DEPRESSION AND ITS ASSOCIATED FACTORS AMONG SECONDARY SCHOOL STUDENTS IN MALAYSIA

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Abstract. Research in the field of factors associated with depression among adolescents is lacking in Malaysia. The aims of the present study were to assess the current prevalence of depression and its related factors among secondary school students in Pasir Gudang, South Malaysia. In this cross sectional study, 2,927 secondary school students (13-17 years old) from urban areas were screened for symptoms of mental disorder as well as demographic and risk behaviors using a validated Depression, Anxiety and Stress Scale (DASS) 12 questionnaire. The majority of the respondents (53.8%) were Malay, of which 53.1% were female. Symptoms of mild depression were found in 33.2% of the respondents, while the prevalence of the symptoms of moderate, severe, and extremely severe depression was 21.5%, 18.1%, and 3.0%, respectively. Logistic regression suggested that participants who were Chinese or had a lower average grade were three times more likely to have depression, while those who came from a single-parent family were twice as likely to have this condition. This study indicated that academic performance and risk behaviors along with the demographic characteristics are important contributors to adolescent depression.

Keywords: DASS 21, depression, ethnicity, illicit drugs, risk behaviors, Malaysia

INTRODUCTION

Depression is a common mental disorder in adolescents worldwide, and the burden of this condition can lead to disability (Australian Institute of Health and Welfare, 2007; McKenzie *et al*, 2010; Kieling *et al*, 2011). Depression is characterized by sadness, feelings of guilt, loss of interest, and poor concentration and is considered to be a leading cause of suicide and self-harm, as well as a decrease in educational achievement (Hysenbegasi *et al*, 2005; Australian Bureau of Statistics, 2012). Depression affects the hypothalamus and leads to neuroendocrine disorders that may affect an adolescent's biology and normal life (Rao *et al*, 2010).

Globally, the prevalence of mental health problem is 10%-20% among children and adolescents (Kieling *et al*, 2011). The prevalence of depression is different from one geographic area to another as a result of various factors, such as industrialization and populations that have different social levels and the accessibility of support facilities. Depressed adolescents are at risk of suffering from psychosocial

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impairments and increased hospitalization. In addition, depression can affect the performance of these adolescents at school as well as socialization (Bansal *et al*, 2009). Because the transition from childhood to adolescence results in dramatic mental and biological changes, the occurrence of psychosocial problems, such as depression, are common during this stage of life. Depression interferes with normal life and activities of the adolescents (Uba *et al*, 2010). Adolescents with depression are at risk of antisocial behavior, and alcohol and substance abuse (Bansal *et al*, 2009; Uba *et al*, 2010).

As a rapidly developing country, Malaysia is facing urbanization and modernization (Yusof, 2001), and coping with modernity related changes in lifestyle could result in stress and depression among the population (Sarris *et al*, 2014). Malaysian adolescents comprise one-fifth of the country's population, and more than 10% of them are suffering from depression (Adlina *et al*, 2007; UNICEF, 2011). Moreover, 5.2% of secondary schools adolescents in Malaysia have severe depression symptoms (Teng, 2011). The ethnic, economic, and cultural backgrounds of people in a region can cause worries and stresses for the population (Bailey *et al*, 2011; Nieuwsma *et al*, 2011).

Pasir Gudang, as an industrialized urban area with a mixture of several racial groups, is no exception, especially for its adolescents. At present, there is lack of local research on mental health in Malaysia (Teng, 2011) as well as in Pasir Gudang. The purposes of this study were to describe the prevalence of depression as well as explore its associated factors among 13-17-year-old adolescents in Pasir Gudang, Malaysia. These purposes were addressed with two research questions:

what is the prevalence of depression symptom among secondary school students in a district in the south of Malaysia, and what are the association factors to depression symptoms?

MATERIALS AND METHODS

Respondents and sampling

Forms 1, 2 and 4 (13-17 years old) secondary school students (*N*=2927: Male, 1,373 and Female, 1,554) were recruited in this study. Students of Form 3 were excluded from the study, as they were required to pass the Lower Secondary Assessment (PMR) examination according to the Malaysian educational system. The study population from the selected schools was literate and willing to complete the questionnaires.

Procedure

For this cross sectional study, 10 schools among 35 secondary schools in Pasir Gudang were randomly selected using a multistage cluster sampling method (Lwanga and Lemeshow, 1991). At first, based on the Department of Education in Pasir Gudang, the city was divided into 10 geographical sections. Then, from each section, one school was randomly selected by using a random number table. Hence, ten schools were randomly selected from all the ten districts. Classes and students were selected according to cluster sampling method. The survey was administered to students during class time. Students participated in the study voluntarily by filling in the consent form. The process of data collection was three months during 2012.

Ethical considerations

The ethics committees of the university and the Ministry of Education Malaysia

granted permission to conduct the study [Ref Nº UPM/FPSK/100-9/2-MJKEtikaPen (SPP3621(U); 2012 Apr 08]. Written informed consent was obtained from the students prior to their participation in the study. The inclusion criteria included students from Forms 1, 2, and 4.

Measures

Data were collected using a set of self-rated questionnaires, which included demographic factors (age, grade, gender, ethnicity, parental marital status, family arrangement, type of house and average household income), risk behaviors (consumption of alcohol, illicit drugs and cigarette smoking) and the Depression, Anxiety and Stress Scale (DASS-21). The academic performance of students was measured according to the average marks of the latest exams for all courses and subjects. The academic achievement was categorized into two levels including 'Poor' level (below average) and 'Good' level (average and above).

Depression, Anxiety and Stress Scale-21 (The DASS-21) can measure the symptoms of three distinct negative effects: depression, stress, and anxiety (Lovibond and Lovibond, 1995). It is a 4-point Likert scale questionnaire ranging from '0' (Did not apply to me at all) to '3' (Applied to me very much or most of the time). The Malay translated version of the DASS-21 was used in the present study. The initial assessment of the translated version revealed adequate validity and reliability indices. The cut-off scores for depression have been developed for defining scores for each DASS scale: normal (0-9),mild (10-13),moderate (14-20), severe, (21-27), and extremely severe (28+). In this study, normal and mild were categorized as 'No Depression Symptoms' and moderate-to-extremely severe as Depression Symptoms.

Risk behaviors

A questionnaire was developed and validated to assess the risk behaviors of the respondents. The questionnaire consisted of fifteen questions comprising three response questions, including score '1' indicating 'Yes', '2' indicating 'No,' and '3' indicating 'I do not know.' The reliability of the questionnaire was calculated using Cronbach's alpha (0.70), which was found to be acceptable. The factor analysis revealed that four items had the highest loading in the intimate relations category, three items had the highest loading in smoking, and the rest of the items were in the drug and alcohol consumption category. This questionnaire was shown to have an acceptable construct and concurrent validity against other available questionnaires (Brener *et al*, 2002; Skaar, 2009).

Due to the different methodologies in previous studies with other questionnaires in terms of study population and assessment protocol, predictive validity could not be assessed for the new questionnaire. Participants were asked to indicate their risk behaviors including alcohol consumption ('ever drinking alcohol,' 'why,' 'with whom,' and the 'frequency of drinking'), illicit drugs, and cigarette smoking ('ever smoked', 'why,' 'with whom,' and the 'frequency of smoking').

Statistical analysis

Data were collected and entered manually into the Statistical Package for Social Sciences (SPSS®, version 22.00; IBM, Armonk, NY). The percentage was used to describe the proportion of respondents with depression and risk behaviors. The chi-square test was used to determine the difference in the distribution pattern of the socio-economic variables and risk behaviors among the depression symptoms categories. Logistic regression was used to examine the relationship among

the demographic variables, risk behaviors and depression. The estimation for mean used a 95% confidence interval. All the significant levels were set at a standard p-value < 0.05 and odds ratio (OR) with 95% confidence interval to examine the risk association between variables.

RESULTS

Out of 3,000 respondents, 2,927 completed the questionnaire, giving a response rate of 97.5%. The mean age of the participants was 14.41 (SD=1.28, range 13-17 years old). About two-thirds of the respondents (65.4%) were 13-to-15 years old. Females made up 53.1% of the total number of respondents. Almost 54% of the respondents were of Malay ethnicity, 32.2% Chinese, and 12% Indian. About 15% of the respondents were reported to have below average grades in their academic performance. Less than 10% lived with a single parent, and one-fifth of the respondents (20.2%) came from disadvantaged families who earned less than MYR1,000 (USD239) a month and lived in a low-cost house.

Prevalence of depression symptoms among respondents

The prevalence of moderate to extremely severe depression symptoms was 42.5% (21.5% moderate, 18.1% severe, and 3.0% extremely severe). Moreover, one-third of the respondents (33.2%) presented symptoms of mild depression. Table 1 shows the distribution pattern of depression as per the respondents' socio-demographic factors. A significant difference in the distribution pattern of the symptoms of depression was observed with age (χ^2 =13.490, p=0.001) and ethnicity (χ^2 =103.303, p=0.001). The distribution pattern for depression was significantly different in the younger age group (χ^2=13.490, p=0.0001) and the respondents of Chinese ethnicity (χ^2=103.303, p=0.0001).

There was a significant difference in the distribution pattern of depression among the Forms and academic achievement groups, which indicated that those who studied in Form 1 had significantly more depression symptoms compared with those in the higher forms (χ^2=13.89, p=0.001), and respondents with below average grades also had significantly higher severe depression symptoms compared with those who obtained average and above average grades (χ^2=81.42, p=0.0001) (Table 1, 2). Moderate and extremely severe depression symptoms were significantly more prevalent among respondents who ever consumed alcohol (χ^2=25.136, p=0.0001) or used illicit drugs (χ^2=6.636, p=0.01). There was no significant difference in the distribution pattern of depression among smokers and non-smokers (p=0.863).

The prevalence of current and past alcohol consumers (Fig 1) differed among the ethnicities (Malay, Chinese, and Indian).The number of Chinese students who used to consume alcohol in the past and current alcohol consumers was 335 and 139, respectively; Malays: past consumers, 23, and current consumers, 3; and Indians: past consumers, 37 and current consumers, 6.

Table 3 shows the multivariate analysis between the symptoms of depression and its associated factors. The results showed that ethnicity, academic performance, and respondents' family arrangements significantly predicted the likelihood of having moderate-to-extremely severe depression among the respondents after controlling for the other associated factors. The likelihood of the Chinese ethnic group presenting

Table 1
Depression by socio-demographic factors of the respondents.

Variables	n(%)			χ^2	p-value
	Normal-Mild (No depression symptoms)	Moderate-Extremely severe (Depression symptoms)	Total		
Age (years)					
13-15	1,059 (55.0)	865 (45.0)	1,924 (100.0)	13.490	0.0001[a]
16-17	623 (62.1)	380 (37.9)	1,003 (100.0)		
Total	1,682 (57.5)	1,245 (42.5)	2,927 (100.0)		
Form					
1	565 (54.7)	468 (45.3)	1,033 (100.0)	13.890	0.001[a]
2	497 (55.4)	400 (44.6)	897 (100.0)		
4	620 (62.2)	377 (37.8)	997 (100.0)		
Total	1,682 (57.5)	1,245 (42.5)	2,927 (100.0)		
Gender					
Male	764 (55.6)	609 (44.4)	1,373 (100.0)	3.506	0.061
Female	918 (59.1)	636 (40.9)	1,554 (100.0)		
Total	1,682 (57.5)	1,245 (42.5)	2,927 (100.0)		
Ethnicity					
Malay	1,026 (64.7)	559 (35.3)	1,585 (100.0)	103.303	0.0001[a]
Chinese	418 (44.3)	525 (55.7)	943 (100.0)		
Indian	197 (58.3)	141 (41.7)	338 (100.0)		
Others	41 (67.2)	20 (32.8)	61 (100.0)		
Total	1,682 (57.5)	1,245 (42.5)	2,927 (100.0)		
Academic achievement[b]					
Good level	1,504 (60.9)	967 (39.1)	2,471 (100.0)	81.42	0.0001[a]
Poor level	161(37.5)	268 (62.5)	429 (100.0)		
Total	1,665 (57.4)	1,235 (42.6)	2,900 (100.0)		
Parent marital status					
Married	1,509 (57.6)	1,112 (42.4)	2,621 (100.0)	0.033	0.855
Divorced/Single/Deceased	135 (57.0)	102 (43.0)	237 (100.0)		
Total	1,644 (57.5)	1,214 (42.5)	2,858 (100.0)		
Family arrangement					
With both parents	1,497 (57.8)	1,091 (42.2)	2,588 (100.0)	1.47	0.225
With one parent	181 (54.4)	152 (45.6)	333 (100.0)		
Total	1,678 (57.4)	1,243 (42.6)	2,921 (100.0)		
Type of house					
Low cost	324 (54.9)	266 (45.1)	590 (100.0)	1.982	0.159
Non-low cost	1,356 (58.1)	977 (41.9)	2,333 (100.0)		
Total	1,680 (57.5)	1,243 (42.5)	2,923 (100.0)		
Average household income (MYR)					
>1,000	963 (61.5)	604 (38.5)	1,567 (100.0)	1.111	0.292
≤1,000	315 (58.9)	220 (41.1)	535 (100.0)		
Total	1,278 (60.8)	824 (39.2)	2,102 (100.0)		

[a]Significant at $p<0.05$; [b]Good level, average and above; Poor level, under average.

Table 2
Association between depression symptoms and adolescent risk behaviors.

Variables	$n(\%)$			χ^2	p-value
	Normal-Mild (No depression symptoms)	Moderate-Extremely severe (Depression symptoms)	Total		
Cigarette smoking					
Yes	266 (57.1)	200 (42.9)	466 (100.0)	0.03	0.863
No	1,378 (57.5)	1,018 (42.5)	2,396 (100.0)		
Total	1,644 (57.4)	1,218 (42.6)	2,862 (100.0)		
Alcohol consumption					
Yes	185 (45.9)	218 (54.1)	403 (100.0)	25.136	0.0001[a]
No	1,446 (59.2)	995 (40.8)	2,441 (100.0)		
Total	1,631 (57.3)	1,213 (42.7)	2,844 (100.0)		
Illicit drug use					
Yes	14 (36.8)	24 (63.2)	38 (100.0)	6.636	0.01[a]
No	1,613 (57.6)	1,185 (42.4)	2,978 (100.0)		
Total	1,627 (57.4)	1,209 (42.6)	2,836 (100.0)		

[a]Significant at $p<0.05$.

symptoms of depression was about three times higher compared to the other ethnic groups (OR=2.62; 95% CI: 1.31-5.22). The respondents with below average grades were also three times more likely to have depression symptoms than those with good academic grades (OR=2.94; 95% CI: 2.13-4.06). The possibility of those who lived with one parent exhibiting symptoms of depression was about two times higher than those living with both parents (OR=1.78; 95% CI: 1.03-3.07).

DISCUSSION

This study suggested that there was the high prevalence of depression symptoms among secondary school adolescents. In this study, the prevalence of depression (moderate-to-extremely severe level) was 42.5%; while in previous studies, depression in Malaysia among the early adults was from 12.3-to-21.3%

(Teo and Say, 2012; Tan and Yadav, 2013). Tan and Yadav (2013) recruited about 300 young adults (under 25-years-old), which is not a true representation of the actual community. Moreover, they used the Patient Health Questionnaire (PHQ-9), which determines the absence or presence of depressive symptoms. Beck Depression Inventory-IA (BDI-IA) was the instrument used in the study by Teo and Say (2012) with an Internet based data collection. Their respondents were university students (18-25-years-old), whereas the current study indicated that younger adolescents have more depression symptoms than the older adolescents have. In line with the current study, studies have found that early adolescence is a time of life with a high level of stressful challenges, which causes depressive symptoms (Sund *et al*, 2011; Tajik *et al*, 2014). This is also comparable with the current study in which younger students, most of whom were
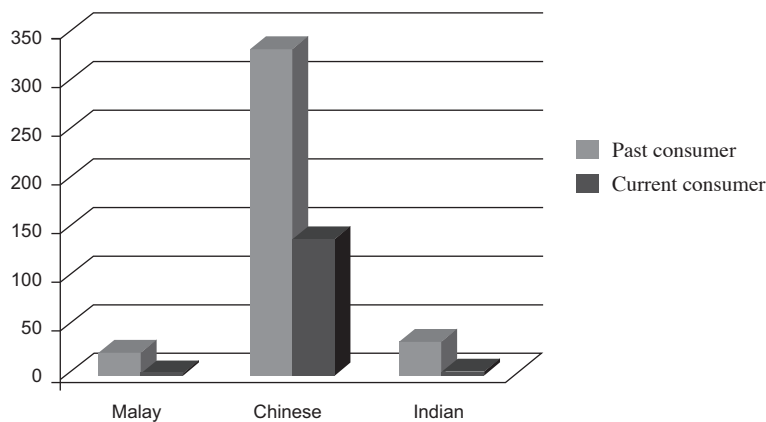
Fig 1–Number of students who were past alcohol consumers or current alcohol consumers.

in Form 1, were more depressed than the others ($p<0.01$).

Gender did not have any effect on depression. Ethnicity showed an influence on depression among adolescents, which indicated that Chinese adolescents had a higher risk of depression compared to the other races. Conversely, sociodemographic factors (income and parental marital status) were not significantly different between the ethnic groups. Based on the ethnic distribution in Malaysia, the Indians are considered to make up 6.7% of the population. Previous studies also showed that ethnicity and ethnic minority may affect depression within society (Anderson and Mayes, 2010; Rosenfield and Mouzon, 2013.) The reason why no relationship was found between Indian ethnicity and depression might be partly due to the small number of Indians in this study as well as the cultural differences between these ethnicities.

Another important finding of this study was the higher consumption of alcohol among Chinese students. The number of Chinese students who used to consume alcohol in the past and current

alcohol consumers was significantly higher than the Malay and Indian students. The prevalence of current alcohol consumers is comparable to another Malaysian study that showed that 4.1% of adolescents consumed alcohol (Adlina *et al*, 2007). Although some studies have stated that alcohol consumption is probably a result of depression (Poulin *et al*, 2005; Sullivan *et al*, 2005; Schulte *et al*, 2009), Boden and Fergusson (2011) reported that alcohol consumption could increase the occurrence of major depression as a result of exposure to neurophysiological and metabolic changes. However, the reason for this mechanism is as yet unclear (Schulte *et al*, 2009).

In the current study, the use of illicit drugs showed a significant association with depression. This finding was in line with the findings of the previous studies (Teo and Say, 2012; Gorka *et al*, 2013). A study by Yusoff *et al* (2014) indicated that 1.7% of Malaysian adolescents used illicit drugs, which is comparable with the current study (1.2%). The consumption of drugs seems to be common in the US, as drug use and drug abuse among US adolescents is 42.5% and 16.4%, respectively (Adlina *et al*, 2007). Some researchers indicate a progressive depressive mood among the users of drugs (Swendsen *et al*, 2012; Gorka *et al*, 2013; Yusoff *et al*, 2014). Moreover, Gorka *et al* (2013) reported that adolescents whose parents used illicit drugs were significantly associated with depressive moods. Unlike the alcoholic factor, there was no difference between

Table 3
The regression analysis between depression symptom and its associated factors.

Variables	Multivariate analysis			
	Frequency (*n*) and percentage (%)	OR	95% CI	*p*-value
Age group (*n*=1,245)				
13-15	865 (69.5)	0.59	0.211-1.667	0.322
16-17	380 (30.5)	1.00		
Gender (*n*=1,245)				
Male	609 (48.9)	1.00		
Female	636 (51.1)	0.89	0.725-1.081	0.233
Ethnicity (*n*=1,245)				
Malay	559 (44.9)	0.92	0.466-1.823	0.814
Chinese	525 (42.2)	2.62	1.314-5.221	0.006[a]
Indian	141 (11.3)	1.22	0.593-2.493	0.593
Others	20 (1.6)	1.00		
Form (*n*=1,245)				
Form 1	468 (37.6)	2.49	0.876-7.093	0.087
Form 2	400 (32.1)	2.66	0.941-7.535	0.065
Form 4	377 (30.3)	1.00		
Average grades (*n*=1,235)				
Average and above	967 (78.3)	1.00		
Below average	268 (21.7)	2.94	2.133-4.059	0.0001[a]
Parent marital status (*n*=1,214)				
Married	1,112 (91.6)	1.00		
Divorced/Single/Deceased	102 (8.4)	0.68	0.362-1.264	0.220
Household income (*n*=824)				
≥RYM 1,000	604 (73.3)	1.00		
<RYM 1,000	220 (26.7)	1.13	0.901-1.412	0.295
Family arrangement (*n*=1,243)				
With both parents	1,091 (87.8)	1.00		
With one parent	152 (12.2)	1.78	1.029-3.067	0.039[a]
Type of house (*n*=1,243)				
Low cost	266 (21.4)	1.03	0.808-1.316	0.805
Non low cost	977 (78.6)	1.00		
Cigarette smoking (*n*=1,218)				
Yes	200 (16.4)	1.29	0.972-1.706	0.078
No	1,018 (83.6)	1.00		
Alcohol consumption (*n*=1,213)				
Yes	218 (18.0)	0.93	0.685-1.269	0.655
No	995 (82.0)	1.00		
Illicit drug use (*n*=1,209)				
Yes	24 (2.0)	1.48	0.584-3.762	0.408
No	1,185 (98.0)	1.00		

[a]Significant at *p*<0.05.

ethnicity and use of drugs in the present study.

The single-parent family, although not often taken into consideration, is one of the important factors that could lead to depression (Medina-Mora and Gibbs, 2013). In the current study, family arrangement emerged as a risk factor for depression among adolescents. Students who lived with one parent were twice as likely to suffer from depression than those who lived with both parents were. Furthermore, one study reported that, in Malaysia, family factors, such as single-parent status, contribute to the internalized and externalized problems of adolescents (Lee *et al*, 2007). Researchers believe that interventions should include the whole family and not focus solely on the adolescent (Sexton *et al*, 2003; Barton *et al*, 2007).

This study provides information concerning the factors related to depression among adolescents in the southern part of Malaysia, which are characterized by demographic and risk behavior factors. One limitation of this study was recruiting respondents from the urban area; therefore, measuring the same factors among rural students is needed. In addition, since the prevalence of depression in this community is higher than in other societies, further research is required to clarify other depression-related factors, such as cultural and religious practices, nutritional status, and the level of physical activity among the adolescents.

The findings of this study suggested that the consumption of alcohol and illicit drugs as well as low academic performance are factors associated with depression among adolescents, especially in the early adolescent years. Furthermore, parent's marital status is a factor associated with symptoms of depression among adolescents.

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