

Prevalence and predictors of depression and suicidal ideation among adolescents attending government secondary schools in Malaysia

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INTRODUCTION

Adolescence is a stage where there are many changes; physically and emotionally. It is a period of gradual transition from childhood to adulthood. The process of growing up is complicated and challenging. Adolescents are faced with many expectations, responsibilities, influences and uncertainties during this phase.¹ Approximately 20% of adolescents will have a mental health problem, usually either depression or anxiety in any particular year. History of violence, embarrassment, depreciation, and poverty would increase the risk of getting a mental health problem.²

Depression

Depression is a common mental disorder, characterized by persistent sadness, loss of interest or pleasure, feeling of guilt or low self-worth, disturbed sleep or appetite, feelings of tiredness, and poor concentration. This mental disorder can either be long-term or recurring and significantly deteriorates a person's ability to perform at work or school or in daily life. Over 350 million people with any age are suffering from depression worldwide.³

In Malaysia, the Third National Health and Morbidity Survey (NHMS III)⁴ found that the prevalence of psychiatric morbidity among children and adolescents aged five to sixteen years old was 20.3%. It was a disturbing finding as only 13% of psychiatric morbidity was reported in this age group in the NHMS II.⁵ The screening tool used in both NHMS II and III was the Reporting Questionnaire for Children (RQC), which was developed by the World Health Organization (WHO). The NHMS III⁴ showed that the prevalence of psychiatric morbidity among males was 21.6%, which was higher than the females (19.1%). Those children and adolescents from households with income lower than RM 3000 per month were reported to have a higher prevalence of psychiatric morbidity.⁴ In the NHMS IV,⁶ it was reported that the overall prevalence of psychiatric morbidity among this age group was 20.0% (the same questionnaire, RQC was used). Again, males (21.8%) showed a higher prevalence of psychiatric morbidity compared to females (18.1%).⁶

The prevalence of psychiatric morbidity among this age group showed an increasing trend from 13.0% in 1996, to 19.4% in 2006 and 20.0% in 2011.⁷ In the latest NHMS, it was reported that the overall prevalence of psychiatric

morbidity among this age group decreased to 12.1% in 2015.⁸ The low prevalence of psychiatric morbidity should be interpreted with caution as this survey used a different screening tool, The Strength and Difficulties Questionnaire (SDQ) was used in this NHMS (2015).⁸

Suicidal ideation

According to the National Strategy for Suicide Prevention 2001,⁹ suicidal ideation is defined as "self-reported thoughts of engaging in suicide-related behavior".⁹ Suicidal ideation is one of the strongest predictors of future suicidal behaviour.¹⁰ Suicide is the second leading cause of death for those aged 15 to 29 years old.¹¹ Mortality caused by suicide has increased about 60% in the past 45 years. At the same time, the highest suicide rates according to age, have moved towards younger subjects between 35 to 45 years old, and even 15 to 25 years old. In fact, suicide is one of the top five causes of death for both men and women.¹²

The National Suicide Registry Malaysia captured information on completed suicides, the youngest case was 12 years old^{13,14} and among suicide victims who had a history of mental illness, depression was the most common mental illness.^{14,15} Based on these alarming findings, this study was conducted to determine the prevalence of depression and suicidal ideation among adolescents attending government secondary schools in Malaysia. This study also aimed to find out the predictors of depression and suicidal ideation among students of this age group; so that high-risk groups can be identified to avoid further cases of suicide.

MATERIALS AND METHODS

Study design and location

A cross-sectional study was carried out from January to July 2012, in ten out of 37 randomly selected secondary schools in the Hulu Langat district area in the state of Selangor by using multistage cluster random sampling method. 160 to 180 students were selected from each school to make up the estimated sample size of about 1800. The students were selected according to a cluster of classes that were randomly chosen by the school authorities in view of logistic reasons. All students in the selected classes were invited to participate in the study.

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The inclusion criteria were students whose ages ranged from 13 to 17 years old. The exclusion criteria were absentees on the days when the study was carried out and who were not given consent to participate by their parents. Questionnaires were administered by research assistants who were medical students during classes.

Instruments

The data were collected using validated, pre-tested, and standardized questionnaires in Bahasa Malaysia. The questionnaires consisted of two sections: (1) Section A; socio-demographic profile such as age, gender, family income and parental marital status, and (2) Section B; psycho-social domains including a) internalizing factors such as depression, suicidal ideation, anxiety, stress, self-esteem; and b) externalizing factors such as smoking and bullying.

Depression

The Patient Health Questionnaire-9 (PHQ-9) is a self-report measurement, consisting of nine questions based on the nine DSM-IV criteria for diagnosing major depression. It is used to determine the presence or absence of depression. Its brevity coupled with good construct and criterion validity makes PHQ-9 a simple dual-purpose instrument for making diagnoses and assessing the severity of depressive disorders. The validated PHQ-9 (Malay version) was used to determine depression in this study.¹⁶ It was found to be a reliable and valid instrument for detecting depression among women attending a government primary care clinic in Malaysia.^{16,17} The original English version was first published in 2001 by Kroenke, Spitzer & Williams.¹⁸ The 9 items in the PHQ-9 refer to symptoms experienced during the two weeks prior to answering the questionnaire. Each item has four answers ("not at all", "several days", "more than half the days", and "nearly every day"), with corresponding scores of 0 (not at all) to 3 (nearly every day); giving a total score from 0 to 27. Respondents with scores of 10 and above were categorised as having depression.¹⁶⁻¹⁸

Suicidal ideation

The prevalence of suicidal ideation in this study was determined by using the ninth question in the PHQ-9 "Thoughts that you would be better off dead or of hurting yourself in some way".¹⁶⁻¹⁸ Respondents who answered "several days", "more than half the days", and "nearly every day" were categorized as having suicidal ideation in this study.

Anxiety

The original English version of the Generalised Anxiety Disorder-7 (GAD-7) questionnaire was developed for use in primary care by Spitzer, Kroenke, Williams and Lowe.¹⁹ It is a self-reported question-naire with good reliability and sensitivity for diagnosing and consists of seven items for measuring symptoms of generalised anxiety disorder, panic disorder, social anxiety and post-traumatic stress disorder (PTSD).²⁰ Scores of GAD-7 range from 0 to 21. Similar to the PHQ-9, these items refer to symptoms experienced during the two weeks prior to answering the questionnaire, and each item has four answers ("not at all", "several days", "more than half the days", and "nearly every day"), corresponding to scores from 0 (not at all) to 3 (nearly every day). The

validated GAD-7 (Malay version) was used to determine anxiety at a cut-off point of 8 and above.²¹ This version was found to be a valid and reliable instrument for detecting anxiety among female patients attending a government primary care clinic in Malaysia.^{13,22}

Stress

To determine stress, 7 items in the validated Malay version of Depression, Anxiety and Stress Scale (DASS-21) was used in this study; where total scores of questions numbered 1, 6, 8, 11, 12, 14, and 18 were used.²³ For each question, the scores ranged from 0-3. A total score of 0 to 14 was considered normal, while scores between 15 to 42 were considered as having stress. DASS-21 was used to measure stress only but not depression and anxiety. The PHQ-9 was used for depression and GAD-7 for anxiety because of their excellent validity.

Self-esteem

Information regarding the level of self-esteem of the respondents was obtained using the Malay version of the Rosenberg's Self Esteem Scale (RSES) questionnaire.²⁴ It consists of 10 questions, with scores ranging from 1 to 4; whereby a score of 1 represented "strongly agree", 2 (agree), 3 (disagree), and 4 (strongly disagree). However, there are several questions which are negatively directed (questions number 3, 5, 9, and 10). For these questions, reverse analysis was used; whereby scores of 1 (strongly disagree), 2 (disagree), 3 (agree), and score of 4 (strongly agree) were used. The total scores were then summed up and respondents were categorized as having low self-esteem if their total scores were 14 and below. Respondents with total scores of 15 and above were considered as having average or high self-esteem.²⁵

Smoking and Bullying

Questions to determine smoking and bullying in this study were obtained from the Youth Risk Behaviours Surveillance Questionnaire.

Ethical Approval

Approvals were obtained from the Ministry of Education, Selangor Education Department, Education Office of Hulu Langat District, principals of the selected schools, and the Medical Research Ethics Committee of the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia. Parental consent for each respondent was also obtained prior to data collection. All the data collected were kept confidential at all times.

Statistical analysis

Data were analysed using Statistical Package for Social Sciences (SPSS) version 21. The normality of data was tested using histogram, standard error of skewness, and Kolmogorov-Smirnov test. To examine the association between variables, the Chi-square test was used. Logistic regression analysis was used to determine the predictors for depression and suicidal ideation. Factors found to be significantly associated with depression and suicidal ideation based on the Chi-square test were entered into the binary logistic regression models for depression and suicidal ideation respectively. The 'enter method' of logistic regression was

used to determine the significant predictors for depression and suicidal ideation in this study. All significant levels were set at a standard p-value of < 0.05 .

RESULTS

Out of 1800 students selected, 1769 responded giving an overall response rate of 98.3%. Table I shows the distribution of socio-demographic characteristics of the respondents. The data for the age of the respondents were normally distributed based on the graphical presentation of the histogram. The mean age of the respondents was 14.4 years old ($SD = 1.3$) with 95% confidence interval 14.4 to 14.5 years and ranged from 13 to 17 years. The mean age amongst females (14.5 years) was significantly higher than the males (14.4 years). The majority of the respondents were females (52.6%) and had parents who were married and living together (91.6%). The results also showed that 56.4% of respondents had an average family income of less than RM3,000 per month.

Out of 1769 respondents, 1765 responded to the PHQ-9 and 577 (32.7%) were found to have depression. Scores of the PHQ-9 questionnaire ranged from 0 to 23, with a mean score of 8.1. Out of 1767 respondents who responded to the ninth question of the PHQ-9 which was "Thoughts that you would be better off dead or of hurting yourself in some way", 493 responded either "several days", "more than half the days" or "nearly every day". This gave a prevalence of 27.9% of respondents having suicidal ideation in this study.

As for the GAD-7, 1767 responded to the questions and 467 (26.4%) of them were found to have anxiety. Scores of the GAD-7 questionnaire ranged from 0-21, with a mean score of 5.4.

There was a total of 1751 respondents for the questions on DASS-21 and 676 (38.6%) of them were found to have stress. Scores for stress assessed with the DASS-21 questionnaire ranged from 0 to 21, with a mean score of 5.5.

There was a total of 1761 respondents for the questions on self-esteem. The scores ranged from 4 to 30, with a mean of 18.6 ± 3.9 . Approximately 14.1% of the respondents reported having low self-esteem; as their total scores on the RSES were 14 and below.

Out of 1769 respondents, 1721 (97.3%) answered the question for smoking. A total of 280 (16.3%) of those who responded admitted to being ever smokers, while 1441 (83.7%) never smoked. A total of 1758 (99.4%) respondents answered the question on bullying and 334 (19.0%) of them were found to be victims of bully.

Factors found to be associated with depression in this study were the age group, bully victims, smoking, anxiety, stress and low self-esteem ($p < 0.001$), as well as bullying ($p < 0.05$) (Table II). Further analysis using multivariate analysis found that anxiety, stress and low self-esteem were significant predictors of depression among the respondents in this study (Table III).

Factors found to be associated with suicidal ideation in this study were bully victims, depression, anxiety and stress ($p < 0.001$), as well as sex and being bullies ($p < 0.05$) (Table IV). Further analysis using multivariate analysis found that significant predictors of suicidal ideation among the respondents in this study were bully victims, depression, anxiety and stress (Table V).

DISCUSSION

Depression

This study found that the prevalence of depression among secondary school students was 32.7%. A study by Siti et al²⁶ conducted among 1407 Malaysian secondary schools students aged between 13 to 17 years old, found that the prevalence of depression among the adolescents was 24.2%.²⁶ While the instrument to measure depression in Siti's²⁶ study was the Children Depression Inventory (CDI).

Stress is one of the predictors of depression found in this study. Siti's²⁶ study predictor of depression was found to be stress which was similar to this study. This finding also supported by a study conducted among 2184 adolescents aged between 11 to 18 years old.²⁷

Low self-esteem is also found to be a significant predictor of depression in this study which is similar to Siti et al's²⁶ study. Apart from that, a study among ethnic minority, Canadian Aboriginal youth (age 12), the same result was found whereby high levels of self-esteem was found to be a protective factor for depressive symptoms.²⁸

As for anxiety being a significant predictor of depression among secondary school students, a study by Klein et al²⁹ had findings which support the findings of this study. Klein et al's²⁹ study on predictors of subthreshold depressive disorder progression to the full onset of depressive disorder among adolescents found that a history of anxiety disorder was a significant predictor of depression.²⁹

Suicidal Ideation

This present study found that the prevalence of suicidal ideation was 27.9%. The prevalence of suicidal ideation in this study was higher than the prevalence of suicidal ideation among 72,623 adolescents aged 12–18 years (19%), which was found in another study.³⁰ The finding of this study was also higher than a similar study on Malaysian school students in 2005,³¹ 2013³² and 2014.³³ Chen et al³¹ reported that about 7% of adolescents reported more serious suicide ideation (whereby they had seriously considered attempting suicide during 12 months prior to the survey), and about 10.4% had made suicidal plans within the same time. The measurement of suicidal ideation used in previous studies has contributed to these contradicting results.

In contrast, a study had found a higher prevalence of suicidal ideation as compared to this study, the prevalence of suicidal ideation among 2341 Taiwanese urban adolescents who were aged from 12 to 18 years old was 51.2% and this could be due to bio-psychosocial factors,³⁴ for example, adolescents' attitude towards suicide. They may think suicide is a brave behaviour, not a shameful behaviour and may be acceptable

Table I: Socio-demographic characteristics of the respondents (N=1769)

Variables	Frequency	Percentages
	(N = 1769)	(%)
Age group		
13	533	30.1
14	587	33.2
15	16	0.9
16	627	35.4
17	6	0.3
Gender		
Male	838	47.4
Female	931	52.6
Parents marital status		
Married (Staying together)	1621	91.6
Separated	67	3.8
Single mother	64	3.8
Single father	13	0.7
Others	4	0.2
Average family income per month		
Low (< RM3,000)	998	56.4
High (≥ RM3,000)	771	43.6

Table II: Factors associated with depression based on PHQ-9 among secondary school children in Selangor (N=1765)

Variables	Depression		Total	p-value
	Present	Absent		
Age Group				
Lower form	331 (29.2%)	804 (70.8%)	1135 (100.0%)	**0.000
Upper form	246 (39.0%)	384 (61.0%)	630 (100.0%)	
Gender				
Male	255 (30.5%)	582 (69.5%)	837 (100.0%)	0.058
Female	322 (34.7%)	606 (65.3%)	928 (100.0%)	
Family income				
Low	320 (32.2%)	674 (67.8%)	994 (100.0%)	0.613
High	257 (33.3%)	514 (66.7%)	771 (100.0%)	
Parental Marital status				
Married	520 (32.2%)	1097 (67.8%)	1617 (100.0%)	0.115
Separated	57 (38.5%)	91 (61.5%)	148 (100.0%)	
Bully victims (n=1755)				
Yes	136 (40.8%)	197 (59.2%)	333 (100.0%)	**0.000
No	439 (30.9%)	983 (69.1%)	1422 (100.0%)	
Bullies (n=1755)				
Yes	64 (42.7%)	86 (57.3%)	150 (100.0%)	*0.007
No	511 (31.8%)	1094 (68.2%)	1605 (100.0%)	
Smoking (n=1759)				
Yes	118 (42.1%)	162 (57.9%)	280 (100.0%)	**0.000
No	456 (30.8%)	1023 (69.2%)	1479 (100.0%)	
Anxiety				
Yes	338 (72.4%)	129 (27.6%)	467 (100.0%)	**0.000
No	239 (18.4%)	1059 (81.6%)	1298 (100.0%)	
Stress (n=1753)				
Yes	293 (67.2%)	143 (32.8%)	436 (100.0%)	**0.000
No	281 (21.3%)	1036 (78.7%)	1317 (100.0%)	
Self-esteem (n=1758)				
Low	155 (62.2%)	94 (37.8%)	249 (100.0%)	**0.000
High	422 (28.0%)	1087 (72.0%)	1509 (100.0%)	

*p <0.05 significant

**p<0.001 significant

as a problem-solving strategy under certain circumstances. However, in Malaysia, cultural and religious factors may play an important role, as the majority of Malaysians are Muslim and suicide is strictly prohibited by Islam. A previous local study also revealed that Malaysian adolescents with high spirituality had less suicidal behaviour than others.³⁵

Most predictors that relate to suicidal ideation among these students were identified as adverse psychological correlates (depression, anxiety, stress, bully victims, and low-esteem). These have in fact resulted in the accumulation of unacceptable inner feelings which are internalized; and expressing wish to hurt oneself or would be better dead maybe one of the mechanisms to verbalize this feeling.^{36,37}

Table III: Predictors of depression among the respondents

Variables	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
Age group	0.177	0.129	1.885	1	0.170	1.193	0.927	1.535
Bully victims	0.196	0.157	1.556	1	0.212	1.217	0.894	1.657
Bullies	0.027	0.225	0.014	1	0.905	1.027	0.661	1.598
Smoking	0.244	0.170	2.062	1	0.151	1.276	0.915	1.781
Anxiety	2.103	0.136	240.567	1	**0.000	8.189	6.278	10.681
Stress	0.823	0.138	35.612	1	**0.000	2.277	1.738	2.983
Self-esteem	0.991	0.172	33.217	1	**0.000	2.694	1.923	3.774
Constant	-2.218	0.128	300.319	1	0.000	0.109		

**p<0.001 significant

Table IV: Factors associated with suicidal ideation based on the ninth question from PHQ-9 among secondary school children in Selangor (N=1767)

Variables	Suicidal ideation		Total	p-value
	Present	Absent		
Age Group				
Lower form	303 (26.7%)	833 (73.3%)	1136 (100.0%)	0.123
Upper form	190 (30.1%)	441 (69.9%)	631 (100.0%)	
Gender				
Male	214 (25.6%)	623 (74.4%)	837 (100.0%)	*0.038
Female	279 (30.0%)	651 (70.0%)	930 (100.0%)	
Family income				
Low	296 (29.7%)	700 (70.3%)	996 (100.0%)	0.053
High	197 (25.6%)	574 (74.4%)	771 (100.0%)	
Parental Marital status				
Married	447 (27.6%)	1172 (72.4%)	1619 (100.0%)	0.367
Separated	46 (31.1%)	102 (68.9%)	148 (100.0%)	
Bully victims (n=1757)				
Yes	131 (39.3%)	202 (60.7%)	333 (100.0%)	**0.000
No	361 (25.4%)	1063 (74.6%)	1424 (100.0%)	
Bullies (n=1757)				
Yes	57 (38.0%)	93 (62.0%)	150 (100.0%)	*0.004
No	435 (27.1%)	1172 (72.9%)	1607 (100.0%)	
Smoking (n=1761)				
Yes	85 (30.4%)	195 (69.6%)	280 (100.0%)	0.325
No	407 (27.5%)	1074 (72.5%)	1481 (100.0%)	
Depression (n=1765)				
Yes	322 (55.8%)	255 (44.2%)	577 (100.0%)	**0.000
No	171 (14.4%)	1017 (85.6%)	1188 (100.0%)	
Anxiety				
Yes	252 (54.0%)	215 (46.0%)	467 (100.0%)	**0.000
No	241 (18.5%)	1059 (81.5%)	1300 (100.0%)	
Stress (n=1755)				
Yes	230 (52.8%)	206 (47.2%)	436 (100.0%)	**0.000
No	260 (19.7%)	1059 (80.3%)	1319 (100.0%)	
Self-esteem (n=1760)				
Low self-esteem	111 (44.6%)	138 (55.4%)	249 (100.0%)	**0.000
High self-esteem	1157 (76.6%)	354 (23.4%)	1511 (100.0%)	

*p <0.05 significant **p<0.001 significant

Table V: Predictors of suicidal ideation among the respondents

Variables	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
Gender	0.138	0.125	1.215	1	0.270	1.147	0.899	1.465
Bully victims	0.549	0.150	13.475	1	**0.000	1.732	1.292	2.322
Bullies	0.367	0.211	3.046	1	0.081	1.444	0.956	2.182
Depression	1.474	0.136	116.848	1	**0.000	4.365	3.341	5.701
Anxiety	0.635	0.145	19.298	1	**0.000	1.887	1.421	2.505
Stress	0.425	0.141	9.120	1	*0.003	1.529	1.161	2.014
Self-esteem	0.823	0.162	25.929	1	**0.000	2.278	1.659	3.128
Constant	-2.397	0.139	297.229	1	0.000	0.091		

*p <0.05 significant**p<0.001 significant

This present study revealed that bully victims had a higher prevalence of suicidal ideation (39.3%) compared to those who were not bullied (25.4%). This finding is supported by a study by Liang et al³⁸ which was conducted among 5,074 South Africa adolescent school children in grade 8 (mean age 14.2 years) and grade 11 (mean age 17.4 years) in 72 government schools in Cape Town and Durban.³⁸ Liang's³⁸ study found that bully victims showed significantly elevated odds ratios of suicidal ideation. Similarly, a meta-analysis also found that there is an increased risk of suicidal ideation in bully victims.³⁹

As found in this study, respondents who confessed to bullying others also had a higher prevalence of suicidal ideation compared to those who did not bully others. However, this factor was not significant when further analysed with the logistic regression model. This could be due to an interaction between depression and bullying. A previous study which performed subgroup analyses found that independent association of bullying with increased risk of suicidal ideation among adolescents was affected by depression⁴⁰ and this was also supported by another previous study which revealed that adolescents with internalizing problems such as depression were more likely to be victims than bullies.⁴¹

As expected, one of the predictors of suicidal ideation in this study was depression. The prevalence of suicidal ideation was significantly much higher among the respondents with depression (55.8%) compared to those who were not depressed (14.4%). In their study among 2341 Taiwanese urban adolescents, Chang et al³⁴ found that depressive symptoms were significant predictors for suicidal ideation among the adolescents. Another study by Sun et al⁴² among 433 Hong Kong Chinese adolescents also found that depression was a strong mediator of suicidal ideation. Similarly, in South Korea, the similar predictor for suicidal ideation, which was depression also found in this study.³⁰

In Malaysia, a study was conducted by Mansor & Abbas³⁵ among 1500 adolescents aged between 13 and 18 years old found that depression has a significant relationship with suicidal behaviour, after analysing the data by using Structural Equation Modelling (SEM).³⁵ The result is in line with the finding of this present study because suicidal ideation subsequently predict future suicidal behaviour.¹⁰

This present study found that stress is one of the predictors for suicidal ideation among adolescents. A study was conducted among adolescent females in United State, aged between 12 to 16 years to examine the risk factors for suicidal ideation which focused on stress response. Respondents were exposed to psychosocial tasks, and cortisol levels pre- and post-stressors were used to assess the Hypothalamic-Pituitary-Adrenal (HPA) axis response. Respondents were then grouped into three groups; normative, hyporesponsive and hyperresponsive groups based on their cortisol level. This study found that females in the hyperresponsive group were at increased risk for reporting suicidal ideation three months after exposure to the psychosocial task.⁴³ It showed that the way adolescent females respond to the stressor is an important risk factor for suicidal ideation.

Strengths and limitations

One the strength of this study is it involved a large sample. Besides that, it was conducted in the Malay language, which is the national language of the local population. The Malay version of all study instruments in this study was available. This study also has several limitations. First, the assessment of suicide ideation through an item of a psychometric instrument and the suicidal ideation item is likely leading to overestimates of ideation, because it captures both thoughts of self-harm and of suicide. A specific instrument for assessing suicidal ideation could have been more valid for future research. Second, the study design for this study was cross-sectional rather than longitudinal. Due to the nature of the study design, the multivariate analysis was merely to control for confounding factors and would only be able to show an independent relationship between the independent variables and dependent variables. Therefore, the results of this study should be interpreted with caution because this study does not determine the cause and effect, and therefore more prospective studies are needed to meet the causality aspect of Hill's criteria.

CONCLUSION

The findings from this study reveal a high prevalence of depression and suicidal ideation, whereby almost one-third of the adolescents had depression and suicidal ideation. Although the instruments used in this study were mainly screening and not diagnostic, these adolescents need to be further assessed, counselled, and managed. This study definitely implies that mental health programs are urgently needed for secondary school students. Related to that, predictors of depression and suicidal ideation need to be recognized so that high-risk groups can be identified for effective interventions.

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