also used Goldberg's GHQ-12 (General Health Questionnaire) questionnaire items for assessing participants' mental health conditions [33, 34]. From earlier studies [21, 35, 36, 37, 38], twenty-four questions for assessing mental health knowledge and twelve questions for testing mental health awareness and seven questions for measuring belief towards mental health were employed. We collected the questionnaire items from those studies and validated the correct answers by checking them. The questions were designed to highlight a list of issues on an understanding of mental health knowledge concerning mental diseases and social stigma or other components impacting mental health (like ADHD, OCD, etc.). Students were able to understand the multiple components of mental health knowledge. Without some positive questions, especially "OCD (Obsessive Compulsive Disorder) is one of the psychological problems", "ADHD or lack of confidence is one of the psychological problems", "Children of mentally ill patients may also develop mental illness", "Psychological problems can develop during or after pregnancy", and one reverse-coded question ("Most mental disorders cannot be cured"), more than 80% of participants answered the remaining questions properly. It indicates satisfying mental health knowledge of university students in multidimensional perspectives.

Questionnaire items were slightly modified to use the appropriate language for the target population, and a translation to Bangla was added to each item. Participants were asked to respond to the statements on a five-point Likert scale as follows: strongly agree (=1), through neutral (=3), to strongly disagree (=5). A pilot study was conducted with 56 respondents to examine reliability. Then the finalized questionnaires were distributed among the participants. 2055 participants completed and submitted the questionnaire, of which 2036 were useable. The resultant pilot research data was not included. Some questions were constructed negatively for analytical reasons; their replies were reverse coded so that we could assess the overall mental health knowledge and awareness.

#### 2.4. Outcome variables

Each statement within the knowledge and awareness domains was graded on a scale of one to five. A higher score indicates a higher knowledge of mental health. The knowledge scale had a total possible score ranging from 24 to 120 points and the awareness scale from 12 to 60 points, respectively. Based on the total of these values, a knowledge and awareness score variable was created and used as an outcome variable. As the knowledge and awareness scores of the participants did not follow the normal distribution, the scores were categorized using the 80 percent cut-off score, which in this instance was 96 for knowledge and 48 for awareness. Similar cut-off values were taken in different previous studies [39, 40, 41]. Therefore, a score  $\geq 96$  indicates a higher level of knowledge, while a score  $< 96$  indicates a lower level of knowledge. Similarly,  $\geq 48$  scores in awareness indicate the higher awareness and  $< 48$  indicates the lower awareness, respectively.

#### 2.5. Explanatory variables

Through literature review, the socioeconomic variables, i.e. participants' gender, age [11, 21, 24], university type, academic year, sources of personal expenses, and mental well-being were included in this study. Participants' age was divided into two groups (17–22, and 23 years old or above). For university types, two general types were used for classification: public and private universities. The sources of expenses of the participants were factored in as personal income, support from family, and both. Mental health well-being was assessed using a 12-item version of the widely used General Health Questionnaire (GHQ-12), a self-administered assessment tool intended for use in mental health screening to identify the severity of a mental problem [33, 34].

#### 2.6. Statistical analysis

Descriptive statistics (e.g., frequencies, percentages, and means) were used to describe the demographic characteristics of the respondents. A binary logistic regression model was used to analyze the effects of socio-demographic and other variables on outcome variables, i.e., the degree of knowledge or awareness. The logistic regression results were used to determine 95% confidence intervals of the estimates. A p-value of less than 0.05 was regarded as significant. All analyses were performed using SPSS Version 25 (Chicago, IL), R version 4.0.3 and Microsoft Excel. We have found standardized Cronbach's alpha for checking the reliability of two scales, i.e., knowledge and awareness, at 0.77 and 0.85, respectively.

### 3. Result

#### 3.1. Demographic characteristics

The mean knowledge question scores for different demographic categories of the participants were shown in Table 1. A total of 2036 residents completed the questionnaires excluding 177 respondents from medical colleges with a response rate of 96.56% with a response rate of 95.1%, and their demographic characteristics were presented in (Table 1). Male students comprised the majority of participants (67.7%) and followed by female students (32.3%). The fourth year had the highest of participants (22.9%), while the fifth year had the lowest percentage (11.9%). The majority (83.4%) of students heard about mental health. More than half of the students heard about World Sleep Day and Suicide Prevention Day (51.2% and 52.2%, respectively).

Most of the respondents (61.64%) managed the expenses by support from family, while 17.7% of students managed by personal income and rest of the of students (20.63%) managed in both ways.

The data also represented that, applied science had the highest rate (41.66%) of participation among the other disciplines. Moreover, the majority of the students (78.8%) attended from public universities, and more than half of the students (62.8%) were less than 22 years old (Table 1).

Table 1. Demographic characteristics of participants.

Demographic characteristics	N (%)
Gender	
Female	657 (32.3)
Male	1379 (67.7)
Academic Year	
First Year	408 (20.0)
Second Year	464 (22.8)
Third Year	454 (22.3)
Fourth Year	467 (22.9)
Fifth Year or Masters	243 (11.9)
Sources of expenses	
Personal income	361 (17.7)
Support from family	1255 (61.6)
Personal income and support from family	420 (20.6)
Type of University	
Public	1605 (78.8)
Private	431 (21.2)
Age	
17–22 years	1279 (62.8)
>22 years	757 (37.2)
School of Discipline	
Applied Science	809 (41.66)
Arts	264 (13.59)
Business Administration	257 (13.23)
Life Science	110 (5.66)
Physical Science	502 (25.85)

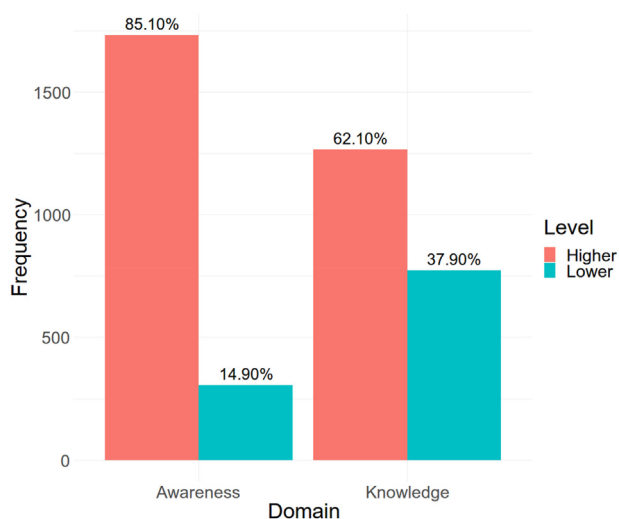


Figure 1. Knowledge and awareness status of the participants.

### 3.2. Knowledge about mental health

The correct response rate of the 24 items of knowledge questionnaire ranged from 31.83% to 96.56%, with a mean value of 32.1%. The computed knowledge score ranged from 0 to 24 and the mean (SD) value was 4.07 (0.79).

Figure 1 shows that a total of 62.1% of respondents have higher knowledge, and 85.1% have a higher awareness of mental illness.

Of the 24 questions, the items that were most likely to be answered correctly were item 19 to 24 ranging from 90.77% to 96.56%, with the highest percentage item 24 ‘Family member can help mentally sick

people” (96.56%); item 23, “Doing something enjoyable helps to improve mental health” (97.6%); item 22, “A person with depression feels very miserable” (94.45%); item 21, “Mentally ill patients do not mean always sad” (94%); item 20, “Middle-aged individuals are unlikely to develop psychological problems” (92.43%); item 19, “Because of bullying or abuse one can develop psychological problems\*” (90.67%). Items with the lowest correct response rates were item 1, “Children of mentally ill patients may also develop mental illness” (31.83%); item 2, “Most mental disorders cannot be cured\*” (67.14%) and item 3, “ADHD or lack of confidence is one of the psychological problems” (68.42%). The correct response rate of each item is presented in Table 2.

Table 2 shows descriptive statistics including the mean and standard deviation of knowledge items. Reading throughout the item 1 (“Children of mentally ill patients may also develop mental illness”), one can see that the average total score of 2.92 (out of 5) for the first question in Table 2 is less than one third (31.83%) of respondents strongly agreed with this item.

Figure 2 represents the overall frequency of the Likert scale responses of the respondents, and it comes up with the maximum number of “agree” responses as well as some “disagree” and “strongly disagree” responses.

Table 3 and Figure 3 shows the results of binary logistic regression analysis of participants' knowledge levels on mental health. Gender, mental health status and sources of personal expenses were significantly associated with the outcome variable (i.e., knowledge of the participants). Female students had 1.41 (95% CI: 1.153–1.722, P < 0.01) times and students having good mental health were 0.72 (95% CI: .60–.87, P < 0.01) times more knowledge than their counter parts. Moreover, students who managed their personal cost by personal income had 1.11 (95% CI: .87–1.42) times and students who managed their cost by both personal income and family assistantship had 1.79 (95% CI: 1.40 - 2.29, P < 0.01) times more knowledge than students who managed their cost by family

Table 2. Descriptive statistics of knowledge items.

Items (* = reverse coded)	Mean Score	Standard Deviation	% Of strongly agree/strongly disagree reversed (score = 5)	% Of Agree and Strongly Agree/reversed (score = 4,5)
Children of mentally ill patients may also develop mental illness	2.92	1.02	4.57	31.83
Most mental disorders cannot be cured *	3.67	0.98	17.19	67.14
ADHD or lack of confidence is one of the psychological problems	3.72	0.88	15.72	68.42
OCD (Obsessive Compulsive Disorder) is one of the psychological problems	3.86	0.80	19.70	71.42
Psychological problems can develop during or after pregnancy	3.91	0.73	18.86	76.08
One of the symptoms of depression is the loss of interest or pleasure in most things	3.94	0.76	20.83	78.84
A person with anxiety disorder may panic or try to avoid situations that she/he fears	4.00	0.71	21.46	80.94
Mental disorders don't affect people's feelings, behaviours, or thoughts *	4.03	0.99	34.04	82.86
People with mental disorders come from poor families *	4.11	0.90	36.35	82.96
Brain malfunctioning, or traumatic brain injury may cause the development of mental disorders	4.00	0.68	19.79	83.15
Persons with severe psychological or psychiatric problems often threaten others' safety	4.02	0.75	23.43	84.33
Drug addiction (i.e., heroine cocaine, marijuana etc.) or alcohol consumption may cause mental disorders	4.14	0.73	31.43	85.70
Talking over problems with someone helps to improve mental health	4.17	0.75	34.43	86.35
Mental disorders or psychological problems cannot be prevented *	4.14	0.80	32.61	86.54
Mental health is a component of health or like any other diseases	4.34	1.00	58.35	87.28
Suicidal behaviour or thinking or suicidal attempt is one of the psychological problems	4.21	0.80	38.56	88.07
Elderly individuals are unlikely to develop psychological problems *	4.24	0.78	39.64	88.56
Psychological problems or mental illness can start at a very early age	4.29	0.83	46.22	89.20
Because of bullying or abuse one can develop psychological problems	4.19	0.69	31.04	90.67
Middle-aged individuals are unlikely to develop psychological problems *	4.35	0.74	45.97	92.43
Mentally ill patients do not mean always sad	4.27	0.66	35.85	94.00
A person with depression feels very miserable	4.33	0.64	39.93	94.45
Doing something enjoyable helps to improve mental health	4.40	0.68	48.33	94.50
Family member can help mentally sick people	4.51	0.63	55.99	96.56

Here (\*) marked questions were reversely coded.

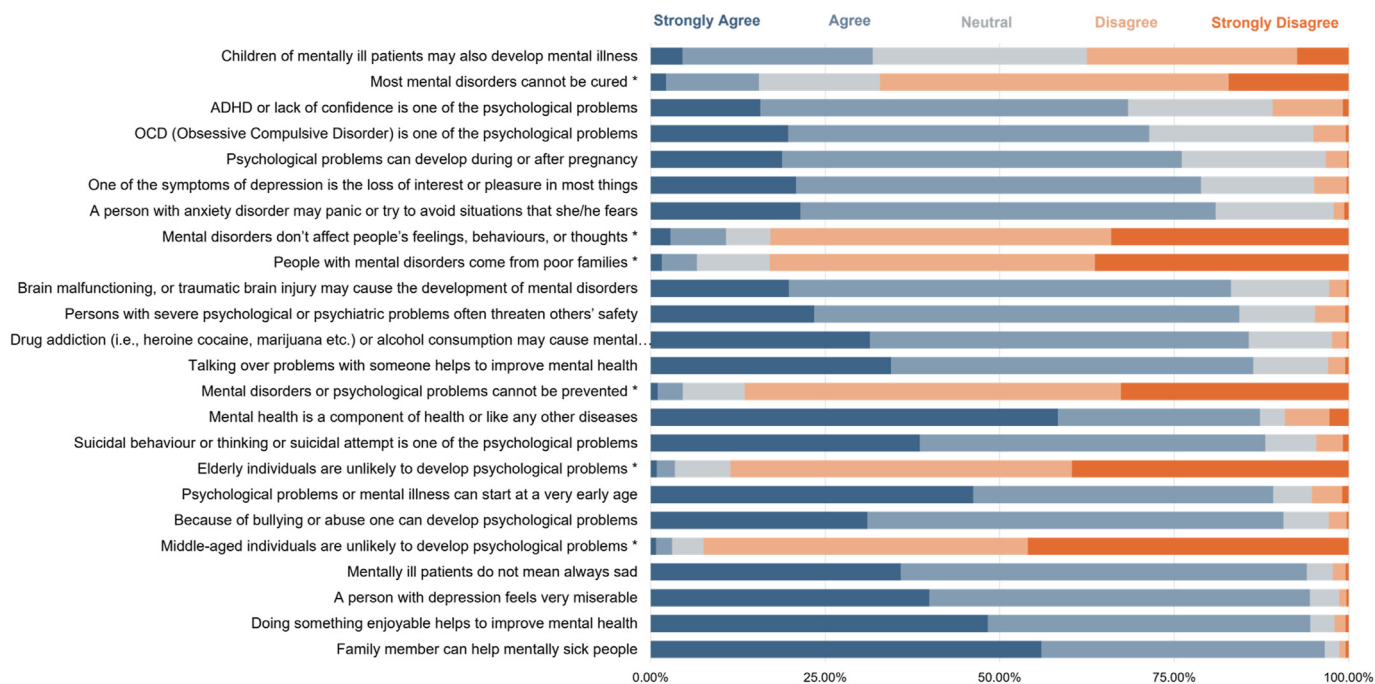


Figure 2. The Likert-scale responses of the respondents' mental health knowledge.

Table 3. Odds ratios and 95% confidence interval from binary logistic regression of knowledge about mental health.

Covariates	OR	95% CI of OR	p-value
<b>Gender</b>			.00
Male	1		
Female	1.41	1.15–1.72	
<b>Mental Health Status</b>			.00
Poor mental health	1		
Good mental health	.72	.60–.87	
<b>Age</b>			.42
17–22	1		
>22	1.12	.85–1.48	
<b>University type</b>			.63
Private	1		
Public	1.06	.84–1.32	
<b>Academic year</b>			.31
First Year	1		
Second Year	.95	.72–1.26	
Third Year	.86	.64–1.15	
Fourth Year	.78	.55–1.10	
Fifth Year or Masters	1.05	.69–1.61	
<b>Sources of personal expenses</b>			.00
Support from family	1		
Personal income	1.11	.87–1.42	
Personal income and support from family	1.79	1.40–2.29	

support only. Surprisingly, the OR for the participants with good mental health was lower than the reference category (i.e., poor mental health) with an odds ratio of 0.72 (95% CI: 0.60–0.87,  $P < 0.01$ ) and we found that there was a significant association between knowledge and good mental health. Students' age, academic year and university type were not significantly associated with their mental health knowledge.

### 3.3. Awareness about mental health

Table 4 provides a brief overview of the answers to the awareness question, which presents 12 questions defining mental health awareness.

The table summarizes the on-scale replies. The first item (“By coming into contact with or living with a mentally ill person, one becomes mentally ill.”) was a reversely coded question and had the lowest percentage of correct response (78.40%), and the last one (“If a friend of mine developed a mental disorder, I would offer her/him support”) had the highest percentage of correct response (98.20%). Although the first three items were ranging from 78.40% to 87.0%, the rest of the questions show above 93% correct response (“strongly agree”) rate. In particular, the last 6 items presented the strong bonding between friends and family, which is such a crucial factor in developing mental health awareness and all these items are presented in Table 4.

Figure 4 shows that the majority of the respondents had agreed with the awareness questionnaire items excluding the first item.

Table 5 and Figure 5 presents the results of binary logistic regression analysis of participants' awareness levels on mental health. Participants' age and mental health status were found significantly associated with the outcome variable (i.e., awareness level of the participants). Age >22 students were 1.47 (95% CI: 1.01 - 2.14,  $P < 0.05$ ) times more likely to be aware of mental health than age <22 students. Moreover, students with good mental health status were 1.48 (95% CI: 1.15–1.91,  $P < 0.01$ ) times more likely to be aware of mental health than students with poor mental health status. Gender, university type, academic year and sources of personal expenses were not found significant in Table 5. Participants' self-mental health status (i.e., good mental health status) was highly associated with their awareness level of mental health.

### 3.4. beliefs towards mental health

Table 6 describes the descriptive analysis of the self-belief section. It shows us some interesting results regarding our beliefs towards mental health. A majority of students voted that social and environmental pollution factor (74.9% and 52.9% respectively) are the main impactful causes of being affected by psychiatric problems.

Figure 6 comes up with some interesting outcomes about mental health beliefs.

Interestingly, almost a quarter of the students (32.8%) still think that bad luck or fate is the main cause of most psychological problems, 28.9% still have a belief in black magic or evil spirits and their effect on mental

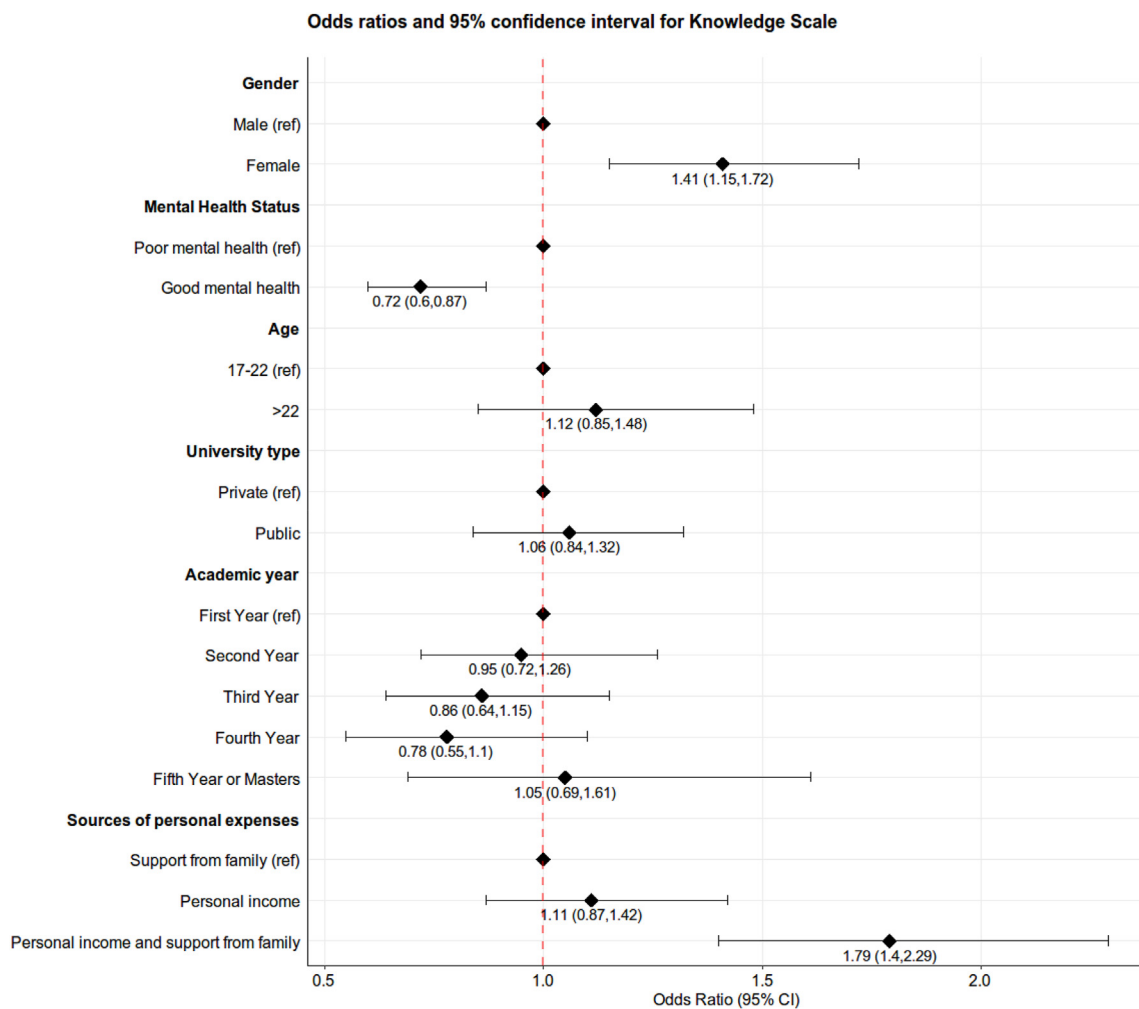


Figure 3. Forest plot representing the odds ratio and 95% confidence interval from binary logistic regression of knowledge about mental health.

Table 4. Descriptive analysis of Awareness questionnaire items.

Items (* = reverse coded)	Mean Score	Standard Deviation	% Of strongly agree/strongly disagree reversed (score = 5)	% Of Agree and Strongly Agree/reversed (score = 4,5)
By coming in contact with or living with mentally ill person, one become mentally ill *	3.94	1.02	33.60	74.50
People who are aware of their psychological problems are willing to seek professional help	3.93	0.91	28.00	74.70
If I had a mental disorder, I would seek my friends' help	4.03	0.85	30.00	78.90
If I had recognized that I have a mental disorder, I would seek my family's help or go to a psychiatrist	4.32	0.79	48.70	87.00
If a friend of mine developed a mental disorder, I would talk to his/her parents or teacher and encourage her/him to look for a psychologist	4.44	0.66	52.10	93.60
Family members should be aware for any harm caused by persons with psychological or psychiatric problems	4.33	0.61	39.10	94.60
In a regular interval family member or patient should keep contact with their psychiatrist	4.49	0.61	53.70	96.10
If someone has epilepsy, he should inform his family and friends.	4.52	0.59	56.00	96.90
If a friend of mine developed a mental disorder, I would listen to her/him without judging or criticizing	4.60	0.58	64.10	97.40
Everyone has responsibility for preventing suicides among persons with psychological or psychiatric problems	4.74	0.55	77.60	97.60
Family members should observe mentally sick persons whether they are taking medications properly help or go to a psychiatrist	4.57	0.56	59.50	97.60
If a friend of mine developed a mental disorder, I would offer her/him support	4.65	0.53	67.20	98.20

illness, 17.7% of students believe that marriage can cure mental illness, 19.1% of students think that depression is not a true mental disorder, and 12.2% students believe that mentally ill patients are the burden on the family or society.

Appropriate treatment for mental health patient had come up with the findings of mental health beliefs. Nearly 47.5% of students believe in modern psychiatric treatment, 41.6% students believe both in religious rituals and Modern psychiatric treatment. On the other hand, 7.3%



Figure 4. The Likert-scale responses of the respondent's mental health awareness.

Table 5. Odds ratios and 95% confidence interval from binary logistic regression of awareness about mental health.

Variable	OR	95% CI	p-value
<b>Gender</b>			.23
Male	1		
Female	1.18	.90–1.55	
<b>Mental Health Status</b>			.00
Poor mental health	1		
Good mental health	1.48	1.15–1.91	
<b>Age</b>			.04
17-22	1		
>22	1.47	1.01–2.14	
<b>University type</b>			.44
Private	1		
Public	.88	.65–1.21	
<b>Academic year</b>			.32
First Year	1		
Second Year	.83	.56–1.22	
Third Year	.78	.53–1.17	
Fourth Year	.62	.39–.99	
Fifth Year or Masters	.57	.33–1.02	
<b>Sources of personal expenses</b>			.10
Support from family	1		
Personal income	1.06	.76–1.48	
Personal income and support from family	1.45	1.04–2.03	

students believe religious rituals only. The rest of the items had tiny percentages, which were not as impactful as we expected (Table 7).

#### 4. Discussion

University students' mental health is a global public health concern [1]. Insufficient awareness and related stigma have a negative impact on mental health [23]. Furthermore, a lack of knowledge of psychiatric diseases may lead to stigmatizing mental illnesses [24] or hinder mental health care delivery [25]. Globally, mental health research has attracted researchers' attention, yet it is understudied in Bangladesh. There is a knowledge gap in Bangladesh since no research has been conducted on university students' mental health knowledge and awareness. Hence, the current study assessed the mental health knowledge and awareness of Bangladeshi university students.

According to our findings, more than one-third of the participants lacked mental health knowledge. This finding is consistent with the results of the study by Despande et al., who found that only 65.3% of students demonstrated adequate knowledge [42]. However, the situation was not as bad as compared in other countries. Puspitasari et al., for example, found that 49.65% of students at a public university in West Java, Indonesia had poor mental health knowledge [21]. Unfortunately, despite more than a century of organized psychiatry and revolutionary advances in the etiology and treatment of mental disorders, university students still lack knowledge about mental health, highlighting the importance of increased educational efforts to eliminate engrained myths and misconceptions.

Regarding mental health awareness, consistent with the previous study conducted in Delhi [43], we have also found that the majority of the participants (85.1%) had a higher level of awareness. Contrary to our findings, Uddin et al. found [11] that more than half of the respondents were not aware of any mental health conditions. That being said, the findings, based on the data from a Bangladeshi rural district, may not be truly representative of a national perspective. Moreover, our targeted population was only university students and that could be a reason for the variation.

Almost all the participants had a belief in modern psychiatric treatment. However, along with modern treatment, almost half of the total respondents also had a general faith in both religious rituals and modern psychiatric treatment. Participants believed that religion is a psychological and social component that can either be a strong healing resource or be closely linked to psychopathology, which is not uncommon. For example, according to empirical research, religion is one of the first resources individuals and their loved ones turn to when they experience severe disease [44]. This might be due to various reasons. In a European study, they found that religious rituals and practices provide compassion in stressful situations [45]. Another study found that, the more the religiousness the lower the mental illness [46]. However, a few alarmingly divergent opinions have emerged in numerous studies. A study taken in Novosibirsk, Bratislava, and Germany, for example, discovered that a high portion of the general population considered mental illness as a form of divine punishment for wrongdoings committed [47]. Furthermore, we found that almost one in every three participants believed in the impact of black magic or evil spiritual effects and had faith in the effect of bad luck on psychological problems. This finding is consistent with some studies [48]. A strong faith in this concept may lead to a rejection of established mental health treatment and a turn toward more indigenous and traditional healing approaches. Therefore, it is important

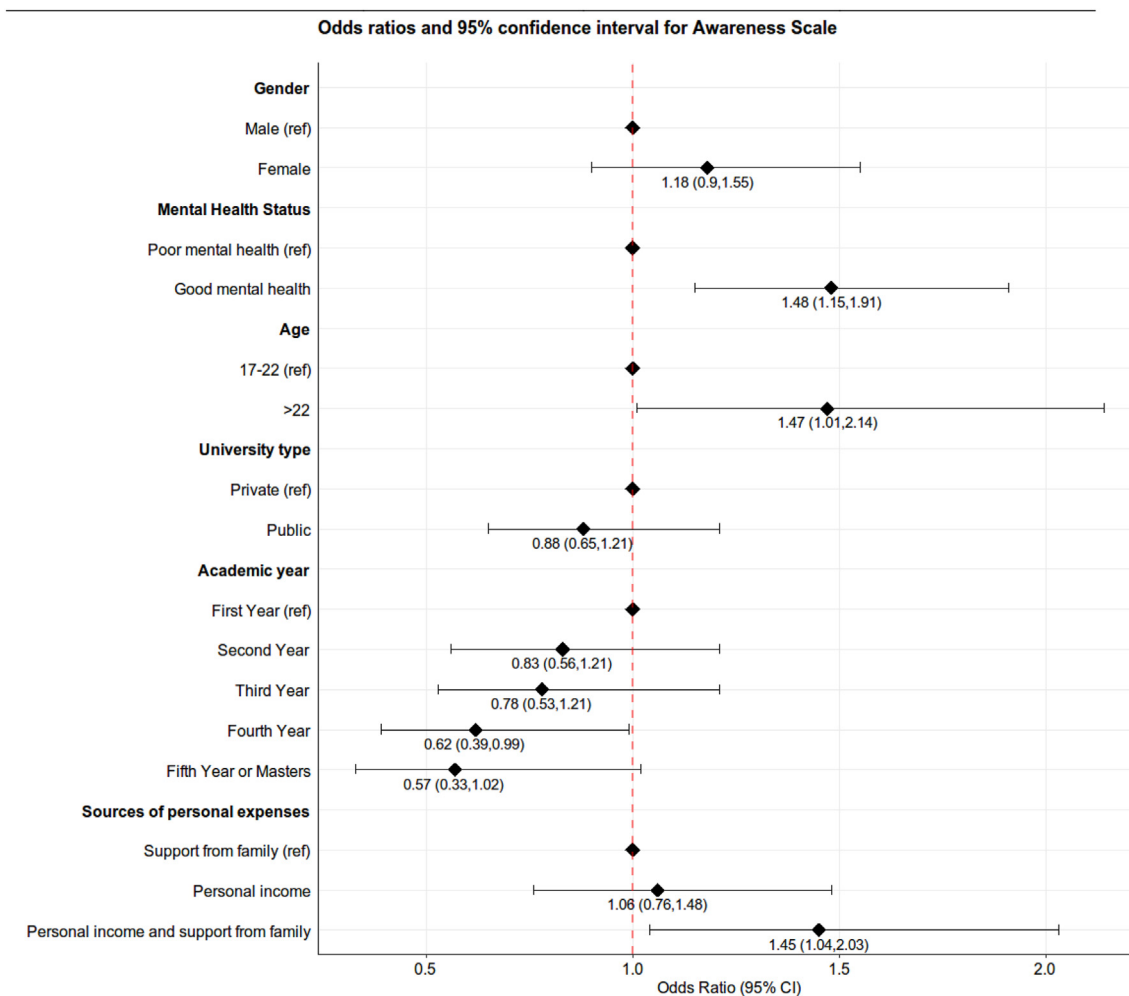


Figure 5. Forest plot representing the odds ratio and 95% confidence interval from binary logistic regression of awareness about mental health.

Table 6. Descriptive analysis of belief items.

Statement	Agree and Strongly Agree	Neutral	Disagree and Strongly Disagree
Marriage can cure mental illness	17.7	31.7	50.5
Bad luck/fate is the main cause of most psychological and psychiatric problems	32.8	27.0	40.2
Black magic or evil spirits or jinn might cause mental illness.	28.9	24.1	47
Social factors are the main cause of most psychological and psychiatric problems	74.9	19.4	5.8
Environment pollution and other factors may cause most psychological and psychiatric problems	52.9	31.6	15.5
Depression is not a true mental disorder	19.1	14.8	66
Persons with psychological or psychiatric problems are a burden on the family or society	12.2	15.0	72.9

to inquire into Bangladeshi faiths about the etiology and treatment of mental illness.

Furthermore, more than half of the students believed that environmental and social factors were the main causes of psychological problems (74.9% and 52.9%, respectively). These findings are in line with some studies. For example, death, divorce, break-up, changing schools, and the financial crisis have a significant relationship with poor mental health [49]. Similarly, prenatal exposure to viruses, poisons, alcohol, and/or drugs, nutritional inadequacies, chronic medical illnesses, presence of pollutants, high temperatures, and rural geographical location are examples of environmental factors that are liable for bad mental health [50, 51, 52].

In this research, age was significantly associated with knowledge ( $P < 0.05$ ) which is consistent with the other studies [21, 22, 24]. Those studies have shown that there is insufficient knowledge among varsity students about psychiatric illnesses in the early stages of education. It implies that the older the students are, the more they know about mental health.

Female respondents were more likely to be in the higher knowledge category than male respondents. Knowledge was also shown to be associated with mental health and the sources of personal expenses. Respondents who spent both family support and personal money on personal expenses were more likely to have a better level of knowledge than those who were dependent on complete family support. Usually,



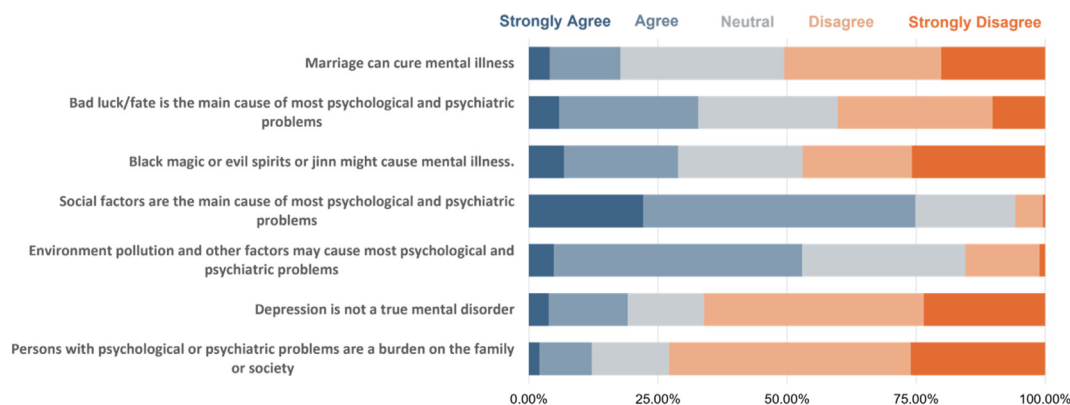


Figure 6. The Likert-scale responses of the respondents' belief about mental health.

Table 7. Appropriate treatment for mental health patient.

Treatment	Frequency (%)
Modern psychiatric treatment	967 (47.5)
Religious rituals and Modern psychiatric treatment	846 (41.6)
Religious rituals	148 (7.3)
*Others	75 (3.6)

\*Combinations of Religious rituals, Kabiraj, Unani, Hekemy, Homeopathy, Modern psychiatric treatment etc.

many students from middle-class families in Bangladesh get a chance to continue higher studies at the university level.

To improve university students' mental health understanding, it is vital to get insight into the gaps in perspectives, information, and awareness around mental health disorders to combat the complicated mental health of Bangladeshi university students, as well as their treatment procedure and how they are addressed. Students must be taught how to identify certain mental problems and how to respond effectively to them.

### 5. Conclusion

Despite of having awareness of mental health issues, the mental health knowledge of Bangladeshi university students is poor. Their low level of knowledge of mental illness prevents them from properly recognizing these problems and offering support. Female and students who are financially self-sufficient have more knowledge, whereas students over the age of 22 have more awareness. Both knowledge and awareness about mental health were influenced by the good mental health status of the respondents. Interestingly, a vital number of participants still believe in superstitious acts such as black magic or religious rituals rather than modern psychiatric treatment. The findings from this research will help researchers, academics, and students in Bangladesh develop new ways to tackle Bangladeshi university students' problematic mental health. Therefore, more efforts are required to raise awareness of mental health problem as well as more university-level intervention programs to educate the students on the proper attribution of mental diseases. As a result, educational initiatives may need to be group specific, with a focus on those who are female, younger, and underprivileged.

### 6. Strengths and limitations of the study

This is the first large study to evaluate knowledge and awareness of mental health among Bangladeshi university students. The data for this study came from a wide range of public and private universities in

Bangladesh. The few studies conducted among Bangladeshi university students have concentrated on a particular segment of mental health issues rather than on the broader topic of mental health. As far as we have studied, this is the first research among university students in Bangladesh that analyzes or compares the belief questionnaire items towards mental health. Our sample size (2036) was also comparatively larger than that of earlier studies in Bangladesh that focused on university-level students [53, 54]. Moreover, we found standardized Cronbach's alpha 0.77 and 0.85 respectively, which is quite high for assessing the reliability of two scales, namely knowledge and awareness. It revealed that the internal consistency of our questionnaire is quite good, which might contribute to the correct recognition of next items on the questionnaire. Despite its important findings, the research has several limitations. The study was a cross-sectional design, which prevented examination of the chronological sequence of mental health knowledge and awareness, and causal associations cannot be identified. Furthermore, we were unable to implement the appropriate sampling technique due to a number of unavoidable circumstances such as non-response, difficulties of reaching remote areas etc.

Another limitation is the absence of comparison between our questionnaire and other multidimensional scales designed to evaluate knowledge and awareness of mental health problems. Since psychometric testing is such a method which is dependent on sample [55], thus it is hard to compare the psychometric characteristics of the Bangladeshi version of the mental health knowledge and awareness questionnaire with the scales used in students outside of Bangladesh because our questionnaire was developed and used exclusively in Bangladesh. The feasibility and psychometric properties of the questionnaire might be compared to other measures in the same study in future research. However, the study's results may be useful for future Bangladeshi youth research or treatments.

### 7. Recommendations

Education is a powerful tool for increasing knowledge and decreasing negative views regarding mental health problems. Gaining insight into the gaps in views, knowledge, and awareness surrounding mental health problems and how they are managed is necessary to enhance university students' knowledge of their mental health. Thus, it is necessary to educate students on how to recognize specific mental disorders and, as a result, how to respond appropriately to them. Although, at present, there is no nationally recognized program to raise awareness among the public or university students, a multi-disciplinary working group comprised of representatives from government ministries, mental health organizations, and advocacy organizations collaborated to plan a National Mental Health Policy. The Working Group also created a National Mental Health Strategic Plan 2020–2030, intending to implement it over the next decade through 5-year action plans. The Policy and Plan demand for

mental health services to be integrated across all levels of the public health care system. Through the improvement of the current health care system, mental health programs will be incorporated into the primary health care system. Decentralization will be accomplished by providing mental health care to divisions, districts, and smaller administrative areas (Upazila or thana) in rural and urban regions [16]. It will be helpful to increase community awareness. Moreover, some non-governmental organizations (NGOs) are attempting to raise awareness about mental health by reducing stigma, raising awareness about mental disorders, and promoting mental health literacy. These groups use radio, television, print, and electronic media to spread their messages. Thus, the Bangladesh government should implement similar programs to increase awareness and ensure the required support. Similarly, educators, health workers, and academic institutions must implement health promotions regarding mental health problems and their treatment to remove misconceptions and enhance mental health care and treatment.

## Declarations

### Author contribution statement

Md. Abu Bakar Siddique; Musaddiqur Rahman Ovi; Tanvir Ahammed; Muhammad Abdul Baker Chowdhury; Md Jamal Uddin: Conceived and designed the experiments; Performed the experiments.

## Appendix-1

### Questionnaire Items

#### Knowledge Items

1. Children of mentally ill patients may also develop mental illness
2. Most mental disorders cannot be cured
3. ADHD or lack of confidence is one of the psychological problems
4. OCD (Obsessive Compulsive Disorder) is one of the psychological problems
5. Psychological problems can develop during or after pregnancy
6. One of the symptoms of depression is the loss of interest or pleasure in most things
7. A person with anxiety disorder may panic or try to avoid situations that she/he fears
8. Mental disorders don't affect people's feelings, behaviours, or thoughts
9. People with mental disorders come from poor families
10. Brain malfunctioning, or traumatic brain injury may cause the development of mental disorders
11. Persons with severe psychological or psychiatric problems often threaten others' safety
12. Drug addiction (i.e., heroine cocaine, marijuana etc.) or alcohol consumption may cause mental disorders
13. Talking over problems with someone helps to improve mental health
14. Mental disorders or psychological problems cannot be prevented
15. Mental health is a component of health or like any other diseases
16. Suicidal behaviour or thinking or suicidal attempt is one of the psychological problems
17. Elderly individuals are unlikely to develop psychological problems
18. Psychological problems or mental illness can start at a very early age
19. Because of bullying or abuse one can develop psychological problems
20. Middle-aged individuals are unlikely to develop psychological problems
21. Mentally ill patients do not mean always sad
22. A person with depression feels very miserable
23. Doing something enjoyable helps to improve mental health
24. Family member can help mentally sick people

Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

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### Data availability statement

Data may be available upon request to the corresponding author.

### Declaration of interest's statement

The authors declare no conflict of interest.

### Additional information

No additional information is available for this paper.

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## Awareness Items

1. By coming in contact with or living with mentally ill person, one become mentally ill
2. People who are aware of their psychological problems are willing to seek professional help
3. If I had a mental disorder, I would seek my friends' help
4. If I had recognized that I have a mental disorder I would seek my family's help or go to a psychiatrist
5. If a friend of mine developed a mental disorder, I would talk to his/her parents or teacher and encourage her/him to look for a psychologist
6. Family members should be aware for any harm caused by persons with psychological or psychiatric problems
7. In a regular interval family member or patient should keep contact with their psychiatrist
8. If someone has epilepsy, he should inform his family and friends.
9. If a friend of mine developed a mental disorder, I would listen to her/him without judging or criticizing
10. Everyone has responsibility for preventing suicides among persons with psychological or psychiatric problems
11. Family members should observe mentally sick persons whether they are taking medications properly help or go to a psychiatrist
12. If a friend of mine developed a mental disorder, I would offer her/him support

## Belief Items

1. Marriage can cure mental illness
2. Bad luck/fate is the main cause of most psychological and psychiatric problems
3. Black magic or evil spirits or jinn might cause mental illness.
4. Social factors are the main cause of most psychological and psychiatric problems
5. Environment pollution and other factors may cause most psychological and psychiatric problems
6. Depression is not a true mental disorder
7. Persons with psychological or psychiatric problems are a burden on the family or society

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