Prevalence and associated factor of depression symptoms among female secondary school students in Buraydah City, Saudi Arabia

Ghadeer S. Alenzi¹, Amel A. Suliaman²

¹Department of Family Medicine, Family Medicine Academy, Qassim Health Cluster, ²Department of Community Medicine, Family Medicine Academy, Qassim Health Cluster, Buraidah, Saudi Arabia

ABSTRACT

Background: Nowadays depression is becoming one of the commonest and growing chronic disorders worldwide, especially in adolescents since they go through a sensitive stage with many physical, psychological, and cognitive changes. Prevalence of depression rises substantially throughout adolescence with female preponderance. Objective: This study aimed to estimate the prevalence and identify the risk factors of depression among secondary school girls in Buraydah, Al-Qassim Region, Saudi Arabia. Subject and Methods: A descriptive, cross-sectional study was carried out in secondary school girls section aged 15–19 years living at Buraydah city. A structured pretested questionnaire was used to collect data from 236 female students from 10 secondary schools. Data were analyzed using SPSS version 21. Written consent was taken before filling the questionnaire. Results: The prevalence rate of depression was 21.6%. Out of 51 depressed students, 23 (45.1%) have moderately severe depression and 19 (37.3%) were severely depressed. Only 9 (17.6%) were mildly depressed. A significant statistical relationship was detected between depression and risk factors such as the personal history of depression, exposure to sexual assault exposure to emotional or physical violence, losing a loved one, family, relative, or friend, and negative family relationship (P value < 0.05). No statistically significant relationship was found between depression and sociodemographic characteristics. Conclusion: The present study indicates that depression is as prevalent among secondary school girls as almost one in five was reported depression. We need more studies to measure the prevalence and determine risk factors for depression in adolescents in this region and other regions. The need is for educational programs about depression, impact, and risk factors for adolescents, parents, and teachers.

Keywords: Adolescence, depression, Saudi Arabia

Introduction

Nowadays, depression is becoming one of the commonest and growing chronic disorders worldwide.¹² The World Health Organization has described depression as the fourth leading cause of illness and disability among adolescents aged 15–19 years.²³ Worldwide 10%–20% of children and adolescents experience behavioral problems or mental disorders.²⁴ Prevalence of depression rises substantially throughout adolescence with female preponderance (about 2:1 male to female ratio).²⁵

Adolescent depression results in irritable (rather than low mood) behavior, loss of interest, fatigue, change in appetite and/or sleep, decreased concentration, and suicidal thought.²⁶ These symptoms may be ignored and considered as irritability and mood swings of adolescents or hormonal changes.²⁷ Depression placing adolescents at greater risk for psychological, social functioning and...
Subject and Methods

Out of 75 female secondary schools, 15 schools were selected randomly to participate in this study. First, we plan to enroll the girl students from the selected schools by simple random sampling methods based on the inclusion criteria. But due to the COVID-19 pandemic and the lockdown, schools were closed and shifted to online learning; as a result of this situation, we could not be able to access the participants and collect data by direct interview. Based on this unusual situation, we change the strategy of data collection from participants’ interviews into an online survey. Accordingly, the questionnaire redesigned using Google sheet.

The questionnaire was piloted on 30 female students, and it was in a similar environment for teenage female students. The female students and the schools in which they were piloted were excluded from the sample because a few questions of the questionnaire needed some modification.

After approval from the school authorities, the electronic survey was sent through social media (WhatsApp) for all levels and classes in the selected school. The questionnaire consisted of three sections: sociodemographic features, a patient health questionnaire (PHQ-9), and an assessment of risk factors. The sociodemographic profile consisted of some variables such as age, nationality, marital status, parents’ education, family income, previous personal or family history of depression, school grade, and academic scores. The second part was to assess the risk factors related to depression among the respondents, which was constructed based on the literature reviews of related research, such as the relationship with teachers and classmates, relationship with family members, physical, sexual, and verbal abuse, stressful life events, contentment with body images, and history of chronic disease for participants and their families.

The third part of the questionnaire was to assess the symptoms of depression in participants using the Arabic version patient health questionnaire (PHQ-9), as the sensitivity and specificity of the PHQ-9 among adolescents are similar to those of adult populations.

Data Management and Analysis Plan

The data were collected in an Excel sheet, coded, validated, and then imported into SPSS version 21, for Windows (SPSS, Inc., Chicago, IL, USA) for analysis. The main variables analyzed were sociodemographic characteristics, family history of depression, and the factors for depression. A Chi-squared test was used to compare the association between two proportions. A P value of ≤0.05 was considered statistically significant.

The PHQ-9 Patient Depression Questionnaire was used in this survey; it includes nine questions used to assess the depression status for the last two weeks of the respondents. For the initial diagnosis of depression, the respondent those answered yes for at least four questions out of nine, including mainly questions 1 and 2, were considered depressive.

Scoring of depression severity based on the HQ9 was on the following table:

| Total score | Depression severity       |
|------------|--------------------------|
| 1–4        | Minimal depression       |
| 5–9        | Mild depression          |
| 10–14      | Moderate depression      |
| 15–19      | Moderately severe        |
| 20–27      | Severe depression        |

Ethical considerations

Institutional Ethical Committee approval was taken from Qassim Regional Ethics Committee (Letter No: 1440-1411706, Monday, March 11, 2019). A permission letter from the Education Department at the Buraydah sector was sent to the participating schools prior to the conduction of this research. Consent and voluntary participation were added at the beginning of the questionnaire, and the students were briefed on the aim of the study and were also assured that the questionnaire was anonymous and confidential.

Results

A total of 236 adolescents, consisting of females only, were studied. The characteristics of respondents and analysis of the questionnaire are described below.

Sciodemographic characteristics

In this study, age ranged from 15 to 19 years. The average age was 17.1 (SD ± 1.04) years. Most of the girl students, i.e., 203 (86.0%), were in the age group between 16 and 18 years. While a few of them were at the age of 15 years and 19 years, 11 (4.7%), and 22 (9.3%) respectively [Figure 1] most of the respondents were Saudi 228 (96.6%) [Table 1]. About half of female students 109 (46.2%) were in the 12th grade. The rest of the students were in the 11th grade 68 (28.8%) and 10th grade 59 (25.0%) [Table 1]. A higher percentage of female secondary school students 136 (57.6%) had an excellent academic score. About 70 (29.7%) of them obtained very good scores, 23 (9.7%) had good scores, and a few of them, i.e., 6 (2.5%), of them had fair scores. Only one (0.4%) female student was a repeater [Table 1]. More than half, i.e., 155 (65.7%), of the female secondary schools have...
5–10 siblings. About 66 (28%) of them had <5 siblings and only 15 (6.4%) had more than 10 siblings. The majority of the students were in the middle order of siblings 135 (57.2%), 47 (19.9%) were the eldest, and 54 (22.9%) were the youngest [Table 1]. Most of female students were single 232 (98%), only 4 (2%) of them were married [Figure 2]. The majority of the participating students live with their parents, 197 (83.5%), followed by living with only the father 27 (11.4%), and a few of them live with their mother only 6 (2.5%) or others 6 (2.5%) [Table 1]. Most of the students’ parents have a primary and secondary education level, from their fathers and mothers.

Regarding the socioeconomic status, the respondents showed different responses. The majority of them are residents in villa 182 (77.1%), while the rest are living either in apartment 26 (11%) or one floor flat 26 (11%).

Regarding monthly income and fathers’ occupation, about half of the students’ father has a government job 97 (41.1%), whereas some are working in private sector 50 (21.2%). The total monthly income of the respondents varied, the highest percentage reported was 30.5% for those who had a monthly family income between 5001–10,000 SR. Few of them said they do not know their monthly income 12 (5.1%). There is no statistically significant relationship between depression prevalence and all sociodemographic characteristics [Table 7].

**Depression assessment**

The prevalence rate of depression was 51 (21.6%), where 78.4% not depressed. According to PHQ 9, the depression classification was ranged into five categories from minimal to severe depression. 23 (45.1%) were moderately severe depression and 19 (37.3%) were severely depressed. Only 9 (17.6%) were mildly depressed. Most of the participants, i.e., 103 (43.6%), faced somewhat difficult to deal with any problem [Tables 2-4].

192 (81%) had no family history of psychological disorders, while less than one-third of them had a positive family history of psychological disorders 44 (19%) [Figure 3]. 56.8% of them had a family history of depression, 27.3% had a family history of anxiety, and 16.5% had a family history of obsessive–compulsive disorder, while only one female student had a family history of 2.3% schizophrenia [Table 2].

| Characteristics | Frequency (n) | Percentage (%) |
|-----------------|--------------|----------------|
| Age Mean (±SD)  | 17.1 (±1.04) years |                |
| Nationality     |              |                |
| Saudi           | 228          | 96.6           |
| Non-Saudi       | 8            | 3.4            |
| Marital status  |              |                |
| Married         | 4            | 2              |
| Unmarried       | 232          | 98             |
| Education level/school grades | | |
| 10th grade      | 59           | 25.0           |
| 11th grade      | 68           | 28.8           |
| 12th grade      | 109          | 46.2           |
| Academic performance | | |
| Excellent       | 136          | 57.6           |
| Very good       | 70           | 29.7           |
| Good            | 23           | 9.7            |
| Fair            | 6            | 2.5            |
| Repeater        | 1            | 0.4            |
| Number of siblings |            |                |
| <5 Siblings     | 66           | 28             |
| 5-10 Siblings   | 155          | 65.7           |
| >10 Siblings    | 15           | 6.4            |
| Order of respondent among sibling | | |
| Eldest          | 47           | 19.9           |
| Middle          | 135          | 57.2           |
| Youngest        | 54           | 22.9           |
| Living with     |              |                |
| Parents         | 197          | 83.5           |
| Father only     | 27           | 11.4           |
| Mother only     | 6            | 2.5            |
| Others          | 6            | 2.5            |
| Fathers’ education level | | |
| Primary and Secondary schools | 129 | 54.6 |
| Diploma         | 17           | 7.2            |
| Bachelor        | 63           | 26.7           |
| Post-graduation | 27           | 11.4           |
| Mothers’ education level | | |
| Illiterate      | 5            | 2.1            |
| Primary and Secondary schools | 133 | 56.4 |
| Diploma & Bachelor | 88   | 37.3           |
| Post-graduation | 10           | 4.2            |
| Fathers’ occupation | | |
| Governmental employee | 97 | 41.1 |
| Private employee | 50           | 21.2           |
| Unemployed      | 30           | 12.7           |
| Others          | 59           | 25.0           |
| Types of accommodation | | |
| Villa           | 182          | 77.1           |
| Apartment       | 26           | 11.0           |
| One floor flat  | 28           | 11.9           |
| Total Monthly income | | |
| <5000 SR        | 43           | 18.2           |
| 5001-10,000 SR  | 72           | 30.5           |
| 10,001-15,000 SR| 43           | 18.2           |
| >15000 SR       | 66           | 28.0           |
| I don’t know    | 12           | 5.1            |
Exposure to risk factors

A personal history of depression or anxiety was the highest factor reported 72% compared to other factors. The participant's dissatisfaction with body image was also found to be a high 70.8% factor. More than half of female students were exposed to bullying by 50.8%. About 45.8% of them were exposed to emotional or physical violence, and 42.4% tended to harm themselves or committing suicide. On the other hand, the exposure to sexual assault 27.5%, poor relationship with parents 22.9%, peers 15.7%, and teachers 11.9%, in addition to the history of chronic diseases or neurological diseases 10.2% were the least risk factors mentioned by the participants [Table 5]. There was a statistically significant relationship between some risk factors and depression rate such as exposure to sexual assault ($P = 0.035$), exposure to emotional or physical violence ($P = 0.015$), having a personal history of depression or anxiety ($P = 0.001$), losing a loved one, family, relative, or friend ($P = 0.005$), negative family relationship ($P = 0.017$), not having good relationships with the peers ($P = 0.002$), and unsatisfaction with body image ($P = 0.013$) [Table 6]. Whilst

Parent or sibling depression history, Personal history of chronic disease or neurological disease, no good relationships with teachers, and family history of the chronic or nervous disease are found to be not statistically significant for depression prevalence [Table 7].

Discussion

Depression is one of the commonest psychological disorders and the leading cause of illness and disability among adolescents.\(^2\)

The ages of adolescents in the current study sample ranged from 15 to 19. A total of 236 adolescents, consisting of females only, were studied. The mean age of the study participants was 17.1 years (SD ± 1.04). The prevalence of depression in this study is 21.6%. This is a high percentage that may affect their social and academic life as compared to other international studies; this percentage is higher than in the studies conducted in the United States, England, and Nepal, which reported a prevalence of 17.3%, 4.8%, and 11.1%, respectively.\(^6-8\) However, the percentage in the current study is less than that reported by a study done in India that reporting that two-fifths (40%) of adolescents had depressive disorders.\(^9\) The prevalence of depression in this study is in line with the results revealed by previous Saudi studies, which showed a high prevalence among adolescents in general, and among girls in particular, with an approximate range of (13%–42.9%).\(^10-12\)

The prevalence of depression is higher in the current study compared to other studies could be due to several reasons. First, the current study is conducted on female adolescents only, where several local and international studies have shown that the prevalence of depression is higher among females than among males.\(^7,10\) Second, we used a self-administered electronic questionnaire (GHQ-9) that may lead to minimal resistance in answering and better reporting by the respondents. Another important point we conducted in this
study at a time of the spread of Covid-19 pandemic which may affect adolescents’ mental health: The central disease control and prevention has reported that the Covid-19 pandemic can affect adolescents’ social, emotional, and mental well-being. Also, this difference may have attributed due to diverse geographical environments and economic and cultural characteristics in the methodology used. According to social demography, they all failed to show a statistically significant correlation between rates of depression in adolescents, which was supported by another study done by Dipal Patel among school-going adolescents of Rajkot, Gujarat, India. However, the prevalence of depression higher among students of 12th class may be due to stress related to performance; this finding was similar to a previous study conducted in India. Also, this study showed that adolescents were from low-income families (<5000 riyals/month), and those whose families lived in apartments also had higher rates of depression. Although it is not significant statistically, the relationship between depression and low income has been described in previous studies conducted among adolescents with a family income of <5000 SR; \( P = 0.027 \), as well as those whose families were living in apartments. Our study did not find a statistically significant relationship between depression prevalence and age, family size, birth order, according to risk factors in the present study. There was a statistically significant relation between exposure to sexual assault (\( P = 0.035 \)), exposure to emotional or physical violence (\( P = 0.015 \)), having a personal history of depression or anxiety (\( P = 0.001 \)), losing a loved one, family, relative, or friend (\( P = 0.005 \)), negative family relationship (\( P = 0.017 \)), not having good relationships with the peers (\( P = 0.002 \)), and unsatisfied with body image (\( P = 0.013 \)) and depression rate. These finding were similar to study done in Turkish. Early conducted studies in Saudi Arabia and Oman support that not having good relationships with peers and family, not being happy with their body images, history of psychiatric illness, and history of relative loss as statistically significant risk factors. The limitation of the study was: confirmation of the diagnosis was not done, it has only investigated the prevalence and risk factors for depression only among female Saudi adolescents, which might differ from the prevalence and risk factors for depression among Saudi adolescent boys. It was performed exclusively in the City of Buridah, so it did not explore the prevalence of depression and the related risk factors among rural adolescents and prevent generalizability of the results. Questionnaires were self-administered; therefore, there is a chance for reporting bias or misunderstanding of the questions. We recommend increasing efforts for adolescent depression screening in primary health centers: increasing community awareness of mental health and depression, especially teachers and parents; and conducting a nationwide survey to determine the exact extent of depression.

To conclude, depression is a widely spread condition among adolescents in Buridah. The overall prevalence of depression in high school female students by using GHQ-9 was (21.6%). Mild depression and moderately severe depression rate was more than other severity. More studies are needed to reveal the prevalence and general risk and consequences of depression,
To summarize, the prevalence of depression among adolescents in high school female students in Buridah, by using GHQ-9, it was 21.6%. The most significant risk factors associated with depression were having a personal history of depression or anxiety, losing a loved one, family, relative, or friend, negative family relationship, not have good relationships with the peers, and unsatisfied with body image.

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Table 6: Prevalence of depression among secondary school girls according to their sociodemographic characteristics (n=236)

| Sociodemographic Characteristics | Depressed student 51 (21.6%) n (%) | Nondepressed 185 (78.4%) n (%) | Total (n) | P   |
|----------------------------------|-----------------------------------|---------------------------------|-----------|-----|
| **Age**                          |                                   |                                 |           |     |
| 15-16 years                      | 13 (18.1)                         | 59 (81.9)                       | 72        | 0.30|
| 17-19 years                      | 38 (23.2)                         | 126 (76.8)                      | 164       |     |
| **Nationality**                  |                                   |                                 |           |     |
| Saudi                            | 48 (21.1)                         | 180 (78.9)                      | 228       | 0.237|
| Non-Saudi                        | 3 (60.0)                          | 5 (40.0)                        | 8         |     |
| **Marital status**               |                                   |                                 |           |     |
| married                          | 0 (0)                             | 4 (100)                         | 4         | 0.290|
| single                           | 51 (22.0)                         | 181 (78.0)                      | 232       |     |
| **School grade**                 |                                   |                                 |           |     |
| 10th                             | 10 (16.9)                         | 49 (83.1)                       | 59        | 0.059|
| 11th                             | 10 (14.7)                         | 58 (85.3)                       | 68        |     |
| 12th                             | 31 (28.4)                         | 78 (71.6)                       | 109       |     |
| **One floor flat**               |                                   |                                 |           |     |
| Villa                            | 36 (19.8)                         | 146 (80.2)                      | 182       |     |
| **Number of siblings**           |                                   |                                 |           |     |
| From 5 to 10                     | 31 (20)                           | 124 (80)                        | 155       | 0.471|
| Less than 10                     | 15 (22.7)                         | 51 (77.3)                       | 66        |     |
| More than 10                     | 5 (33.3)                          | 10 (66.7)                       | 15        |     |
| **Order of respondent among sibling** |                                   |                                 |           |     |
| Eldest                           | 7 (14.9)                          | 40 (85.1)                       | 47        | 0.378|
| Middle                           | 33 (24.4)                         | 102 (75.6)                      | 135       |     |
| Youngest                         | 11 (20.4)                         | 43 (79.6)                       | 54        |     |
| **Academic scoring**             |                                   |                                 |           |     |
| Excellent                        | 34 (25)                           | 102 (75)                        | 136       |     |
| Very good                        | 9 (12.9)                          | 61 (87.1)                       | 70        | 0.078|
| Good                             | 8 (34.8)                          | 15 (65.2)                       | 23        |     |
| fair                             | 0 (0)                             | 6 (100)                         | 6         |     |
| Repeater                         | 0 (0)                             | 1 (100)                         | 1         |     |
| **Living with**                  |                                   |                                 |           |     |
| father only                      | 7 (25.9)                          | 20 (74.1)                       | 27        |     |
| mother only                      | 1 (16.7)                          | 5 (83.3)                        | 6         | 0.814|
| Parents                          | 41 (20.8)                         | 156 (79.2)                      | 197       |     |
| other                            | 2 (33.3)                          | 4 (66.7)                        | 6         |     |
| **Income**                       |                                   |                                 |           |     |
| <5000 SR                         | 13 (30.2)                         | 30 (69.8)                       | 43        |     |
| 5001-10,000 SR                   | 18 (25)                           | 54 (75)                         | 72        | 0.308|
| 10,001-15,000 SR                 | 7 (16.3)                          | 36 (83.7)                       | 43        |     |
| >15,000 SR                       | 12 (18.2)                         | 54 (81.8)                       | 66        |     |
| I don't know                     | 1 (8.3)                           | 11 (91.7)                       | 12        |     |

*P value at level of significance <0.05
Table 7: Association of personal characteristics of the respondents with depression (n=236)

| Exposure to factors known to cause mental health illness | Depressed student | Nondepressed | Total | P       |
|---------------------------------------------------------|-------------------|--------------|-------|---------|
|                                                         | 51 (21.6%) n (%)  | 185 (78.4%) n (%) |      |         |
| Parent or sibling with depression?                       |                   |               |       |         |
| No                                                      | 34 (18.9)         | 146 (81.1)    | 180   | 0.068   |
| Yes                                                     | 17 (30.4)         | 39 (69.6)     | 56    |         |
| Have you been bullied?                                  |                   |               |       |         |
| No                                                      | 19 (16.4)         | 97 (83.6)     | 116   | 0.054   |
| Yes                                                     | 32 (26.7)         | 88 (73.3)     | 120   |         |
| Have you ever been sexually harassed?                   |                   |               |       |         |
| No                                                      | 31 (18.0)         | 140 (81.4)    | 171   | 0.035   |
| Yes                                                     | 20 (30.8)         | 45 (69.2)     | 65    |         |
| Ever experienced emotional or physical violence?        |                   |               |       |         |
| No                                                      | 20 (15.7)         | 108 (84.4)    | 128   | 0.015   |
| Yes                                                     | 31 (28.7)         | 77 (71.3)     | 108   |         |
| Have you ever had depression or anxiety?                |                   |               |       |         |
| No                                                      | 5 (7.7)           | 61 (92.4)     | 66    | 0.001   |
| Yes                                                     | 46 (27.1)         | 124 (72.9)    | 170   |         |
| Have you ever thought about harming yourself or committing suicide? |       |               |       |         |
| No                                                      | 19 (14.1)         | 116 (85.9)    | 135   | 0.003   |
| Yes                                                     | 32 (32.0)         | 68 (68.0)     | 100   |         |
| Personal history of chronic disease or neurological disease? |       |               |       |         |
| No                                                      | 44 (20.8)         | 168 (79.2)    | 212   | 0.342   |
| Yes                                                     | 7 (29.2)          | 17 (70.8)     | 24    |         |
| A family history of chronic or nervous disease?         |                   |               |       |         |
| No                                                      | 21 (16.9)         | 103 (83.1)    | 124   | 0.066   |
| Yes                                                     | 30 (26.8)         | 82 (73.2)     | 112   |         |
| Personal history losing a loved one, family, relative or friend? |       |               |       |         |
| No                                                      | 20 (15.0)         | 113 (85.0)    | 133   | 0.005   |
| Yes                                                     | 31 (30.1)         | 72 (69.9)     | 103   |         |
| A negative family relationship                          |                   |               |       |         |
| No                                                      | 33 (18.1)         | 149 (81.9)    | 182   | 0.017   |
| Yes                                                     | 18 (33.3)         | 36 (66.7)     | 54    |         |
| Not have good relationships with teachers               |                   |               |       |         |
| No                                                      | 42 (20.19)        | 166 (79.8)    | 208   | 0.149   |
| Yes                                                     | 9 (32.14)         | 19 (67.85)    | 28    |         |
| Not have good relationships with peers                  |                   |               |       |         |
| No                                                      | 36 (18.09)        | 163 (81.9)    | 199   | 0.002   |
| Yes                                                     | 15 (40.54)        | 22 (59.5)     | 37    |         |
| Are you satisfied with your bodily image?               |                   |               |       |         |
| No                                                      | 22 (31.88)        | 47 (68.1)     | 69    | 0.013   |
| Yes                                                     | 29 (17.36)        | 138 (82.6)    | 167   |         |

*P value at level of significance < 0.05

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Conflicts of interest
There are no conflicts of interest.

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