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Research article

Depression literacy and awareness programs among Bangladeshi students: An online survey

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ABSTRACT

Background: Preventing depression and helping individuals to become more resilient to depression, awareness-related programs have been suggested. To implement such programs, depression literacy (D-Lit) assessment is needed. However, little information is known about it in Bangladesh, and this gap was addressed - in the present study.

Methods: An online-based cross-sectional survey was carried out among 404 university students (62.6% male; 69.3% undergraduates, mean age = 22.35 ± 2.69 years). The survey included questions asking about socio-demographics, personal and family depression history, its' stigma and related programs, and the 20-item Bangla Depression Literacy questionnaire.

Results: The results showed a mean score of 9.30 (SD = 2.75; out of total 20 scores) on the Bangla D-Lit scale. Participants had very limited knowledge of the psychotic symptoms, impact, and management subscales. Moreover, nine items out of the total twenty-items were answered correctly by at least 50% of the participants. There were no significant D-Lit score differences based on gender and past-year personal history, and family depression history. Structural equation modeling indicated that having knowledge about depression and attending depression seminars were positively related to elevated depression literacy.

Limitations: The study has some limitations due to its cross-sectional study nature and modest sample size. In addition, there the assessment of depression did not use a validated psychometric instrument and the D-Lit comprises multiple-choice responses so the real rate of depression literacy may be even lower than that found because participants could have guessed answers that they did not know.

Conclusions: Findings from this study suggest that depression literacy was low in the population studied and the findings here will help to facilitate mental health literacy awareness programs in the context of Bangladeshi students as well as those outside the country.

1. Introduction

Mental Health Literacy (MHL) arises from the concept of health literacy that is concerned with mental health issues. MHL was first coined by Jorm and colleagues in 1997, which was later defined to be the knowledge and beliefs of mental disorders which help to recognize first aid, treatment seeking behavior, and other support (Jorm, 2020). Therefore, MHL is a very important aspect in enhancing the awareness, knowledge, and belief that facilitates the management and improvement of mental disorders' whereas poor MHL may increase the risk of mental health suffering (see Gabriel and Violato [2010] for a review). Consequently, MHL has been studied globally as a prerequisite to the implementation of mental health awareness programs and is reported to have had positive influences on minimizing such suffering (Gabriel and Violato, 2010). In Bangladesh (where the present study was carried out), there has been a gradual improvement in health and education, but in the case of health literacy, it has been disappointing (Arafat et al., 2018a).

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Depression is the second most burdensome disease globally and affects more than 300 million people worldwide (World Health Organization [WHO], 2017). The common features included in depression are mood disturbance, lack of pleasure, sleep problems, weight changes, feelings of guilt, attention and concentration impairment, impairment of the daily functioning, and in extreme cases, suicide (Disu et al., 2019; Mamun et al., 2019a; WHO, 2017). Students in Bangladesh are highly prone to suffer from depression (i.e., the rate is more than 50%; e.g., Alim et al., 2017; Bhuiyan et al., 2020; Hossain et al., 2019; Mamun and Griffiths, 2019; Mamun et al., 2019b, 2019c; 2019d; Sakib et al., 2020). Furthermore, common mental disorders (such as depression, traumatic disorder) are reported to be suicidality risk factor (Jahan et al., 2020; Mamun and Griffiths, 2020a, 2020b; Sakib et al., 2020). These disorders directly or indirectly account for 90% of suicidality and suicides (Mamun and Griffiths, 2020c, 2020d; Mamun and Ullah, 2020); whereas up to 60% of individuals with suicide ideation are depressed in Bangladesh (Arafat et al., 2018b).

Although the extreme severity of mental disorders is well established, there are still stigmas in many societies like Bangladesh; therefore, individuals find it difficult to seek professional treatment (Masud et al., 2020). In this regard, programs that raise awareness and promote health education are needed to help to reduce the stigma as well as make this vulnerable cohort more self-resilient to mental health suffering (Mamun et al., 2019b; Griffiths et al., 2004; WHO, 2017). At present, the implementation of mental health promotion programs and MHL assessment is inadequate and still has been addressed as a neglected issue in the country (i.e., only four previous studies have assessed MHL; i.e., Arafat et al., 2018a, 2019; Bhuiyan et al., 2020; Mali et al., 2018). Consequently, there is a huge knowledge gap concerning MHL generally and depression literacy specifically. Moreover, there is a lack of data on whether having personal experience of depression impacts depression literacy, although it is expected that individuals exposed to depression will have higher literacy (Lincoln et al., 2006; Maneze et al., 2016). Similarly, attending depression or mental health-related seminars, workshops, or other programs are likely to positively influence depression literacy (Ruble et al., 2013; Yap and Jorm, 2012). These issues have not been investigated in the context of Bangladesh to date. Therefore, the present study examined depression literacy in relation to basic socio-demographic factors (i.e., gender, marital status, education level, residence, etc.).

2. Methods

2.1. Participants, procedure, and ethics

A cross-sectional survey study was conducted via online platforms (e.g., Facebook pages, groups, etc.) from February 1 to March 15, 2020, after ensuring that the selected participants were all students (either undergraduate or postgraduate). An online survey was utilized in this study because of its advantages in epidemiological studies (increased confidentiality and anonymity, larger response rates, increased honesty of responses, etc.; Van Gelder et al., 2010). After clicking on the survey link, the participants were able to begin the online survey once they had given their informed consent, and had read statements following the Helsinki Declaration 1975. The study was approved by the local institutional review board. Approximately 500 students were approached via social media platforms to participate in the study, and 428 students began the survey. Of these, 24 participants did not complete the full survey, therefore, a total of 404 respondents' data were selected for final analysis.

2.2. Measures

2.2.1. Sociodemographic variables

The first part of the survey included questions concerning socio-demographic variables (i.e., age, gender, study status, study area). Two types of students (i.e., undergraduate and postgraduate) were approached, who were recruited from several study areas including basic sciences, business studies, social sciences, biological sciences, medical sciences, and allied medical sciences.

2.2.2. Depression-related variables

The survey also included questions on whether the participant had experienced depression over the past year (yes/no), and whether anyone in their family had experienced depression over the past year (yes/no). One question relating to depression stigma were also asked (i.e., 'depression is like other physical illnesses'). Participants were asked if they had heard about any seminars, workshops, or other programs related to depression or mental health during the past year (from friends, social media, etc.) and if they had attended any such events.

2.2.3. Depression literacy

In the present study, depression literacy based on symptomatology (i.e., biological, cognitive, behavioral, and psychotic symptoms), impacts, and management, was assessed using the Bangla version of the Depression Literacy Scale (Bangla D-Lit; Arafat et al., 2017). Although the original version comprised 22 items (Griffiths et al., 2004), the Bangla D-Lit has only 20 items. Each item has three response options (i.e., 'true', 'false', and 'don't know'), and one point is awarded for each correct response (whereas '0' is given for incorrect and 'don't know' responses). Based on this scoring, the scale has a score range of 0–20, where higher scores indicate having higher depression literacy. Previously, the scale has demonstrated acceptable reliability (Cronbach's alpha = 0.77; Arafat et al., 2017). Cronbach's alpha in the present study was good (0.77).

2.3. Statistical analysis

The data were analyzed using IBM Statistical Package for Social Sciences (SPSS) version 25.0. Descriptive statistics such as frequency and percentage were used along with the ANOVA tests to test for D-Lit mean differences with the variables. The level of statistical significance was $p < 0.01$ for all tests. Frequency and descriptive statistics were used to determine mean scores and standard deviations of the study variables. A Pearson correlation test was utilized to determine correlation coefficients among the study variables. Structural equation modeling was applied to identify the associations among the study variables. The direct effects of the independent and control variables on the outcome variable were calculated via using the bootstrapping method with 95% bias-corrected confidence intervals and 10,000 bootstrap samples. The tested model was evaluated using the goodness of fit criteria. Accordingly, root mean square residuals (RMSEA) and standardized root mean square residuals (SRMR) should be below 0.05, and comparative fit index (CFI) and goodness of fit index (GFI) should be above 0.95 for a good fit. RMSEA and SRMR lower than 0.08, and CFI and GFI higher than 0.90 are thresholds for acceptable fit (Hu and Bentler, 1999).

3. Results

The distribution of socio-demographics is reported in Table 1. Most of the participants were males (62.6%; n = 253) and were undergraduate students (69.3%; n = 280) with a mean age of 22.35 years (SD = 2.69). Approximately three-quarters of the participants (73.8%; n = 298) reported themselves as having experienced depression during the past year, and 55.9% reported that at least one family member had depression in the past year. Nearly two-thirds of participants (62.1%) reported that depression was just like other physical illnesses. Although more than half of the participants (52%, n = 210) had heard about mental health-related programs (i.e., seminars, symposia, workshops, etc.) in the past year, only 17.6% had attended such programs (n = 71).

The mean total Bangla D-Lit score was 9.30 out of 20 (SD = 2.75; see Table 1). There was no significant gender difference on overall D-Lit scale score as well as other subscales, except for biological symptoms (i.e.,

Table 1. Comparison on Bangla D-Lit overall and subscales scores across socio-demographics.

Variables	Depression literacy (mean ± SD)						
	D-Lit overall	*Biological symptoms*	*Cognitive symptoms*	*Behavioral symptoms*	*Psychotic symptoms*	*Impact of depression*	*Management of depression*
Overall Mean ± SD	9.30 ± 2.75	1.56 ± 0.68	2.48 ± 0.70	0.86 ± 0.34	0.41 ± 0.79	1.79 ± 0.83	2.19 ± 1.59
Gender							
Female (151; 37.4%)	9.33 ± 2.82	1.68 ± 0.57**	2.49 ± 0.65	0.89 ± 0.30	0.44 ± 0.87	1.78 ± 0.86	2.03 ± 1.57
Male (253; 62.6%)	9.28 ± 2.72	1.48 ± 0.73	2.47 ± 0.73	0.84 ± 0.36	0.39 ± 73	1.81 ± 0.81	2.28 ± 1.60
Type of student							
Undergraduate (280; 69.3%)	8.91 ± 2.57**	1.489 ± 0.69**	2.50 ± 0.69	0.85 ± 0.35	0.36 ± 0.73	1.73 ± 0.81*	1.96 ± 1.46**
Postgraduate (117; 29.0%)	10.20 ± 2.99	1.71 ± 0.55	2.41 ± 0.73	0.87 ± 0.33	0.52 ± 0.90	1.94 ± 0.86	2.74 ± 1.79
Discipline area of university study							
Basic sciences (54; 13.4%)	9.15 ± 2.73**	1.44 ± 0.72*	2.57 ± 0.63	0.83 ± 0.37	0.43 ± 0.74*	1.76 ± 0.86*	2.11 ± 1.59**
Business studies (18; 4.5%)	8.38 ± 2.35	1.39 ± 0.77	2.61 ± 0.50	0.78 ± 0.42	0.44 ± 0.92	1.50 ± 0.71	1.66 ± 1.23
Social sciences (145; 35.9%)	8.91 ± 2.73	1.49 ± 0.75	2.41 ± 0.74	0.84 ± 0.36	0.30 ± 0.64	1.77 ± 0.82	2.08 ± 1.60
Biological sciences (124; 30.7%)	9.44 ± 2.71	1.64 ± 0.60	2.48 ± 0.72	0.87 ± 0.34	0.58 ± 0.92	1.76 ± 0.84	2.11 ± 1.61
Allied-health sciences (19; 4.7%)	10.05 ± 2.41	1.89 ± 0.31	2.47 ± 0.61	0.84 ± 0.37	0.21 ± 0.53	1.84 ± 0.83	2.79 ± 1.51
Medical sciences (28; 6.9 %)	11.10 ± 3.25	1.75 ± 0.58	2.57 ± 0.69	0.96 ± 0.18	0.25 ± 0.70	2.28 ± 0.85	3.28 ± 1.69
Self-rated past-year depression (personal)							
Yes (298; 73.8%)	9.35 ± 2.62	1.60 ± 0.67	2.51 ± 0.65	0.88 ± 0.32*	0.45 ± 0.81	1.76 ± 0.81	2.14 ± 1.56
No (106; 26.2%)	9.18 ± 3.09	1.43 ± 0.69	2.40 ± 0.82	0.80 ± 0.40	0.30 ± 0.69	1.89 ± 0.89	2.34 ± 1.70
Self-rated past-year depression (at least one family member)							
Yes (226; 55.9%)	9.44 ± 2.60	1.61 ± 0.64	2.52 ± 0.65	0.84 ± 0.36	0.41 ± 0.77	1.83 ± 0.82	2.23 ± 1.65
No (178; 44.1%)	9.13 ± 2.93	1.50 ± 0.73	2.43 ± 0.75	0.88 ± 0.31	0.41 ± 0.79	1.76 ± 0.84	2.14 ± 1.53
I think depression is an illness like other physical illnesses							
Yes (251; 62.1%)	9.36 ± 2.77	1.62 ± 0.63*	2.52 ± 0.67	0.87 ± 0.33	0.35 ± 0.76*	1.85 ± 0.82	2.14 ± 1.57
No (153; 37.9%)	9.20 ± 2.72	1.45 ± 0.74	2.41 ± 0.73	0.84 ± 0.36	0.51 ± 0.81	1.71 ± 0.83	2.26 ± 1.64
Did you hear about any seminars, workshops, or other programs (from friends, social media, etc.) related to depression or mental health during the past year?							
Yes (210; 52.0%)	9.82 ± 2.57**	1.66 ± 0.59**	2.51 ± 0.69	0.87 ± 0.33	0.44 ± 0.82	1.86 ± 0.80	2.47 ± 1.60**
No (194; 48.0%)	8.75 ± 2.84	1.45 ± 0.75	2.45 ± 0.71	0.84 ± 0.36	0.38 ± 0.74	1.73 ± 0.85	1.88 ± 1.54
Did you attend any seminars, workshops, or other programs related to depression or mental health during the past year?							
Yes (71; 17.6%)	10.61 ± 2.72**	1.72 ± 0.56*	0.91 ± 0.28	0.91 ± 0.28	0.51 ± 0.91	2.14 ± 0.81**	2.84 ± 1.80**
No (333; 82.4%)	9.02 ± 2.68	1.52 ± 0.70	0.84 ± 0.35	0.85 ± 0.75	0.39 ± 0.75	1.73 ± 0.81	2.05 ± 1.52

*$p < 0.01$; **$p < 0.001$.

Table 2. Distribution of Bangla D-Lit item responses.

Variables	True; *n* (%)	False; *n* (%)	Don't know; *n* (%)
Biological symptoms			
Q6. Sleeping too much or too little may be a sign of depression. (True)	**340; 84.2%**	16; 4.0%	48; 11.9%
Q7. Eating too much or losing interes1t in food may be a sign of depression. (True)	**290; 71.8%**	43; 10.6%	71; 17.6%
Cognitive symptoms			
Q2. People with depression may feel guilty when they are not at fault. (True)	**349; 86.4%**	20; 5.0%	35; 8.7%
Q4. Loss of confidence and poor self-esteem may be a symptom of depression. (True)	**370; 91.6%**	9; 2.2%	25; 6.2%
Q8. Depression does not affect your memory and concentration. (False)	100; 24.8%	**284; 70.2%**	20; 5.0%
Behavioral symptoms			
Q9. People may move more slowly or become agitated as a result of their depression. (True)	**348; 86.1%**	13; 3.2%	43; 10.6%
Psychotic symptoms			
Q1. People speak in a rambling and disjointed way. (False)	124; 30.7%	**65; 16.1%**	215; 53.2%
Q3. Reckless and foolhardy behavior is a common sign of depression. (False)	318; 78.7%	**33; 8.2%**	53; 13.1%
Q5. People with depression often hear voices that are not there. (False)	127; 31.4%	**68; 16.8%**	209; 51.7%
Impact of depression			
Q11. Moderate depression disrupts a person's life as much as multiple sclerosis or deafness. (True)	**150; 37.1%**	43; 10.6%	211; 52.2%
Q12. Most people with depression need to be hospitalized. (False)	26; 6.4%	**260; 64.4%**	118; 29.2%
Q13. Many famous people have suffered from depression. (True)	**317; 78.5%**	4; 1.0%	83; 30.5%
Management of depression			
Q10. Clinical psychologists can prescribe antidepressants. (False)	162; 40.1%	**95; 23.5%**	147; 36.4%
Q14. Many treatments for depression are more effective than antidepressants. (False)	188; 46.5%	**22; 5.4%**	194; 48.0%
Q15. Cognitive behavioral therapy is as effective as antidepressants for mild to moderate depression. (True)	**245; 60.6%**	16; 4.0%	143; 35.4%
Q16. Of all the alternative and lifestyle treatments for depression, vitamins are likely to be the most helpful. (False)	116; 28.7%	**54; 13.4%**	234; 57.9%
Q17. People with depression should stop taking antidepressants as soon as they feel better. (False)	80; 19.8%	**96; 23.8%**	228; 56.4%
Q18. Antidepressants are addictive. (False)	92; 22.8%	**86; 21.3%**	226; 55.59%
Q19. Antidepressant medications usually work straight away. (False)	50; 12.4%	**123; 30.4%**	231; 57.2%
Q20. All antidepressants having sedative property which impairs day time activity. (True)	**164; 40.6%**	23; 5.7%	217; 53.7%

Note: Correct responses are those that have been emboldened.

females reported higher literacy; 1.68 ± 0.57 vs. 1.48 ± 0.73; $f = 8.834$, $p < 0.001$). Postgraduate students were more likely to have higher literacy in overall score (10.20 ± 2.99 vs. 8.91 ± 2.57, $f = 18.813$, $p < 0.001$) as well as other subscales of the of D-Lit including biological symptoms (1.71 ± 0.55 vs. 1.489 ± 0.69, $f = 9.486$, $p < 0.001$), the impact of depression (1.94 ± 0.86 vs. 1.73 ± 0.81, $f = 4.862$, $p < 0.01$) and management of depression (2.74 ± 1.79 vs. 1.96 ± 1.46, $f = 20.662$, $p < 0.001$) compared to undergraduate students. Findings also indicated that students studying in health-related disciplines had higher depression literacy levels compared to students studying non-health-related disciplines. Additionally, there were no significant differences in depression literacy scores between those who reported that they had experienced depression in the past year or those that reported at least one family member had experienced depression in the past year (compared to those who had not experienced depression or did not have family members with depression). Moreover, the stigma-related issue (i.e., 'depression is like other physical illnesses') was also not significantly associated with literacy scores (Table 1).

The participants who had heard about depression or mental health-related programs during the past year had higher overall depression literacy (9.82 ± 2.57 vs. 8.75 ± 2.84, $f = 15.825$, $p < 0.001$) as well as knowledge concerning biological symptoms (1.66 ± 0.59 vs. 1.45 ± 0.75,

Table 3. Mean scores, standard deviations, and Pearson's correlations of the study variables.

	1	2	3	4	5	6	7	8	9	10	11	12
1. Depression literacy	-											
2. Biological	.44***	-										
3. Cognitive	.40***	.18***	-									
4. Psychotic	.36***	.30***	.17***	-								
5. Behavior	.41***	-.02	.02	.01	-							
6. Impact	.61***	.15**	.12*	.17**	.10*	-						
7. Management	.77***	.11*	.05	.10*	.15**	.31***	-					
8. Depression-own	-.03	-.11*	-.07	-.10*	-.08	.07	.06	-				
9. Depression-family	-.06	-.08	-.06	.07	-.00	-.04	-.03	.30***	-			
10. Depression-stigma	-.03	-.12*	-.08	-.04	.11*	-.08	.04	.02	.09	-		
11. Seminar awareness	-.20***	-.15**	-.04	-.05	-.04	-.08	-.19***	.00	.07	-.04	-	
12. Seminar attendance	-.22***	-.11*	.00	-.07	-.06	-.19***	-.19***	-.07	-.02	-.00	.34***	-
13. Age	.18***	-.13*	-.04	.02	.02	.08	.21***	.05	-.02	-.18***	-.07	-.16**
Mean	9.30	1.56	2.48	.86	.41	1.80	2.19	1.26	1.44	1.38	1.48	1.82
Standard deviation	2.75	.68	.70	.35	.79	.83	1.60	.44	.50	.49	.50	.38

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

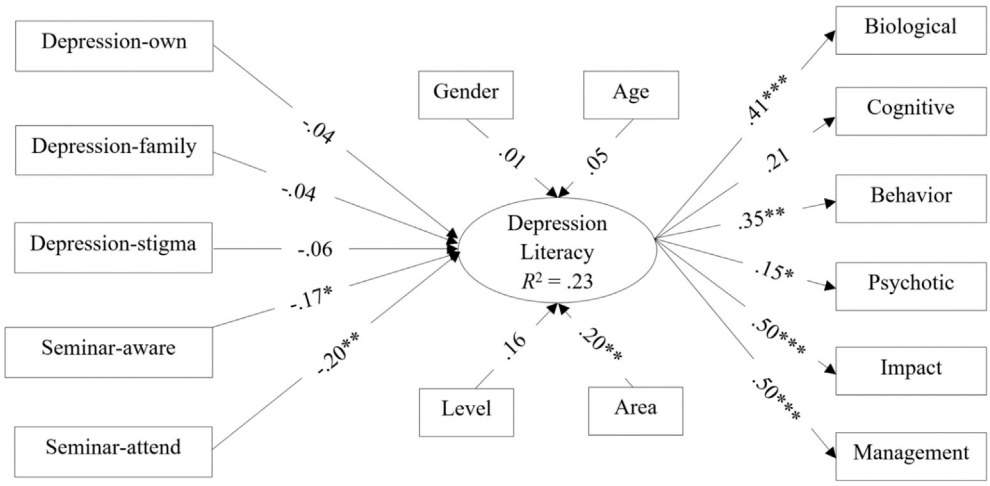

Figure 1. Final model of the relationships among variables. *Note.* For clarity covariances among the independent and control variables are not depicted in the figure. Latent variables are represented in the model by circles while observed variables are represented by rectangles. Depression-own = experienced depression over the past year (yes/no), Depression-family = Family member experienced depression over the past year (yes/no), Depression-stigma = I think depression is an illness like other physical illnesses (yes/no). Seminar-aware = Heard about any seminars (yes/no), Seminar-attend = Attended any seminars (yes/no). Level = Academic level (undergraduate/post-graduate); Area = Study area (basic/business/social/biological/nursing/medical). $^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

f = 9.157, $p < 0.001$), and management of depression (2.47 ± 1.60 vs. 1.88 ± 1.54, f = 14.416, $p < 0.001$). In addition to this, participants who had attended such programs had higher overall depression literacy (10.61 ± 2.72 vs. 9.02 ± 2.68, f = 20.135, $p < 0.001$), as well as knowledge concerning biological symptoms (1.72 ± 0.56 vs. 1.52 ± 0.70, f = 4.716, p < 0.01), the impact of depression (2.14 ± 0.81 vs. 1.73 ± 0.81, f = 15.014, $p < 0.001$) and management of depression (2.84 ± 1.80 vs. 2.05 ± 1.52, f = 14.930, $p < 0.001$) scores (Table 1).

Table 2 shows the number of correct and incorrect responses to the Bangla D-Lit. At least 50% of the participants reported nine correct responses: biological symptoms [i.e., sleep disturbance (84.2%) and change in eating habit (71.8%)], cognitive symptoms [i.e., guilt feeling (86.4%), self-esteem (91.6%) and impaired memory and attention (70.2%)], behavioral symptoms [i.e., psychomotor changes (86.1%)], impact of depression [i.e., hospitalization (64.4%) and famous peoples' depression sufferance (78.5%)], and management of depression [i.e., cognitive behavioral therapy (60.6%)] (Table 2).

Mean scores, standard deviations, and correlation coefficients of the study variables are shown in Table 3. Depression literacy total score was negatively and weakly correlated with seminar awareness (r = -0.20, $p < 0.001$), seminar attendance (r = -0.22, $p < 0.001$), and positively with age (r = 0.18, $p < 0.001$) and all subdimensions of depression literacy including biological (r = 0.44, $p < 0.001$), cognitive (r = 0.40, $p < 0.001$), psychotic (r = 0.36, $p < 0.001$), behavior (r = 0.41, $p < 0.001$), impact (r = 0.61, $p < 0.001$), and management (r = 0.77, $p < 0.001$). Finally, structural equation modeling was used to examine the predictive role of depression-related variables on depression literacy while controlling for gender, age, discipline study area, and study level (Figure 1). Goodness of fit values suggested mostly good fit to the data ($\chi 2 = 129.34$, df = 54, $p < 0.001$, $\chi 2/df = 2.40$, RMSEA = 0.06 [CI 90% (0.05, 0.07)], SRMR = 0.05, CFI = 0.87, GFI = 0.96). Seminar awareness (β = -0.17, $p < 0.05$; 95% CI [-0.31, -0.03]) and seminar attendance (β = -0.20, $p < 0.01$; 95% CI [-0.37, -0.08]) were negatively related to depression literacy in the model. The tested model explained 23% of the variance in depression literacy.

4. Discussion

Having good mental health literacy has been suggested as having preventative benefits from potential mental health suffering (Gabriel and Violato, 2010). There is still a knowledge gap in this aspect in the context of Bangladesh. Therefore, the present study attempted to address the depression literacy gap among university-level students in Bangladesh.

The overall mean D-Lit score in the present sample was 9.30 (SD = 2.75) out of a total of 20. This was lower than that of medical graduates (11.19), nurses (10.30), and spinal cord injury patients (9.59) scores reported in Bangladesh (Arafat et al., 2018a; Mali et al., 2018). However, it was higher than other Bangladeshi cohorts that have been studied [e.g., private university graduates (8.34), depressed patients (7.55) (Arafat et al., 2018a), university freshers (6.55) (Arafat et al., 2019), and pre-university students (8.01) (Bhuiyan et al., 2020)]. As the Bangla D-Lit questionnaire comprised of 20 items (rather than the 22 original items), the findings are not compared with the studies conducted in outside Bangladesh.

The present study also found that nine items on the Bangle D-Lit were correctly reported by at least 50% of the respondents. Consequently, the present study's correct response rate was higher than most of the previous scores reported among Bangladeshi samples (i.e., five correct items among fresher university students, seven correct items among pre-university students, six correct items among depressed patients); however, equal to graduate students (nine correct items), and lower than medical students and professionals (12 correct items), nurses (13 correct items), and spinal cord injured patients' responses (10 correct items) (Arafat et al., 2018a; Arafat et al., 2019; Bhuiyan et al., 2020; Mali et al., 2018).

The present study found no gender-based difference concerning overall D-Lit scores. However, previous studies [e.g., conducted among Australian students and university staff (Reavley et al., 2012), British general population (Swami, 2012)] reported higher mental health literacy among males. Other studies have reported US female students to have a higher ability to recognize mental health issues such as depression compared to male students (Coles et al., 2016). Previous studies conducted in Bangladesh did not report any significant gender differences concerning D-Lit scores [i.e., among pre-university students (Bhuiyan et al., 2020), among university freshers (Arafat et al., 2019)]. Generally, compared to males, females are more prone to suffering mental disorders (as well as higher suicidal thoughts and suicide attempts), therefore increasing mental health literacy among this target group is warranted (Schrijvers et al., 2012; Wilhelm, 2009).

It is well-established that the more educated someone is (with or without exposure to health-related education such as medical and nursing education) the higher their depression literacy level (Arafat et al., 2018a; Fonseca et al., 2017; Lauber et al., 2005) also reported that students from medical science and psychology had higher depression literacy than other types of students. Similarly, this assertion is also supported by the present study's findings (i.e., students from non-health-related study areas had lower depression literacy compared to students from medical or allied health sciences). Moreover, correct recognition of depression increased with higher levels of education (i.e., postgraduates scored more correct answers than undergraduates). This has been reported in previous studies (e.g., Reavley et al., 2012; Yap and Jorm, 2012). However, it is simply a function of age with older individuals having more years of education.

It was hypothesized that participants who had experienced personal or family depression during the past year would have higher depression literacy compared to those that had no personal experience of depression (i.e., those who had experienced or had exposure to first-hand depression may have been expected to know more about the features of depression, and have more knowledge). However, the present study found no significant differences. Similar findings were reported in a very recent study of Bangladesh, where there was no difference in depression literacy scores between those students who suffered from mental issues (i.e., depression and anxiety) and those who did not (Bhuiyan et al., 2020). However, it should be noted that participants' experiences of depression were only based on their perceptions rather than any formal diagnosis of themselves or others. So, it could have been the case that some of the participants (and/or their family members) had not experienced clinical depression and neither did not necessarily know what true depression entails. Knowledge awareness programs are therefore recommended for all individuals even those who have personal experiences of depression (i.e., themselves and/or family members) which may be beneficial in early prevention of depression, and also may help in developing resilience to these psychiatric issues (Bhuiyan et al., 2020; Gabriel and Violato, 2010; Ruble et al., 2013).

As has been reported globally, mental health programs increase mental health literacy. However, there was a lack of data available in the context of Bangladesh. Higher depression knowledge was reported by those participants who attended seminars, workshops, or other programs related to depression or mental health, and/or simply heard about these programs from friends and social media. The SEM analysis indicated that seminar awareness and seminar attendance were the best predictors of D-Lit. However, most of the participants who had heard about arranging these programs did not attend them (i.e., 52.0% heard about, but only 17.6% had attended such an event). Therefore, program organizers need to consider the factors as to why most individuals who heard about these types of programs did not attend them. Such factors are related with the target audience (i.e., if the programs are not student-focused), attendance cost, the day of the event (students may not be able to attend on weekdays due to class attendance), and event location and distance from their home, unwillingness to participate and so on. Knowing the barriers is vital to why individuals do not attend worthwhile events, even when they are aware of its importance, so that the organizers can come to facilitate program attendance and promote mental wellbeing effectively.

5. Limitations and conclusions

The present study has several limitations. The study was cross-sectional, and the sample size was modest. Additionally, personal and family history of depression was assessed with single questions rather than the use of a validated psychometric instrument. Furthermore, there is also the possibility of self-selection bias with those of experience of depression being more likely to participate (although based on the D-Lit scores, there does not appear to be any evidence of such bias). There are also inherent biases in any self-report methodology (such as recall biases and social desirability biases). However, it should also be highlighted that compared to offline surveys, online surveys (i) increase confidentiality, (ii) increase anonymity, (iii) have better response rates, and (iv) have higher levels of honesty (Van Gelder et al., 2010). It should also be noted that the D-Lit scale comprises a multiple-choice response format (as opposed to being free recall). Consequently, the percentage of correct responses could have been artificially higher because some answers could have been guessed correctly.

Despite these limitations, the present findings contribute to addressing the information gap in the Bangladeshi context. The present findings suggest that the level of depression literacy was low in the investigated population. This should be addressed as soon as possible given the high levels of depression in Bangladesh compared to other countries internationally. The study also provides beneficial data to mental health program developers and organizers to focus depression knowledge on areas that are much less known about by university students such as psychotic symptoms (e.g., auditory hallucinations, irrelevant speech, and reckless behavior), the impact of depression (e.g., impairment due to mild depression), and management of depression (e.g., the role of psychologist, antidepressants addictive properties, duration of action, the timing of stopping antidepressants, the role of vitamins, and other treatment options). Such education-related programs should be implemented nationally, and special focus should be paid to non-science students whose depression literacy appears to be substantially lower than that of science students.

Declarations

Author contribution statement

M. A. Mamun: Conceived and designed the experiments; Analyzed and interpreted the data; Wrote the paper.

A. M. Jobayar, I. Rayhan: Performed the experiments.

K. Kircaburun: Analyzed and interpreted the data.

S. Naher: Contributed reagents, materials, analysis tools or data; Wrote the paper.

M. D. Griffiths, M. S. Moonajilin: Contributed reagents, materials, analysis tools or data.

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Competing interest statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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