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THE PREVALENCE OF DEPRESSION AND ASSOCIATED FACTORS AMONG ADOLESCENT FEMALES IN SECONDARY SCHOOLS IN AL-KHOBAR CITY, EASTERN PROVINCE, KINGDOM OF SAUDI ARABIA

Medicine

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ABSTRACT

BACKGROUND: Globally, depression is a highly prevalent psychiatric disorder and the leading cause of disability in adolescents. This study explores the prevalence of depression and its associated factors among young females in secondary schools in Al-Khobar City, Eastern Province, Saudi Arabia.

METHOD: A prospective cross-sectional study using multistage random sampling methodology was performed, specifically targeting the city's secondary school girls. A self-administered questionnaire was distributed comprising three aspects: the collection of sociodemographic data and the application of MSPSS and BDI2.

RESULT: The prevalence of depression was found to be 23.8%, with significant association detected between age, academic performance, and level of social support; 17.4%, 3.8%, and 2.6% of the respondents reported having mild, moderate, and severe depression, respectively.

CONCLUSION: Depression in adolescence should not be underestimated. Early screening to identify depression is required for early diagnosis, treatment, and to plan preventive and control strategies.

KEYWORDS

Adolescents, high schools, depression, BDI.

1. Introduction

Depression is a substantially common psychiatric disorder in adolescents (Duthey, 2013; Verma, Jain, & Roy, 2014). The Academic Dictionary of Psychology defines depression as "a mood disorder characterized by intense feelings of sadness that persist beyond a few weeks" and, according to the World Health Organization (WHO), depression is a mental disorder that is characterized by sadness, a loss of pleasure or interest, feelings of guilt or low self-worth, disturbed appetite or sleep, feelings of tiredness, and poor concentration (WHO, 2017). Thus, it is clear that depression is a disorder that affects all aspects of individual life (actions, thoughts, and emotions).

According to the WHO, adolescence is the transition from childhood to adulthood, generally defined as occurring between the ages of 10 and 19 years of age, during which individuals experience rapid biological, psychological, social, and developmental changes. This stage is also commonly associated with a need for independence and autonomy, identity formation, and the development of privacy expectations, and many adolescents feel increased concern in regard to peer acceptance and relationships (Al-Sughayr & Ferwana, 2012).

Depression has now become the leading cause of disability in adolescents worldwide (years lived with disability); further, its prevalence rates are said to be highest in North Africa and the Middle East, which is quite pertinent to the theme of this study (Alrahili, Almatham, Bin Haamed, & Ghaziuddin, 2016; Duthey, 2013). It is also important to note that young people can express depression differently from adults, exhibiting manifest behavioral disorders such as irritability, verbal aggression, and misconduct, substance abuse, and concurrent psychiatric problems. For individuals between the ages of 12 and 18 years, the most common signs and symptoms of depression are hopelessness, social isolation, overeating and oversleeping, drug or alcohol use, suicidal thoughts, and rage (Duthey, 2013).

The main risk factors for depression in adolescents include being older, female, having experienced prior episodes of depression, having a family (especially maternal) history of depression, having a chronic medical illness, having other mental health/behavioral problems, being overweight or obese and, according to some studies, ethnicity/being a member of the Hispanic race (Siu, 2016). Further, additional psychosocial risk factors for depression include experiencing childhood abuse or neglect, being exposed to traumatic events (including natural disasters), experiencing the loss of a loved one (through death, divorce, or separation), social isolation, family conflict, low socioeconomic status, and having poor academic performance (Duthey, 2013; Joury et al., 2014; Siu, 2016).

Of the 29,369,000 citizens of Saudi Arabia, an estimated 9,689,000 are under the age of 18, which represents 30% of the entire Saudi population (UNICEF, 2016). In 2015, a cross-sectional, academic, school-based study was conducted in all 13 regions of Saudi Arabia, aiming to identify the health conditions and health-risk behaviors of adolescents in the country. A total of 12,575 adolescents participated in this research. Consequently, the research findings reported that 14.3% of the respondents stated experiencing early symptoms of depression (AlBuhairan et al., 2015); thus, if this percentage is applied to the entire population of adolescents in the country, it becomes clear that depression is a serious problem in the region.

Depression in adolescence should not be underestimated, and it is a matter of concern because of its high prevalence, risk of recurrence, and its ability to cause significant impairment across psychosocial domains for affected individuals (Khasakhala, Ndetei, Mathai, Mutiso, & Mbwayo, 2012; Wahab et al., 2013). Further, it can lead to substantial impairments to an individual's ability to fulfill his or her everyday responsibilities (Duthey, 2013) and can also interfere with interpersonal relationships, academic achievement (Naicker, Galambos, Zeng, Senthilselvan, & Colman, 2013; Sharma, 2014a), and the ability to be economically productive (Nguyen, Dedding, Pham, Wright, & Bunders, 2013).

The authors decided to conduct the current study because adolescents are an important group in society and they should be supported. They face many cultural and social changes and challenges when adjusting to life in the vast and increasingly open world, including the effects of the many wars and tragic incidents that occur in the Arab world and the impact these have on our society. These are factors that can lead to depression.

Further, few documented research studies have been performed in Saudi Arabia concerning the causes and effects of, and remedies for, psychological or mental problems and, to the researchers' knowledge, no study addressing this aspect among adolescents has previously been performed in Eastern Province.

Research Questions

- What is the prevalence of depression among adolescent females in secondary schools in Al-Khobar City, Eastern Province, Kingdom of Saudi Arabia (KSA)?
- What are the associated factors of depression among female students in secondary schools in Al-Khobar city, Eastern Province, KSA?
- What is the relationship between the prevalence of depression and social support among adolescent females in secondary schools in Al-Khobar city, Eastern Province, KSA?

Aim

To explore the prevalence of depression and its associated factors among young females in secondary schools in Al-Khobar City, Eastern Province, KSA.

2. Literature Review

In researching this topic, several similar studies performed in different cities in Saudi Arabia were found; these studies were conducted in the cities of Riyadh, Abha, and Taif.

First, three studies performed in Saudi Arabia's capital city, Riyadh, were examined. In 2015, a study was conducted on 1,028 adolescent girls aged 15–19 years in secondary schools in Riyadh; this research applied a questionnaire that featured the Beck Depression Inventory-II scale (BDI-II). The results showed that approximately 30% of the participants were depressed; further, depression was found to be more prevalent in adolescents whose household income was <12,000 Saudi Riyal/month, had a bad relationship with peers and family members, lived with a single parent or alone, had been emotionally abused, and who were exposed to physical violence (Raheel, 2015).

The next study conducted in this city applied the Arabic version of the BDI-II. The response rate for this study was 98.2%, and it reported that the prevalence of depression was almost 42% higher among female students than male students (47.7% versus 39.3%). Further, it also found that depression was reported significantly more among students aged 20 years and over (59.5%), in the third grade (55.2%), and those with either a satisfactory or poor level of school performance (80% and 77.8%, respectively) (Labban, 2016).

Lastly, the third study in Riyadh used the Arabic version of the Symptom Checklist-90-Revised (SCL 90-R), and found that 28.4% of the participants were depressed and that females were more depressed than males (Ahmed & Alrowaily, 2015). Thus, both of the latter studies concluded that the prevalence of depression among women is higher than men.

Next, three relevant studies conducted In Abha were found. In 2009, two separate studies were performed in this city on secondary-level girls. One study used the Arabic version of SCL 90-R, and it found the prevalence of depression among its sample to be 13.9% (Al Gelban, 2009). Meanwhile, the other study used the Arabic version of DASS-42, and found the prevalence of depression to be 41.5%, with the majority suffering from mild to moderate depression (Al-Gelban, Al-Amri, & Mostafa, 2009). In both studies, no significant relationship was found with sociodemographic factors. The third study was also performed in 2009, and sampled 1,552 adolescent school-age boys and girls using the Arabic version of SCL-90-R for mental health screening. Consequently, the overall prevalence of mental disorders was found to be 15.5%, and some sociodemographic conditions were found to significantly affect mental health (father's education level, whether the mother works, ranking among brothers and sisters, and type of school attended) (Mahfouz et al., 2009).

In Taif, two relevant studies were found. The first study aimed to assess the prevalence, symptomatology, and risk factors for depression, and applied the Arabic version of Beck's Depression Inventory. It analyzed 490 secondary school students, 37.6% of whom were females. Consequently, it found that 42 (22.8%) of the participants were healthy, while 68 (37.0%) had mild depression, 54 (29.3%) had moderate depression, 16 (8.7%) had severe depression, and four (2.2%) had very severe depression. Further, the most significant risk factors were identified as gender, age status among siblings, experiencing the loss of a relative, and having a history of psychiatric illness (Abdel-Fattah & Asal, 2006). The second study was performed in 2015 on 1,024 secondary school female students, also using the Beck Depression Inventory. Here, the result showed that 42.9% had significant depression (Desouky, Abdellatif, & Salah, 2015).

Next, two studies originating from Gulf countries were found. One was conducted in 2014 on students in 20 secondary schools in Dubai using the Children's Depression Inventory (CDI). The aim of this study was to assess depressive symptoms, and it consequently found that 17.5% of the students analyzed had elevated depressive symptoms. This study also found that some significant factors affect the prevalence of depression, such as type of school attended, having more than five siblings, having a bad relationship with parents, having a bad relationship with colleagues, lacking family support, and lacking peer support (Wasfy, Al Faisal, El Sawaf, Ali, & Hussein, 2014). The second study was conducted in Oman in 2006. This study also applied the CDI to high school adolescents, and found that 17.0% of the adolescents had depressive symptoms; further, being female was identified as a significant predictor of depression in adolescents. Meanwhile, having a weak relationship with family members, friends, and/or teachers was found to be a factor that contributes to the development of depression (Afifi, Al Riyami, Morsi, & Al Kharusil, 2006).

Two relevant studies were conducted in Turkey, in 2008 and 2010, respectively. The first applied a depression-rating scale, social support scale, problem-solving inventory, and an assertiveness scale, while the second used CDI. In the first study, 141 students (17.5%) were found to be depressed, and having low self-esteem, parents with a low educational level, and receiving a low level of social support from friends were found to be predictors of girls' depression. In the second study, 3,010 (39.6%) of the participants were female, and the prevalence of depression in the study was found to be 9.9% higher in girls than boys (13.5% and 7.6%, respectively). No relationship was found between depression scores and number of siblings, age status among siblings, or mothers' job status, but a weak negative correlation was found in regard to school performance, and a stronger relationship was found in regard to parents' status (alive/dead, together/separated). Further, children whose fathers were self-employed reported less depression, while children with poor economic status had higher depression levels (Bodur & Kücükkendirci, 2009; Eskin, Ertekin, Harlak, & Dereboy, 2008).

Moving further abroad, four studies originating from India and relating to adolescents were found. The first was conducted in 2010, and concerned a depression, anxiety, and stress (DAS) assessment of 242 participants using a DASS-21 questionnaire. It consequently found that females were more depressed than males ($p = 0.03$); further, the prevalence of depression ($p = 0.025$) was found to have an inverse relationship with the academic performance of the students (Bhasin, Sharma, & Saini, 2010). Another study was performed in 2012 on 3,141 students using a self-administered questionnaire featuring BDI-II, and the response rate was 99.5%. Here, the prevalence of depression was found to be 57.7%, and boys were significantly more depressed than girls. Moderate depression was the most common type, followed by mild depression and severe depression, and the least common was extreme depression. There was also a significant association with age, type of school attended, living in a nuclear family, financial status, and experience of problems at home such as quarrelling. No relationship between the fathers' education level and the occupation of both parents was found with the prevalence of depression; however, increasing mothers' educational attainment was found to be a protective factor (Nagendra, Sanjay, Gouli, Kalappanavar, & Kumar, 2012). The next study was conducted in 2014, and was performed on 300 adolescents using BDI-II. The results showed that 55% of the adolescents were depressed, with a higher prevalence among girls than boys (Sharma, 2014b). Lastly, the fourth study concerned urban areas of Tamil Nadu, India. This was conducted in 2015 and aimed to determine the depression status of adolescents in the area; here, the Goldberg Depression Questionnaire was used. Consequently, the prevalence of depression was found to be 41% more common in girls, and it was found to be significantly correlated with parental education and parents' living status in the family; that is, whether they lived together or were separated/single (Muhil, 2015).

One relevant study was found from South Korea; this was conducted in 2012 among middle and high school students ($N = 75,066$). This research aimed to assess socioeconomic and academic backgrounds, parental support, parental education level, parental support, lifestyle habits, physical activities, and experience of depression in the past year. To achieve this, a two-level multilevel analysis was used to investigate the relationship between depression and individual (level 1) and school (level 2) factors. Consequently, the study found that 43.96% of girls reported having experienced depression. In general, depression was found to be high in students living with wealthy parents, who had higher school grades, who had low academic achievement, who lived with a single parent or neither of their parents, who had parents with low educational levels, and who had parents with unhealthy habits such as smoking (Park, Heo, Subramanian, Kawachi, & Oh, 2012).

Finally, three relevant studies were found in the USA. In 2008, a longitudinal cohort study assessed 4,791 U.S. adolescents in an

attempt to identify the protective and vulnerability factors that predict new episodes of depression. The results showed that being female and having a low-income status increased the risk of depression; further, the study also found that witnessing parental conflict, experiencing a greater number of adverse events, and engaging in criminal activities increased the risk of depressive episodes. Meanwhile, parental warmth, family connectedness, better school performance, religious activities, and peer acceptance were found to be protective (Van Voorhees et al., 2008). Next, in 2009, a study examined the components of teenagers' social environments (social networks, extracurricular activities, and family relationships) and their association with depression. Specifically, 332 adolescents were examined, and the study found that teens who engaged in more extracurricular activities and those who experienced higher-quality family relationships presented with significantly fewer depressive symptoms (Mason, Schmidt, Abraham, Walker, & Tercyak, 2009). Finally, in 2010, a study was conducted on a sample of rural-school-based adolescents in order to investigate the relationships between depression and perceived social support, self-esteem, and optimism. The results found that all of these factors were protective against depression (Weber, Puskar, & Ren, 2010).

3. Methodology

3.1 Study design and data collection

- This study comprises prospective cross-sectional research conducted on 500 secondary school girls from Al-Khobar City, Eastern Province, KSA, between October 2016 and August 2017.
- In regard to participants, all girls who spoke Arabic and were enrolled in grades 10, 11, and 12 of Al-Khobar City's public and private secondary schools were targeted.
- Only students for whom consent was obtained from both themselves and their parents were included in the current study.
- After obtaining a list of the female high schools in Al-Khobar City, a multistage random sampling methodology was applied. First, of the 38 female secondary schools in Al-Khobar City, ten were randomly chosen. Then, the proportional allocation was calculated, and 25% of the total number of students was found. A list of students in grades 10–12 within each school was then obtained, and a systematic random selection was performed according to the total number of students in each school and the sample population the researchers required.

3.2 Research tool

- Research tool: A self-administered questionnaire tool was distributed in the Arabic language; this consisted of three parts: a section that collected sociodemographic data, the Multidimen sional Scale of Perceived Social Support, and BDI II, all of which have been validated in the Arabic language (Merhi & Kazarian, 2012).
- Interpretation of BDI II scores depends on the age of the respondent in question and their total score for the questions. For those aged 14 to 17, depression scoring was defined as follows: 0–25 equaled none or minimal depression, 26–35 equaled mild, 36–45 equaled moderate, and 46–63 equaled severe. Then, for those aged 18 to 22, the interpretation was that 0–20 equaled none or minimal depression; 21–29 equaled mild; 30–37 equaled moderate, and 38–63 equaled severe depression (Ghareeb, 2000).
- The questionnaire for the current study was constructed based on evidence from previous literature and consultations provided by field experts.
- Two consultants and two statisticians validated the questionnaire.
- The researcher tested the questionnaire on a similar condition of female high school students, and piloting was conducted on 10% of the sample size. The school where the piloting was performed was excluded from the actual survey.

3.3 Data management and Analysis

- The data were computerized using SPSS version 18. Meanwhile, Cronbach's alpha was used to test the reliability of the data, which was consequently found to be significant (0.715).
- Next, frequency tables were drawn (frequency and percentage) to explore the findings of the study, and cross tabulation was performed to determine the association between the demographic characteristics and depression among adolescent girls. A chi-square test was used for cross tables (contingency tables at the 95% confidence level, $p \leq 0.05$), while binary logistic regression determined the association between the demographic characteristics and depression.

3.4 Ethical considerations

- Approval was obtained from the Ministry of Education's research administration, and an approval letter was emailed to all school administrations from the research department. As mentioned above, written informed consent from both the students and their parents was received. The participants were directly informed about the aims of the study and assured of the full confidentiality of their data.

4. Results

The study was conducted among 500 high school students and had a 100% response rate. The mean age of the participants was 16.6 ± 0.95. The age group ranged from 15–19 years, and all except five girls were single. As shown in Table 1, 84% were Saudi and 16% were non-Saudi, and all were in grades 10–12. Specifically, 42% were in 11th grade, 38% were in 10th grade, and the remaining 21% were in 12th grade. Additionally, over half of the population studied, 66% (n = 330), were from public schools.

Table 1. Characteristics and demographics of the study sample (n = 500)

Characteristics of the respondents	N = 500	%
Age		
15	65	13.0
16	160	32.0
17	190	38.0
18	78	15.6
19	7	1.4
Social status		
Single	495	99.0
Married	3	0.6
Divorced	1	0.2
Widow	1	0.2
Nationality		
Saudi	421	84.2
Non-Saudi	79	15.8
Grade		
10	185	38
11	210	42
12	105	21
Type of school		
Private	170	34
Public	330	66

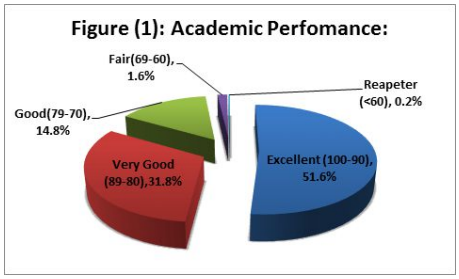
Table 2 shows the social and family characteristics of the studied sample. The first notable finding here is that over half (56%) of the participants were in the middle in terms of the order of their siblings. Further, 92% of the students lived with their parents, and 60% of them lived in a house with six–nine people. Additionally, half of the families had a budget of less than 12,000 SR, while the majority of parents had secondary-level education. Approximately half of the fathers had unskilled jobs or were unemployed, and over half of the mothers were housewives.

Table 2. Social and family characteristics of the respondents

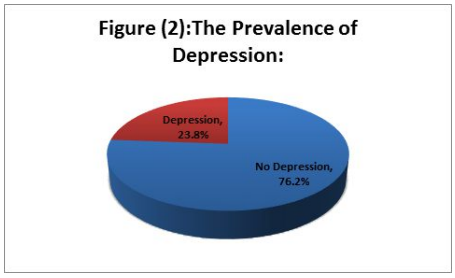
Social and family characteristics of the respondents	N = 500	%
Order among siblings		
Eldest	124	24.8
Middle	279	55.8
Youngest	97	19.4
Father's education level		
Below secondary	38	7.6
Secondary school	167	33.4
Bachelor's degree	118	23.6
Master's degree	73	14.6
Doctorate	48	9.6
Other	56	11.2
Father's occupation		
Teacher	19	3.8
Doctor	17	3.4
Engineer	78	15.6
Military	121	24.2
Banker	9	1.8
Unemployed	14	2.8
Other	242	48.4

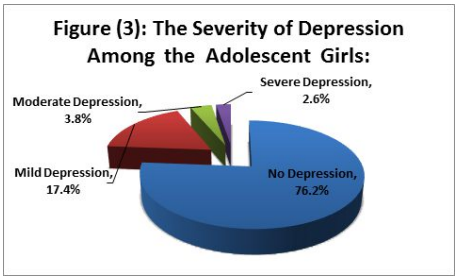
Mother's education level		
Under secondary	92	18.4
Secondary school	168	33.6
Bachelor's degree	145	29
Master's degree	36	7.2
Doctorate	11	2.2
Other	48	9.6
Mother's occupation		
Teacher	98	19.6
Doctor	14	2.8
Business	11	2.2
Banker	1	0.2
Housewife	284	56.8
Other	92	18.4
Number of people living in the household		
(2–5)	154	30.8
(6–9)	298	59.6
(10–13)	40	8
(14 or more)	8	1.6
People lived with		
Parents	459	91.8
Mother	24	4.8
Father	11	2.2
Relatives	1	0.2
Other	5	1
Type of accommodation		
Villa	308	61.6
Apartment	115	23
Single-floor flat	59	11.8
Other	18	3.6
Financial income		
< 4000 SR	20	4
Between 4000 SR to < 8000 SR	126	25.2
8000 SR–12000 SR	104	20.8
> 12000 SR	250	50

Next, Figure 1 shows that over 80% of the respondents had very good to excellent academic performance.



Figures 2 and 3 show that the prevalence of depression among the participants was 23.8%, of which 17.4% had mild depression, 3.8% had moderate depression, and 2.6% had severe depression.





The most important finding illustrated by Table 3 is that there is an insignificant relationship between the prevalence of depression and the social status of the participants, their nationality, type of school attended, age status among siblings, fathers' and mothers' education levels, fathers' and mothers' occupations, number of people living in their houses, who they live with, type of accommodation, and their families' financial income.

Table 3. The relationship between the respondents' socio-demogr aphic, social, and family characteristics and the prevalence of depression.

Socio-demographic, social, and family characteristics of the participants	No depression N = 381 (76.20%)	Depression N = 119 (23.80%)	P value
Age			
15	50 (10)	15 (3)	
16	129 (25.8)	31 (6.2)	0.004
17	151 (30.2)	39 (7.8)	
18	47 (9.4)	31 (6.2)	
19	4 (0.8)	3 (0.6)	
Social status			
Single	376 (75.2)	119 (23.8)	
Married	3 (0.6)	0 (0.00)	0.665
Divorced	1 (0.2)	0 (0.00)	
Widow	1 (0.2)	0 (0.00)	
Nationality			
Saudi	320(64)	101(20.2)	0.817
Non-Saudi	61 (12.2)	18 (3.6)	
Grade			
10	146 (29.2)	39 (7.8)	0.066
11	164 (32.8)	46 (9.2)	
12	71 (14.2)	34 (6.8)	
Type of school			
Private	129 (25.8)	41 (8.2)	0.905
Public	252 (50.4)	78 (15.6)	
Order among siblings			
Eldest	93 (18.6)	31 (6.2)	0.838
Middle	212 (42.4)	67 (13.4)	
Youngest	76 (15.2)	21 (4.2)	
Father's education level			
Under secondary	26 (5.2)	12 (2.4)	
Secondary school	126 (25.2)	41 (8.2)	
Bachelor's degree	89 (17.8)	29 (5.8)	0.782
Master's degree	59 (11.8)	14 (2.8)	
Doctorate	38 (7.6)	10 (2)	
Other	43 (8.6)	13 (2.6)	
Father's occupation			
Teacher	16 (3.2)	3 (0.6)	
Doctor	13 (2.6)	4 (0.8)	
Engineer	54 (10.8)	24 (4.8)	0.104
Military	86 (17.2)	35 (7)	
Banker	9 (1.8)	0 (0.00)	
Unemployed	9 (1.8)	5 (1)	
Other	194 (38.8)	48 (9.6)	
Mother's education level			
Under secondary	70 (14)	22 (4.4)	
Secondary	134 (26.8)	34 (6.8)	
Bachelor's degree	107 (21.4)	38 (7.6)	0.588
Master's degree	25 (5)	11 (2.2)	
Doctorate	7 (1.4)	4 (0.8)	
Other	38 (7.6)	10 (2)	
Mother's occupation			
Teacher	72 (14.4)	26 (5.2)	
Doctor	12 (2.4)	2 (0.4)	
Business	8 (1.6)	3 (0.6)	0.467
Banker	0 (0.00)	1 (0.2)	
Housewife	217(43.4)	67 (13.4)	
Other	72 (14.4)	20 (4)	
Number of people living in the household			
(2–5)	117 (23.4)	37 (7.4)	0.818
(6–9)	229 (45.8)	69 (13.8)	
(10–13)	30 (6)	10 (2)	
(14 or more)	5 (1)	3 (0.6)	

People lived with			
Parents	354 (70.8)	105 (21)	0.405
Mother	15 (3)	9 (1.8)	
Father	7 (1.4)	4 (0.8)	
Relatives	1 (0.2)	0 (0.00)	
Other	4 (0.8)	1 (0.2)	
Type of accommodation			
Villa	242 (48.4)	66 (13.2)	0.222
Apartment	84 (16.8)	31 (6.2)	
Single-floor flat	40 (8)	19 (3.8)	
Other	15 (3)	3 (0.6)	
Financial income			
< 4000 SR	14 (2.8)	6 (1.2)	0.588
Between 4000 SR and < 8000 SR	92 (18.4)	34 (6.8)	
8000 SR–12000 SR	83 (16.6)	21 (4.2)	
> 12000 SR	192 (38.4)	58 (11.6)	

Table 4 shows the existence of a significant relationship between depression and academic performance (p = 0.005).

Table 4. The association between academic performance and depression among the respondents

Academic performance	No depression N = 381 (76.20%)	Depression N = 119 (23.8%)	P value
Excellent (100–90)	213 (42.6)	45 (9)	0.005
Very good (89–80)	114 (22.8)	45 (9)	
Good (79–70)	49 (9.8)	25 (5)	
Fair (69–60)	4 (0.8)	4 (0.8)	
Repeater (< 60)	1 (0.2)	0 (0.00)	

As can be seen in Table 5, the Multidimensional Scale of Perceived Social Support (MSPSS), an instrument that measures social support received from family, friends, and significant persons, determined that the number of students who received low, moderate, and high levels of social support was 43 (8.6%), 150 (30%), and 307 (61.4%), respectively.

Table 5. Multidimensional Scale of Perceived Social Support scores for the respondents

Participants' Multidimensional Scale of Perceived Social Support scores	N = 500	%
Low support	43	8.6
Moderate support	150	30.0
High support	307	61.4

Next, Table 6 reveals the presence of a significant inverse relationship between the prevalence of depression and the level of social support provided.

Table 6. Respondents' Multidimensional Scale of Perceived Social Support scores and their effect on depression

Respondents' Multidimensional Scale of Perceived Social Support scores	No depression N = 381 (76.2%)	With depression N = 119 (23.8%)	P value
Low support	24 (4.8)	19 (3.8)	0.000
Moderate support	94 (18.8)	56 (11.2)	
High support	263 (52.6)	44 (8.8)	

Finally, Table 7 presents the results of a logistic regression analysis, which was performed to determine the relationship between depression and the significant variables. This table shows that there was a positive statistical relationship between age and depression (when age increases by one year, depression also increases), while a significant negative correlation existed between depression and academic performance (when performance decreases by one level, depression also increases). Also, a significant negative correlation was found between depression and MSPSS.

Table 7. Regression model for predicting depression using significant values

	β	SE	Wald	P	OR (95% CI)
Age groups	0.301	0.118	6.522	**0.011***	1.35 (1.07–1.70)
Academic performance	-0.154	0.061	6.299	**0.012***	0.857 (0.760–0.967)
Support	-0.889	0.159	31.229	**0.000***	0.411 (0.30–0.56)

5. Discussion

The current study aimed to measure the prevalence of depression and associated factors among adolescent girls attending schools in Al-Khobar City in the Kingdom of Saudi Arabia. Considering this goal, the primary result of this study is that the prevalence of depression in the analyzed sample was 23.8%. This is notable because it contrasts with the findings of previous related studies. For example, this percentage is much less than the prevalence of depression stated in Labban's (2016) and Raheel's (2015) studies, which reported 42.2% and 30%, respectively. However, the high percentages featured in these studies could be due to the different cut-off points used for the BDI II depression tool, as both previous studies used 19.

In contrast, the current study's findings concerning depression-prevalence are higher than the prevalence findings of 17.5% reported by both Wasfy et al. (2014) and Eskin et al. (2008). In this study, this discrepancy could be attributed to the use of a different scale for screening depression (CDI vs. BDI II).

In regard to the severity of depression among affected girls, in the current study mild depression was detected in almost three-quarters of the depressed respondents; this is similar to the findings of Abdel-Fattah and Asal (2006). However, the current study showed that less than a quarter of those with depression had severe depression while, in Labban's (2016) study, more than half of the depressed students had severe or very severe depression.

Next, a significant result was found in the current study in regard to older adolescent girls having greater depression than younger adolescents (p = 0.004). This significant relationship was also found in Labban's (2016) study, which reported a p value equal to 0.008, but no such significant relationship between age and the prevalence of depression was detected by Wasfy et al. (2014).

Further, the results of this study also show that adolescent girls in the 12th grade had a higher rate of depression, but this was not statistically significant (p = 0.066). In contrast, this difference was statistically significant (p = 0.003) in Labban's (2016) study while, interestingly, Raheel's (2015) study, which was also conducted in Riyadh, found no difference between the 10th and 12th grade and the prevalence of depression.

In our next finding, the prevalence of depression among public and private school students was found to be almost identical (p = 0.905); this is similar to the results of Raheel (2015). Meanwhile, in Wasfy et al. (2014), the prevalence of depression was greater in governmental schools than in private schools (26.2%, 15.3% respectively); further, this difference was statistically significant.

No differences were observed in this study in terms of the prevalence of depression between Saudi and non-Saudi students but, in contrast, Wasfy et al. (2014) reported that the prevalence of depression was higher in Emirian students than in expatriates (23.3% versus 15.5%); this difference was statistically significant (p < 0.05).

In regard to birth order, again this study showed that this did not have an effect on the prevalence of depression, but this contrasts with Abdel-Fattah and Asal (2006), who found that the prevalence of depression was lower in eldest and middle children, but increased in last-born children (p < 0.05).

Next, in relation to parents' education and occupation, we again found that this made no significant difference to the prevalence of depression among adolescents; however, in Wasfy et al. (2014), the prevalence of depression was found to be 23.5% in students for whom neither of their parents worked, and 13% for students for whom both of their parents worked; this difference was significant (p < 0.05)

Also, it should be noted that the results of Wasfy et al. (2014) showed that the educational level of both the father and mother affected the prevalence of depression through an inverse relationship (p < 0.05); similar results were found in the study performed in in Eskin et al. (2008).

The current study found that living with many people and having low household income increased the prevalence of depression, but this failed to reach statistical significance, with p values equaling 0.818 and 0.588, respectively. A similar result was obtained in Raheel's (2015)

study, where the prevalence of depression was found to be greater among adolescents with low household income. Additionally, both Raheel's study and that of Wasfy et al. (2014) showed the same results: that those who lived alone or with a single parent had a higher prevalence of depression; however, in the current study, the researcher found no such significant difference ($p = 0.405$).

In the current study, over 80% of the participants showed very good to excellent academic performance. The prevalence of depression was found to be inversely proportional to academic performance and was statistically significant ($p = 0.005$); this corresponds with the results found in Labban's (2016) study, where the prevalence of depression was 80% and 77.8% in satisfactory and poor students, respectively, while it was 25.3% among excellent students; this difference was statistically significant ($p < 0.001$).

The researcher used the Multidimensional Scale of Perceived Social Support to measure the social support that students received from their families, friends, and significant persons, and the result showed that 61.4% of students had high support while 8.6% and 30.0% had low and moderate support, respectively. The results also showed that the prevalence of depression was highest among girls with low support and lowest among girls with high perceived support ($p = 0.000$). Similar findings were obtained in Raheel's (2015) study, which found that the prevalence of depression was higher among students who did not perceive social support from their family and peers. Moreover, two different studies conducted in Turkey and USA measured perceived social support from both family and friends using the Perceived Social Support Scale, and both studies found an inverse statistically significant relationship between the prevalence of depression and social support (Eskin et al., 2008; Weber et al., 2010).

5.2 Limitations

This study is not without limitations. For example, only high school girls in a single city were targeted. This leaves a clear avenue through which further studies in this field can expand upon these results. In particular, future studies should include larger samples, adolescents from both sexes and who are from 10–19 years old, and assess more associated factors that can lead to depression.

5.3 Recommendations

- An annual screening for depression in particular and mental health in general for all students should be established in schools. Moreover, necessary actions should be taken to address high-risk groups, and these should receive special care and guides. Furthermore, health-education courses concerning adolescents' health should be organized in order to increase the level of awareness of all students, parents, and school members.
- There should be a regularly updated adolescent-care profile created for each adolescent student; this should be performed by both the school administration and the school health unit, in cooperation with heath care centers. Each profile should contain all medical information related to the student in question, such as a list of vaccines received, screening results, and details concerning every visit to as health professional, including illness history, physical examination records, and illness-management programs. Then, based on continuous reviews of such files, the school health doctor could evaluate each case, address any issues, recommend treatment, and perform follow-up examinations. This will ensure the continuity of care for adolescents and afford the early detection of warning signs of depression, allowing us to prevent or eliminate the factors that can lead to the development of this disease.

5.4 Conclusion

The current study demonstrated that depression is one of the most common mental disorders affecting adolescents and that there are associated factors that can affect the prevalence of depression among this population; some of these factors can be prevented if good, continuous, and correlated preventive and screening strategies are implemented in schools and primary health care facilities. This will help to achieve better mental health for school-going adolescent students. In particular, it can be concluded that older students with low academic performance and poor social support should be actively screened for the development of depression.

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