Depression and anxiety among high school student at Qassim Region

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ABSTRACT

Background: Adolescence is a stage of changes in body and behaviour that may affect mental health. We found that no study measures the depression and anxiety in adolescence in our region, so we want to measure it and then try to improve our community. **Aim:** We aim to estimate the prevalence of depression and anxiety among high school students at Qassim region. **Methods:** A cross-sectional study done in al-Qassim region. A targeted population was secondary school students. The sample size was 1245 students. We used the questionnaire tool the Patient Health Questionnaire (PHQ-9) to assess depression in the students and the GAD7 for anxiety. The data had been gathered through MS Excel then exported to the Statistical Packages for Social Sciences (SPSS) for analyses. A *P* value cut-off point of 0.05 at 95% confidence interval (CI) was used to determine statistical significance. The analyses measure the association between socio-demographic and other related variables in the survey by using a Chi-square test. **Result:** Our study shows that depression by using (PHQ-9) among the 1245 students, 325 (26.0%) were not depressed, 423 (34%) were mildly depressed, 306 (24.6%) were moderately depressed, whereas 129 (10.4%) were moderately severe depressed and 62 (5.0%) were severely depressed. Anxiety by using the GAD-7 questionnaire, it was revealed that out of 1245 students, 455 (36.5%) of them were without anxiety, 425 (34.1%) of them were having mild anxiety, 243 (19.5%) of them were having moderate anxiety and 122 (9.8%) were having severe anxiety. Depression and anxiety, according to gender (*P* value <0.001), show a significant relationship. **Conclusion:** We have to raise the awareness of the mental health in our community as the prevalence of mental disorder has significantly increased over time. Health services should make health education for students on how they deal with stress and depression through exercise and good sleep.

Keywords: Anxiety, depression, psychiatry, high school, PHQ-9, GAD7

Introduction

One of the most important stages of life is adolescence, and since it is so important we should focus our efforts to solve the challenging conditions like depression, anxiety and stress. It is not that simple on an account of the multifactorial changes that are taking place in that period such as biological, physiological and psychological. Psychiatric disorders in this period are a major public health concern because of their impact on the life in almost every aspect from poor academic performance, substance abuse to the suicide attempts.[1,2]

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According to the World Health Organization (WHO) reports, community-based studies revealed an overall prevalence rate for mental disorders around 20% in several national and cultural contexts.[3] An earlier study on Saudi secondary school boys indicated that 38.2% had depression, while 48.9% experienced anxiety and 35.5% suffered from stress.[2] Another study was done on girls in Abha showed that depression was accounted as 41.5%, anxiety was 66.2% and 52.5% experienced stress.[4]

About 50% of adult sufferers of anxiety disorders identify that their symptoms began in childhood. Furthermore, the stress is escalating at an alarming rate among adolescents according to many researchers.[2] Depression (major depressive disorder),

is a major cause of disability and suicide, has a prevalence of 5% in the general population and approximately 10–20% in chronically ill medical outpatients. The feelings of sadness and/or a loss of interest in activities once enjoyed can cause depression. Also, it is linked to a variety of emotional and physical problems and can decrease a person's ability to function at work and home.[5,6]

Anxiety is a large heading where disorders such as general anxiety; social anxiety are part of it. It is manifested as nervousness, apprehension, fear and worrying. Besides, it may cause physical symptoms and disturbance. A mild form of anxiety is hazy and disturbed, while severe anxiety can impair the normal function of life.[7]

Method

Study design

A cross-sectional study was undertaken in the duration from February 2018 until May 2018 among high school students in Qassim Region, KSA.

Population and sample

The study population included most of the high schools in Qassim Region. The exclusion criteria were students with intellectual disabilities. The total number of participants was 1245 students.

Data collection instruments

To assess the depression of the students we used questionnaire tool the Patient Health Questionnaire (PHQ-9).[8] The PHQ-9 is the depression module, which scores each of the nine Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM–IV) criteria as '0' (not at all) to '3' (nearly every day). It has been validated for use in primary care.[9]

The results had been recorded into five categories such as 0–4 as 'none,' 5–9 as 'mild,' 10–14 as 'moderate,' 15–19 as 'moderately severe' and 20–27 as 'severe.'[8]

Whereas to evaluate the anxiety of students we applied the General Anxiety Disorder (GAD-7) survey tool, this is calculated by assigning scores of 0, 1, 2 and 3 to the response categories of 'not at all,' 'several days,' 'more than half the days' and 'nearly every day,' respectively. GAD-7 total score for the seven items ranges from 0 to 21. Scores of 5, 10 and 15 represent cut-off points for mild, moderate and severe anxiety, respectively.[10]

Data analysis

The data had been gathered through MS Excel and after data cleaning and data re-coding, it was then exported to the Statistical Packages for Social Sciences (SPSS) for further tabulation and subsequently for statistical data analyses. Both descriptive and inferential statistics had been conducted. A *P* value cut-off point of 0.05 at 95% confidence interval (CI) was used to determine statistical significance. The analyses measure the association between socio-demographic and other related variables in the survey by using a Chi-square test.

Ethical Considerations

The researchers explained to the participants the important information about this study. Then, the participants were asked to carefully read the consent form, before they agreed to participate in this study. Confidentiality of the participants was ensured. This research was approved by the Regional Ethical Committee in thePrince Noura University.

Results

There were 1245 participants who were recruited in this study, age range was from 13 to 19 years old of whom majority were 17 -18 years old group (55.7%). Females were higher compared to males (55.6% vs 44.4%). Further details of the socio demographic characteristics were elaborated at Table 1. Figure 1 presented the distribution of students' depression using the PHQ-9 questionnaire.

Figure 2 shows the distribution of students' anxiety using the GAD-7 questionnaire.

We used the Chi-square test in Table 2 to assess the relationship between the level of depression and the socio-demographic characteristics of students with *P* values which indicates whether the relationship is statistically significant. A *P* value of ≤0.05 has been used as a significant level for all statistical tests. About 17–18-year old were higher in all level of depression compared to other age categories, however, its association was not statistically significant (*P* value 0.176). Females were predominantly higher than males in all levels of depression with the exception of those without depression where males (57.8%) were slightly higher than females (42.2%) and it shows positive association (*P* value <0.001). In the place of residence, student living in Buraidah were dominantly higher in all depression categories in comparison to other places of residence and the test revealed a significant difference (*P* value <0.001). Pertaining to the type of education system, the syllabus system was superior in all level of depression opposite to other categories of the education system but we failed to prove its association (*P* value 0.305). In regards to educational level, third-year were dominantly depressed among the other year level. However,
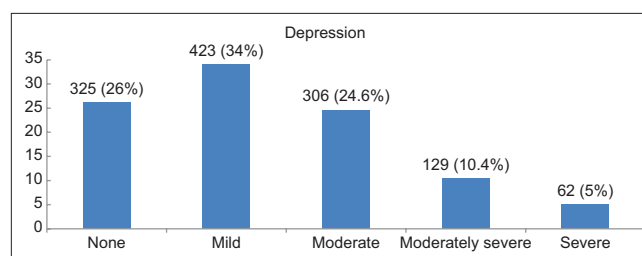

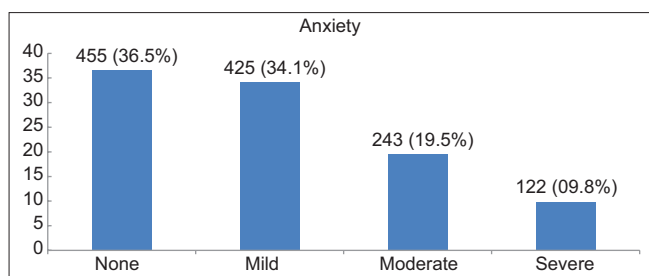**Figure 1:** Distribution of students' depression using the PHQ-9

Figure 2: The distribution of students' anxiety using GAD-7 questionnaire

Table 1: Descriptive analysis for socio-demographics variables	
Study variables	*n* (%) (*n*=1245)
Age group in years	
13-14 years old	40 (3.2)
15-16 years old	265 (21.3)
17-18 years old	694 (55.7)
≥19 years old	246 (19.8)
Gender	
Male	553 (44.4)
Female	692 (55.6)
Place of residence	
Al Foura	56 (4.5%)
Al Khabra	82 (6.6)
Almlida	129 (10.4)
Arras	132 (10.6)
Badaya	145 (11.6)
BUKAYRIYAH	198 (15.9)
Buraidah	358 (28.8)
Unaizah	113 (9.1)
Uyon AlJiwa	32 (2.6)
Type of education system	
General	529 (42.5)
Syllabus system	662 (53.2)
The Holy Quran school	54 (4.3)
Educational level	
First year	202 (16.2)
Second year	287 (23.1)
Third year	756 (60.7)
Marital status	
Single	1201 (96.5)
Married	40 (3.2)
Divorced or widowed	4 (0.3)

the analysis revealed that educational level was not statistically associated with depression. Single status was far off depressed compared to married and divorced/widowed and its association was negative (*P* value 0.255). Students with mild anxiety were higher in all level of depression except for those without anxiety where it registered far higher than mild, moderate and severe. The analysis revealed that the level of anxiety has a strong relationship with the level of depression.

Table 3 presented the relationship between the level of anxiety and socio-demographic characteristics of students. In this table, we also applied a Chi-square test with *P* values which

indicates whether the relationship is statistically significant. We used $P \leq 0.05$ as a cut-off point for a significant level. About 17–18-year old were superior in all level of anxiety compared to other age categories, however, its relationship was not statistically significant (*P* value 0.341). Females were higher than males in all levels of anxiety except for those without anxiety where males (53.2%) were slightly upper than females (46.8%), and it shows strong association (*P* value <0.001). In the place of residence, student living in Buraidah were dominantly higher in all level of anxiety compared to other places of residence, and the test revealed statistically significant (*P* value <0.001). Concerning the type of education system, the syllabus system was more in all level of anxiety in comparison to other categories of the education system and it shows positive association (*P* value 0.022). In regards to educational level, a third-year level was the most anxious among the other year level. However, the analysis revealed that educational level was not statistically associated with anxiety. In marital status, single status was far anxious compared to married and divorced/widowed and its association was strongly positive (*P*-value 0.001).

Discussions

Depression, anxiety and stress are increasing among adolescents (Institute for Health Metrics and Evaluation, 2013).[11] This study will further exemplify the prevalence of depression, anxiety and stress among students here in Saudi Arabia. Our study assessed the students' depression and anxiety by using the PHQ-9 questionnaires as well as the GAD-7 questionnaires.[12,13] We trust that this is the first paper in Saudi Arabia to assess the prevalence of depression and anxiety using this version of questionnaires as most of the papers published have utilized the Depression, Anxiety and Stress Scale (DASS) questionnaires.[14-22] Overall depression shows 26% were not depressed, 34% were mildly depressed, 24% were moderately depressed with 10.4% of moderately depressed and 5% who had severe depression whereas students' anxiety shows 36% were without anxiety, 34% were with mild anxiety with 19% were having moderate anxiety and a relatively low percentage of severe anxiety with only 9%. This study also shows a significant relationship between gender, place of residence versus the level of depression. When measuring the relationship between socio-demographic variables and level of anxiety, gender, place of residence, type of education system and marital status indicated a significant relationship. Furthermore, when assessing the association between levels of depression versus levels of anxiety, we discover that there was a respectable variation between the two outcomes.

In a study conducted at Jizan, Saudi Arabia, where they have assessed the depression, anxiety and stress among Saudi secondary school students.[23] They randomly selected four secondary schools (two for boys and two for girls). They found out that of 772 students, 50% of them had symptoms of depression, 59% had symptoms of anxiety, while 39% had symptoms of stress. They also observed that gender had a significant relationship with depression, anxiety and stress.

Characteristics	None (*n*=325) n (%)	Mild (*n*=423) n (%)	Moderate (*n*=306) n (%)	Moderately severe (*n*=129) n (%)	Severe (*n*=62) n (%)	*P*-value§
Table 2: Relationship between depression and socio-demographic characteristics (*n*=1245)						
Age group in years						
13-14 years old	15 (4.6)	15 (3.5)	07 (2.3)	2 (1.6)	1 (1.6)	0.176
15-16 years old	77 (23.7)	91 (21.5)	67 (21.9)	19 (14.7)	11 (17.7)	
17-18 years old	173 (53.2)	237 (56.0)	164 (53.6)	87 (67.4)	33 (53.2)	
≥19 years old	60 (18.5)	80 (18.9)	68 (22.2)	21 (16.3)	17 (27.4)	
Gender						
Male	188 (57.8)	193 (45.6)	125 (40.8)	31 (24.0)	16 (25.8)	<0.001**
Female	137 (42.2)	230 (54.4)	181 (59.2)	98 (76.0)	46 (74.2)	
Place of residence						
Al Foura	19 (5.8)	27 (5.7)	11 (3.6)	2 (1.6)	0	<0.001**
Al Khabra	14 (4.3)	36 (8.5)	20 (6.5)	7 (5.4)	5 (8.1)	
Almlida	13 (4.0)	41 (9.7)	56 (18.3)	16 (12.4)	3 (4.8)	
Arras	34 (10.5)	39 (9.2)	30 (9.8)	21 (16.3)	8 (12.9)	
Badaya	43 (13.2)	49 (11.6)	33 (10.8)	15 (11.6)	5 (8.1)	
BUKAYRIYAH	71 (21.8)	63 (14.9)	36 (11.8)	17 (13.2)	11 (17.7)	
Buraidah	87 (26.8)	127 (30.0)	85 (27.8)	35 (27.1)	24 (38.7)	
Unaizah	35 (10.8)	35 (8.3)	25 (8.2)	12 (9.3)	6 (9.7)	
Uyon AlJiwa	9 (2.8)	9 (2.1)	10 (3.3)	4 (3.1)	0	
Type of education system						
General	127 (39.1)	182 (43.0)	139 (45.4)	52 (40.3)	29 (46.8)	0.305
Syllabus system	178 (54.8)	221 (52.2)	156 (51.0)	75 (58.1)	32 (51.6)	
The Holy Quran school	20 (6.2)	20 (4.7)	11 (3.6)	2 (1.6)	1 (1.6)	
Educational level						
First year	66 (20.3)	63 (14.9)	45 (14.7)	15 (11.6)	13 (21.0)	0.205
Second year	66 (20.3)	103 (24.3)	70 (22.9)	37 (28.7)	11 (17.7)	
Third year	193 (59.4)	257 (60.8)	191 (62.4)	77 (59.7)	38 (61.3)	
Level of anxiety						
None	263 (80.9)	164 (8.2)	25 (8.2)	2 (1.6)	1 (1.6)	<0.001**
Mild	55 (16.9)	198 (46.8)	139 (45.4)	30 (23.3)	3 (4.8)	
Moderate	4 (1.2)	56 (13.2)	115 (37.6)	56 (43.4)	12 (19.4)	
Severe	3 (0.9)	5 (1.2)	27 (8.8)	41 (31.8)	46 (74.2)	

§*P*-value has been calculated using a Chi-square test. **Significant at *P*≤0.05

However, their study realized that age in years does not seem to have a significant effect among the outcome variables. This study result is incongruent to our outcome, with only a slight difference in the manner of measuring the mental disorder of the student as the latter they used the DASS questionnaires. Another researcher from Asir Region, Saudi Arabia where he published an article entitled 'Depression, anxiety, and stress among Saudi Adolescent school boys.'[24] The study was to determine the prevalence rates and severity of depression, anxiety and stress among Saudi adolescent boys. Using the DASS questionnaires as a tool, the results of his project showed, among 1723 male students, 59.4% had at least one of the three disorders, 40.7% had at least two and 22.6% had all the three disorders. Moreover, more than one-third of the participants (38.2%) had depression, while 48.9% had anxiety and 35.5% had stress. Depression, anxiety and stress were strongly, positively and significantly correlated. We believe that the prevalence of depression and anxiety in our study were slightly higher than his results as the depression in our study were almost three-fourth of the total number of students which we categorized from mild to severe depression with only 26% who were not having any symptoms of depression, whereas we also deemed higher in anxiety result

as all students were suffering from anxiety categorized from mild to severe. In the correlation matrix, both of our projects viewed on the same page where we showed that depression and anxiety were both statistically associated. Another author from Jeddah, Saudi Arabia, investigated the perceived depression, anxiety and stress among Saudi postgraduate orthodontic students where she also used the DASS as a survey tool.[25] This cross-sectional survey was conducted in three dental schools in different regions of Saudi Arabia; Riyadh (Central Region), Jeddah (Western Region) and Dammam (Eastern Region). The findings of her study shows (40.5%) of the participants had depression at mild levels, while more than a half (51.9%) of the participants experienced stress at moderate levels. Very few participants exhibited depression, anxiety and stress at extremely severe level (2.5%, 6.3% and 2.5%, respectively). Further results revealed that both males and females, and students in each year of study similarly experienced the three emotional states from moderate to severe levels. However, no significant difference was found between these groups for the depression and stress scores. This study result is conforming to our findings aside from the relation of two groups of students' depression and anxiety where we found both of them were statistically associated, whereas

Table 3: Relationship between anxiety and socio-demographic characteristics (*n*=1245)					
Characteristics	None (*n*=455) *n* (%)	Mild (*n*=425) *n* (%)	Moderate (*n*=243) *n* (%)	Severe (*n*=122) *n* (%)	*P*-value[§]
Age group in years					
13-14 years old	17 (3.7)	12 (2.8)	9 (3.7)	2 (1.6)	0.341
15-16 years old	108 (23.7)	85 (20.0)	53 (21.8)	19 (15.6)	
17-18 years old	254 (55.8)	232 (54.6)	134 (55.1)	74 (60.7)	
≥19 years old	76 (16.7)	96 (22.6)	47 (19.3)	27 (22.1)	
Gender					
Male	242 (53.2)	189 (44.5)	87 (35.8)	35 (28.7)	<0.001**
Female	213 (46.8)	236 (55.5)	156 (64.2)	87 (71.3)	
Place of residence					
Al Foura	26 (5.7)	19 (4.5)	8 (3.3)	3 (2.5)	<0.001**
Al Khabra	26 (5.7)	32 (7.5)	16 (6.6)	8 (6.6)	
Almlida	19 (4.2)	69 (16.2)	33 (13.6)	08 (6.6)	
Arras	43 (9.5)	42 (9.9)	26 (10.7)	21 (17.2)	
Badaya	54 (11.9)	50 (11.8)	32 (13.2)	9 (7.4)	
BUKAYRIYAH	93 (20.4)	56 (13.2)	32 (13.2)	17 (13.9)	
Buraidah	135 (29.7)	113 (26.6)	69 (28.4)	41 (33.6)	
Unaizah	45 (9.9)	34 (8.0)	21 (8.6)	13 (10.7)	
Uyon AlJiwa	14 (3.1)	10 (2.4)	6 (2.5)	2 (1.6)	
Type of education system					
General	173 (38.0)	196 (46.1)	103 (42.4)	57 (46.7)	0.022**
Syllabus system	254 (55.8)	210 (49.4)	134 (55.1)	64 (52.5)	
Holy Quran school	28 (6.2)	19 (4.5)	6 (2.5)	1 (0.8)	
Educational level					
First year	84 (18.5)	66 (15.5)	33 (13.6)	19 (15.6)	0.545
Second year	102 (22.4)	94 (22.1)	65 (26.7)	26 (21.3)	
Third year	269 (59.1)	265 (62.4)	145 (59.7)	77 (63.1)	

[§]*P*-value has been calculated using a Chi-square test. **Significant at *P*≤0.05

the latter found no significant difference between depression and stress score.

In India, the prevalence of the DASS was significantly higher in females. Around four-fifths of the respondents had at least one of the studied disorders and 34.7% of the respondents had all the three negative states. For depression and anxiety, the peak age was 18 years.[22,26] Whereas in Iran, 24.9% of students suffered from stress, 21.6% from depression and 20.2% had anxiety. Meantime, there was a reliable relation between 'family relationship status of students' and depression (*P* = 0.0001) and anxiety (*P* = 0.05).[27] In Turkey, they also reported that the prevalence of depression was higher in females than males, with one-third of the total sample was depressed which was collected using the Beck Depression Inventory (BDI) which consisted of 27 items.[28] We viewed that these international studies were symmetrical to the outcome of our paper where we also demonstrate in the table that females were more depressed compared to males and that their mental states get affected as their ages increased.

In Belgrade, Serbia, an article published regarding the factors associated with the depression, anxiety and stress among a high medical school of professional studies students.[29] Their finding shows that among 535 students they surveyed, 13.6% of the examined student population had symptoms of depression, 25.6% had symptoms of anxiety and 26% had symptoms of stress, which were varying from mild to extreme. They also

found out that both depression and anxiety were significantly correlated with the gender but no significant difference in age. Also in Brazil, a group of researchers measured the depression, stress and anxiety in medical students.[30] They reported 34.6% reported depressive symptomatology, 37.2% showed anxiety symptoms and 47.1% stress symptoms. When assessing the relationship between each predictor, they found a significant difference between each variable. Gender also indicates a significant association between depression and stress. Moreover, in China, one of the studies published tackling prevalence and related risk factors of anxiety and depression among Chinese college freshmen.[31] They accounted that 65.55% of freshmen had depression and 46.85% had anxiety. Minority status, low family income and religious belief were significantly associated with current mental health problems. These findings indicate that mental disorders are highly prevalent among the freshman student population. These study findings are comparable to our results where we showed the same pattern of prevalence of mental disorder and its correlation against the socio-demographic variables. Although some countries were showing increase in anxiety to some extent, we generalized that the prevalence of mental disorder is growing as the student goes further in school.

Conclusion

Parents should be more aware of the mental status of their children especially during adolescence as the prevalence of mental disorder

has significantly increased over time. In school, teachers should ascertain students' attitude and behaviour at all times while under their watch (during exams, marks, friendship, general health and interest). Maintaining a good teacher–student relationship will be beneficial in the long run. Parents and teachers' collaboration on nurturing students' good behaviour will decrease the prevalence of depression, anxiety and stress among students in the society.[27]

Recommendation

We have to improve the mental health of our community by giving courses to parents and teachers. The Ministry of Health and Ministry of Education should put hands together to enhance the students quality of life. We must orient the students on how to deal with stresses. Further studies can help which type of prevention and intervention can be used to decrease the burden of students depression and anxiety.

Conflicts of interest

There are no conflicts of interest.

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