Types of depression and pattern of comorbidity among a sample of Egyptian Secondary school female students

Abdel Meguid M., MD, El Missiry M., MD, El Serafi D., MD, and Sabry W, MD

أنواع الاكتئاب ونمط المراضة المصاحبة لدى عينة من طالبات المدارس الثانوية المصرية

مروى عبدالمجيد، مروه المسيري، ضحى الصيرفي، ولاء صبري

Abstract

Background:Depression is one of the most prevalent disorders among female adolescents. It is associated with high rates of comorbidity and results in detrimental effects on social and academic functioning. **Objective:** The present study aimed to elucidate the types of depression and pattern of comorbidity in a representative sample of Egyptian secondary school female students. **Methods**: 602 female students, recruited from public and private schools in Eastern Cairo, were interviewed by a team of researchers using the Structural Clinical Interview for Diagnosis of DSM IV axis I diagnosis (SCID-I). **Results:** 5.2% fulfilled the diagnosis of major depression, 5% had minor depression in the form of adjustment disorder with depressed mood and only 3.1% had dysthymia. Students enrolled in third grade were more likely to have adjustment disorder, second grade students showed the highest rate of major depression, while first grade students had similar rates of major depression and adjustment disorder. Approximately two thirds of the students having depression had a co-morbid mental disorder. The most frequent comorbid diagnosis was generalized anxiety disorder (GAD) in 32.5% of depressed students followed by social anxiety disorder (20%) and substance abuse (9%). The pattern of comorbidity in relation to the school grades revealed significant statistical differences. **Conclusion**: Different types of depression were prevalent in a sample of Egyptian female students; depression in this age group was significantly associated with comorbid psychiatric disorders. The present study provides important information for clinicians, school authorities and policy makers interested in targeting services to such high risk group expected to be future citizens and mothers.

Key words: Depression – adolescents – females – comorbidity – types of depression
Declaration of interest: None

Introduction

Depression among adolescents in general and female adolescents in particular, has been identified as a major diagnosable mental health problem[1]. Life time prevalence increases dramatically from 1% of the population under age 12 to 17% of the population by the end of adolescence [2]. The understanding of why depression emerges with such force and frequency in adolescence, particularly in young women, was explained thoroughly by Andersen and Teicher [3].

Depression in youth has emerged recently as a compelling research topic because there is a two to four-fold risk of depression persisting into adulthood [4]. Young people suffering depression by the age of 15 may represent a high risk group for life-course persistence of depression and mal-adjustment [5]. In addition, early onset depression is of particular concern because it is associated with higher rates of recurrence and of comorbid disorders [5; 6]. Adolescents with depressive symptoms that meet diagnostic criteria for mood disorders have shown higher rates of adverse psychological and social functioning. Moreover, depression is associated with poor school performance, delinquency, running away, substance abuse, suicide and negative impacts on peer and family relationships[7]. Prospective research using community samples shows that more girls than boys exhibit depressive mood and symptoms [8]. Furthermore, Hankin et al. revealed that the sex difference in depression become most dramatic in middle to late adolescents [9]. More girls than boys become depressed owing to the strong influence of negative life events, especially those occurring in interpersonal contexts such as peer, romantic, and family relationships; girls have a tendency to react more strongly to these stressors in the form of depression [10]. Biological and social changes occurring during adolescence, especially in girls, also contribute to feelings of depression and lack of satisfaction [11; 12].

Major depressive disorder (MDD) is the most severe depressive mood disorder, with prevalence rates ranging from 10 – 18.5% in adolescence [13]. Longitudinal studies indicate that the mean MDD onset age is approximately 15 years [14]. In the National Comorbidity Survey, lifetime prevalence of minor depression was 8.1% for 15 to 16 year olds and 14.3% for 17 to 18 year olds [15, 16.] Slightly lower rates have been observed among Puerto Rican [17] and Finnish adolescents [16]. Minor depression is considered the strongest risk factor for future MDD [18]. While adjustment disorder with depressed mood is the most common depressive mood disorder in adolescents; the estimated cross sectional rate of dysthymia is only 3% [19].

When an adolescent meets the diagnostic criteria for one psychiatric disorder, it is likely that he or she will meet the criteria for at least one other disorder [20; 21].Some epidemiological data recorded a high comorbidity of conduct problems, attention deficit hyperactivity disorder (ADHD), substance abuse and antisocial behaviour with adolescents' depression [22, 23, 24].

Comorbidity of depression with other psychiatric disorders have also been associated with more severe symptom profiles, poor treatment outcome, increase in disability and service utilization [25].

Investigation of the pattern and correlates of comorbidity in depressed adolescents by Small et al. [21] revealed that psychological correlates differ meaningfully with

comorbidity, due to the more association with cognitive impairment, psychomotor changes and higher rate of suicidal ideation [26].Though depression remains a prevalent disorder associated with serious consequences, it is often under-diagnosed and under-treated in young people [27, 28].

To our best of knowledge, the study of the types of depression and patterns of comorbidity among Egyptian female adolescents received little attention. This study was designed to address this issue in order to provide preliminary information to clinicians, teachers and policy makers interested in providing services to adolescents' females who would be the future mothers.

Objective

The current study aims to elucidate the types of depression and pattern of comorbidity in a representative sample of Egyptian secondary school girls diagnosed with depression.

Subjects and Methods

Design of the Study

The current study is a cross sectional school-based study conducted during the academic year 2007-2008.

Site of the Study

The current study was conducted in Cairo, Egypt. A sample of female adolescent school students in Eastern Cairo was drawn. Recruited participants were secondary school girls aged 14-17 years. The sample frame was obtained from the Ministry of Education.

Ethical considerations

Ethical approval of the protocol of research was obtained by authority of Ain Shams University Postgraduate Affairs office and Ministry of Education authority before starting the study procedures. In addition, the students' parents were informed in advance by a letter to obtain their consents.The appropriate dates and time for assessment were established by the school principle. Students were informed about the nature of the research and confidentiality of the obtained information. It was stated that participation in the study was voluntary and that participants had the freedom to withdraw from the assessment at any time.

Selection

Basically a method of sampling was followed allowing each relevant factor to contribute in the constitution of the sample a share that was proportionate to its weight in the parent population. Determination of the size of this sample was done after the consultation of a statistician; sampling was performed randomly at five levels:

1- The city (Cairo) has five major geographical areas from which one was selected (Eastern Cairo).

2- Educational system in Eastern Cairo was divided into two major categories (Private and Public) based on socioeconomic profile. Six schools were selected from two educational districts, one district represent higher socio-economic status (three schools) and the other less affluent status (three schools).

3- From each school, 3 classes (one class represents each secondary grade: 1st, 2nd and 3rd grade) were selected and all students in each class were included. Selection of the classes was determined by the school authorities.

4- The identified potential participants were 676 girls. 18 guardians and 27 students declined to participate, and four students were excluded because of frequent medical sick leaves.

5- All students who gave their consents were examined by paediatricians to exclude those who have medical illness; 25 students were excluded because they had bronchial asthma, rheumatoid arthritis, renal problems, type I diabetes mellitus and other medical problems. (See Fig. 1: Flow chart). Finally 602 students were included in the study (mean age 15.5±0.87 year), including 292 from private schools and 310 from public schools. 229 students (mean age 14.83± 0.70 year) were in the first grade of secondary schools (equivalent to year 10) while 230 students (mean age15.44 ± 0.55 year) were in the second grade (equivalent to year 11), and 143(mean age 16.67± 0.62 year) were in the third grade (equivalent to year 12).

Tools applied in this study included

a) Children Depression Inventory (CDI) [29; 30] (Translated by Gharib Abdel Fatah, [31]. The measure is a reliable, valid self-rating scale) suitable for children and adolescents from seven to 17 years old [32, 33]. The cut-off point used for our study was 24, corresponding to that of a similar previous national study on Egyptian high school students 34.

b) Psychiatric interview by SCID-I/NP [35]**:** All participants were interviewed using the Structured Clinical Interview for DSM-IV axis I diagnosis Research Version, Non-patient Edition. (SCID-I/NP) [34]. The SCID-I/NP yielded a clinical diagnosis, which we further stratified into depressive and non-depressive. The depressive category was operationally defined as those having current episodes of Major Depressive Disorder, Dysthymic Disorder and Adjustment Disorders with Depressed mood.

c) Designed Questionnaire: We designed a set of questionnaires in the form of yes/no, multiple choice, or closed ended format based on Ain Shams Psychiatric Institute sheet to assess the following domains: age, place of residence, number of siblings, medical problems, positive and negative life events, scholastic achievement, puberty, family background, other personal data and extracurricular activities.

d) Academic achievement for each student during a two month period was estimated by school teachers and subsequently recorded by researchers.

Procedures

602 adolescent female students were first asked to complete the Child Depression Inventory (CDI) and the designed questionnaire. They were then interviewed by the Clinical Interview for DSM-IV Axis I diagnosis; 80

students received a diagnosis of major depression, dysthymia or adjustment disorder with depressed mood according to DSM IV Axis I diagnosis.

Senior psychiatrists re-examined the 80 students for a comorbid axis I diagnosis. The examination revealed that

30 students had no comorbid disorders while 50 students had a second or more diagnoses in addition to the principle diagnosis on Axis I. Fig. 1

Figure 1. Flow Chart

Total Number 676 Students

602 Students Included		74 Students Excluded			
292 Students Private	310 Students Public Schools	18 Students Guardian Refusal	27 Students Refusal	4 Students Frequents Leaves	25 Students Medical Causes

Data processing and statistical analysis

Analysis was done using Statistical Package for Social Science Version-10 (SPSS v.10). Differences of group means were statistically tested using Students' *t*-tests and ANOVA. The Pearson Chi square test (x2) was used to examine group differences in nonparametric data. P value was used to indicate the level of significance (P≤0.05 is considered significant, P≤0.01 is highly significant, P≤0.001 is very highly significant).

Results

Using the Structured Clinical Interview for DSM IV diagnosis (SCID-I) we found that 80 out of 602 students (13.3%) had depression. 5.2% (n=31) of the entire students population had major depression, while 5% (n=30) had adjustment disorder with depressive mood and 3.1% (n=19) had dysthymia (Fig. 2).

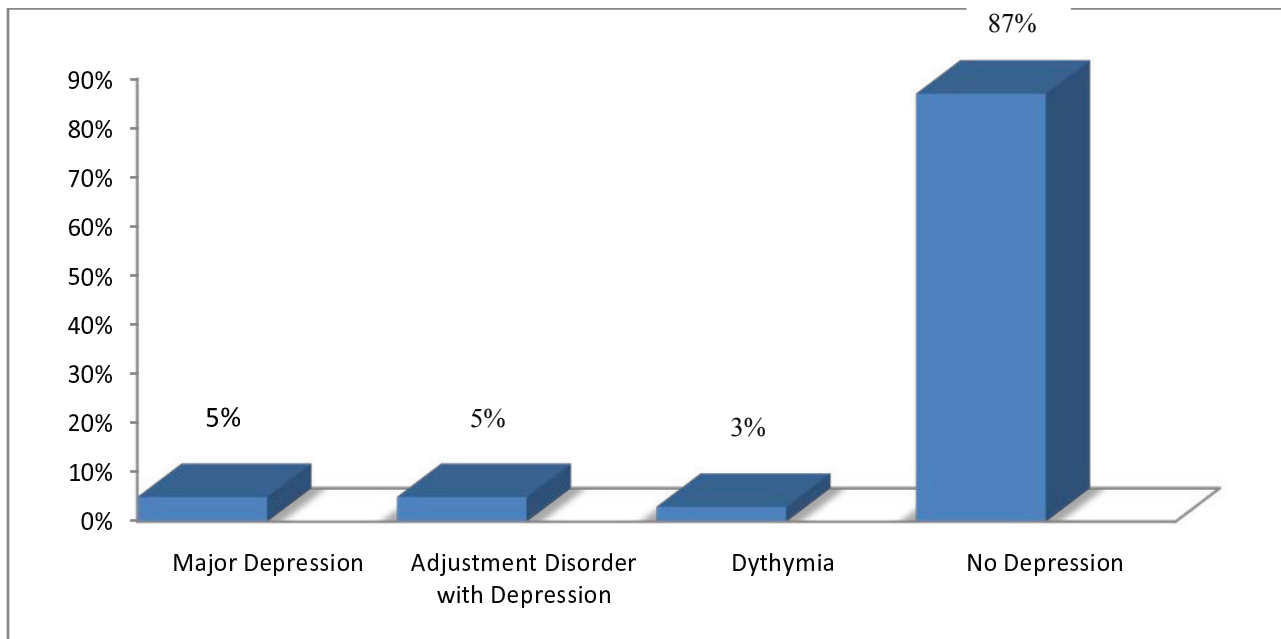**Figure2. Types of Depression among the total student population**

Figure (3) illustrates the rate of depression in students enrolled in the second grade of study (equivalent to year 11) was the highest (18.3%) compared to the rate estimated in students enrolled in the first grade (equivalent to year 10) and third grade (equivalent to year 12) (10% and 9.8% respectively).

Figure 3.Rates of depression according to the school grade
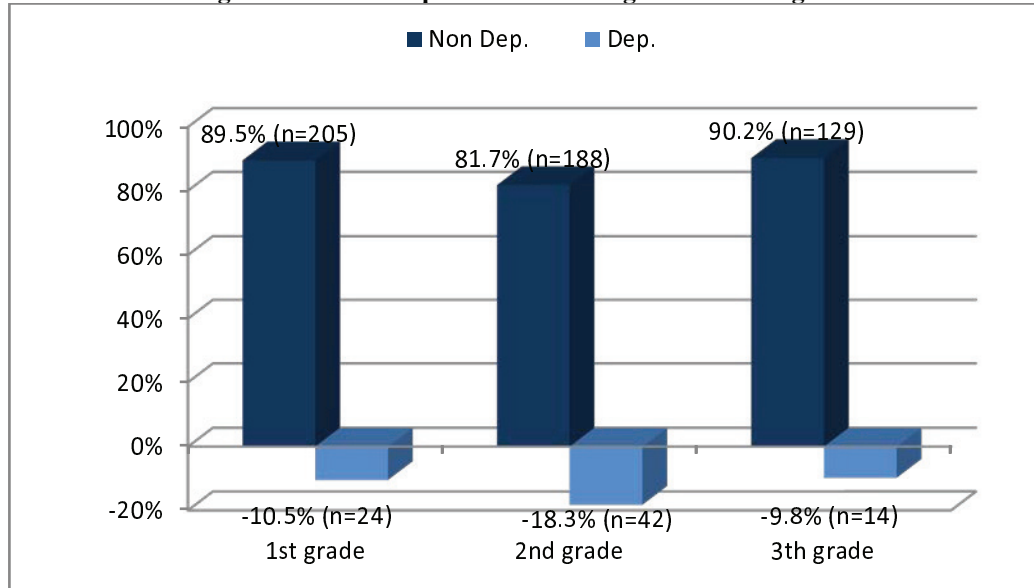
In (table 1a) we presented the types of depression among depressed participants, 38.75% had major depression, 37.5% had minor depression in the form of adjustment disorder with depressed mood, while only 23.75% had dysthymia.

The type of depression differs markedly in relation to the school grade, we found that third grade depressed students were more likely to have adjustment disorder with depressed mood 57% while second grade students suffered more frequently from major depression 38.1%; however, in first grade students we found similar rates of major depression and adjustment disorder 41.7% each.

In an attempt to elucidate the difference in the types of depression according to whether the students belonged to private or public schools, results failed to show any statistical significant difference between them (table 1c).Table (2a) illustrates that 37.5% of students with depression had only one diagnosis on Axis I, while the rest (62.5%) showed another diagnoses with the principle one. Generalized anxiety disorder (GAD) was by far the most encountered comorbid diagnosis (n=26; 32.5%). followed by social anxiety in 20%while about (9%) had substance abuse.

Table 1.Type of depression among students with depression

Type of depression	1a	1b			1c	
	Total	According to school grades			According to type of school	
	n=80	1st Grade n=24	2nd Grade n=42	3rd Grade n=14	Private school n=39	Public school n=41
Adjustment disorder	30 (37.5%)	10 (41.7%)	12 (28.6%)	8 (57%)	13 (36%)	17 (41%)
Major depression	31 (38.75%)	10 (41.7%)	16 (38.1%)	5 (36%)	18 (46%)	13 (32%)
Dysthymia	19 (23.75%)	4 (16.6%)	14 (33.3%)	1 (7%)	8 (18%)	11 (27%)
		x2= 6.83 / df=2 / p=0.019 (sig)			x2= 0.18 / df=2 / p=0.67 (insig)	

The pattern of comorbidity in relation to the school grades (table 2b) revealed significant statistical differences (p=0.018). Among 2nd grade students with depression, the highest rate of comorbid diagnosis was

generalized anxiety disorder (50%). First grade students with depression were more likely to have comorbid social anxiety disorders (38%). Our data indicate that the most frequent comorbid diagnosis with depression among third grade students was substance use disorder (29%).

Rates of comorbidity with depression did not show any statistical significant differences when we compared students with depression enrolled in private versus public secondary schools (table 2c).

Table 2.Comorbidity among students with depression

	2a	2b			2c	
	Total	According to school grades			According to type of school	
	n=80	1st Grade n=24	2nd Grade n=42	3rd Grade n=14	Private school n=39	Public school n=41
No comorbidity	30 (37.5%)	11 (46.1%)	13 (31%)	6 (43%)	12 (30.7%)	18 (44%)
GAD[1]	26 (32. 5%)	2 (8%)	21 (50%)	3 (21%)	10 (26%)	16 (39%)
Social anxiety	16 (20%)	9 (38%)	6 (14%)	1 (7%)	11 (28%)	5 (12%)
OCD[2]	1 (1.25%)	1 (4%)	0 (0%)	0 (0%)	1 (2.5%)	0 (0%)
Substance abuse	7 (8.75%)	1 (4%)	2 (5%)	4 (29%)	5 (12.8%)	2 (5%)
		$x2= 18.45 / df=8 / p=0.018$ (sig)			$x2= 5.69 / df=4 / p=0.22$ (NS)	

1: Generalised Anxiety Disorder   2: Obsessive compulsive Disorder

We could not elicit any association between comorbidity and any of the following variables: mean age, pubertal age, academic achievement, family history of psychiatric

illness, home environment, and negative life events (table 3).

Table 3.Correlates of Comorbidity

		No comorbidity =30	Comorbidity =50		95%Confidence interval
Age	naem±SD	15.4±0.9	15.49±0.93	t 0.01 p= 0.99	-0.393- 0.39
Pubertal Age	naem±SD	12.4±0.8	12.21±1.32	t 1.09 p= 0.28	-0.229- 0.784
Academic Achievement	naem±SD	78.9±9.4	76.92±11.23	t 0.65 – p= 0.52	-6.191 – 3.145
Family History of Psychiatric Illness	evitisop	n=4 13%	n=7 14%	x2 0.81 – df 1 p= 0.99	
	evitagen	n=26 87%	n=43 86%		
Home Environment	suoinomrah	n=9 30%	n=17 34%	x2 0.24 – df 1 p= 0.624	
	moslerrauq e	n=21 70%	n=33 66%		
Negative life events	tneserp	n=6 20%	n=11 22%	x2 0.013 – df 1 p= 0.911	
	tnesba	n=24 80%	n=39 78%		
Termination of Romantic Relation	evitisop	n=10 33%	n=15 30%	x2 0.93 – df 1 p=0.33	
	evitagen	n=20 67%	n=35 70%		

Discussion

Adolescent depression is an increasingly problematic diagnosis for young people and is associated with more chronic, severe episode and higher rates of comorbidity [36, 37].

The purpose of this study was to investigate type of depression and pattern of comorbidity in a sample of adolescent girls enrolled in secondary schools in Eastern Cairo, Egypt.

5.2% of the studied population met the criteria for major depression. This data supported the results reached by Shaffer and colleagues [14] who found that the prevalence of major depressive symptoms reached 5% among children and adolescents between 9 and 17 years of age of both sexes. A higher rate was recorded by Rhode and co-workers who estimated that one-year prevalence at age 16 was 15.3% [38]. Among Nigerian female adolescents, Adewuyaand co-workers[28] identified an 8.9% prevalence rate of major depression. On the other hand, in a community sample the rates of clinically

defined major depressed ranged from 0.4 to 8.3% or higher [39, 40]. This variability in results may be explained by differences in the sampling process and tools used for assessment [41,42]. A good proportion of adolescents exhibit depressive symptoms that are sub-threshold for the diagnosis of major depression [11, 43], such as Adjustment Disorder (AD) with depressed mood which involves experiencing fewer symptoms than fulfilling the criteria for major depression. In our study, Adjustment Disorder with depressed mood was the second most commonly encountered depressive disorder among the student population (5%). Most of the clinical symptoms typically started within three months of an identifiable stressor. Similarly, Pelkonen and co-workers found that adjustment disorder was the second most common clinical entity among a sample of Finnish adolescent outpatients [44]. Some authors considered Adjustment Disorder a major precursor and predictor of major depression and other mental disorders, personality problems, behavioural and conduct problems, delinquency, substance misuse and suicide [38;45;46;47;48; 49; 50]. We could not elicit such association by the cross sectional design of our study

Dysthymia is a chronic milder form of depression characterized by depressed or irritable mood present for at least one year [4]. Some argue that these symptoms represent typical adolescent moodiness and turmoil but there is also evidence that these symptoms represent risk for future substantial impairment [51]. The rate of dysthymia among adolescents in the current study was found to be 3.1%. This is consistent with western studies where the rate of dysthymia ranged between 3% and 3.5% [52].

Minor depression should be considered as a risk factor to developing major depression according to Kovacs and coworkers who found that 70% of adolescents with dysthymic disorder eventually developed major depression [53]. Such association should be considered in future longitudinal studies. Different studies in different cultures found that depressive symptoms were significantly linked with scholastic grades [54, 55]. Similarly, in our society the highest rates of depression were found among students enrolled in second grade followed by other grades. This could be explained by the stress imposed on those students due to the new educational system in Egypt and the increasing difficulties of the university entry system which impose significant pressure on students to obtain high scores at the end of secondary school in order that they might join university. The preparation of the final exam starts from the second year. All families from different social strata spend a lot of money to finance extracurricular private lessons for better achievement of their youth. This pressure imposed on students aggravates those at a higher risk to develop depression. Similar difficulties also were observed in Greek society [12;55].

Patterns of Co-Morbidity

DSM criteria for diagnosis of depression are similar to those for adults. If there is any comorbid disorder with depression, it requires the presence of depression beforehand. High comorbidity with depression in adolescents has been reported in several studies. Angold and Costello recorded that approximately two thirds of children and adolescents with major depressive disorder were found to have another mental disorder [56] while Small and his colleagues found that more than half of their depressed sample had comorbidity with one or more disorders [21]. In the National Co-morbidity survey, 76.6% of adolescent with major depression and 69.3% of those with dysthymia presented at least one other psychiatric disorder [57].

Several researchers have documented that the most common comorbid disorder with depression is anxiety disorder. Generalized anxiety disorder (GAD), in particular, is recorded to be the highest comorbid condition with adolescent depression [21, 52]. Other disorders include ADHD, oppositional defiant, conduct, antisocial behaviour and substance disorder [4;58].

In concordance with the previous studies, 62.5% of our depressed sample had at least one comorbid diagnosis on Axis I. Generalized anxiety disorder (GAD) was found to be the most prevalent co-morbid diagnosis with depression (32.5%); it was noticed also that the rate was strikingly higher in the 2nd grade students probably due to increase academic pressure owing to the new educational system in Egypt which impose much stress on the second year of high schools. Moreover, comorbid anxiety disorders were noticed to be higher in public schools more than private schools; this could be attributed to the school structure, crowding in the classroom and educational approach, which is more integrated in private than in governmental schools [59].

Adolescents with a diagnosis of a depressive disorder are more impaired in their social functioning than non-depressed adolescents; also depressive symptoms are associated with interference in various domain of peer relationship [60, 60, 62]. This data could explain why social anxiety disorder was recorded to be relatively highly comorbid with depression in our study, especially in the first grade students who moved to new schools and new environments.

The issue of substance abuse is complicated from a cultural prospective as there are differences between our culture and that of western countries. These were reflected in the under-reporting of substance abuse in general and especially in females due to fear of social stigma in comparison to higher prevalence rates reported by Martin and Cohen [63] in western Countries.

Gender relates to the temporality of depression and substance disorders. Depression has been suggested to be primary to substance dependence among girls and secondary to it among boys [23, 64]. Thus, depressed female students were more likely to have comorbid substance abuse.

Possible reasons to explain comorbidities with depression at such high rates may be related to a common genetic liabilities shared by the two disorders. It has been suggested that the comorbid disorder may be an

alternate manifestation of the same latent factor, which manifests as depression [65], or it may constitute a heterogeneous phenomenon of clinically meaningful classes including somatic and psychological depression and somatic and psychological anxiety [66].

Our study failed to prove that a number of variables such as age, pubertal age, academic achievement, family history and exposure to stressful events have any correlation with comorbidity. However, previous findings have shown that positive family history, socio-demographic variables and educational attainment influence comorbidity in depressed adolescents [21,67, 68, 69]. Such results could be related to the relatively small sample size.

Given the long-term morbidity of early onset depression, it is timely to consider more effort to the prevention of primary and secondary depression [70, 71]. Understanding depression in this population and appropriate intervention will reduce the negative health outcome in youth.

Conclusion and Recommendations

Depressive disorders were highly prevalent in a sample of Egyptian female students. Our results on the type of depression and pattern of comorbidity add meaningfully to the previous literature. Major depression was highly prevalent, also the rate of minor, depression and Adjustment Disorder. Results documented that depression in this age group was significantly associated with comorbid psychiatric disorders. Generalized anxiety disorder was by far the highest comorbid disorder followed by social anxiety and substance abuse in the current sample.

The current study offers implication and adds insights into depression in female adolescents and may be informative for clinicians, teachers, parents and also policy makers who are interested in targeting services to such high risk group by designing programs for prevention and early intervention. We encourage further research to fully explore all risk factors that could be correlated with comorbidity in depression and to examine the mechanism of its' occurrence in future.

Strength and Limitation

The strength of the current study lies in the fact that it is one of the few studies to have investigated depression in Egyptian female adolescents. Moreover, all recruited students were interviewed by trained psychiatrists using a structured psychiatric interview. The findings from this study have also several practical implications.

However, the current study was not without limitation. We had assessed adolescents' depression in a single school community with relatively small sample size and used a sample of students that represented a range of urban populations. Thus, the findings cannot be easily generalized to other populations. Also, we emphasised the on-going episode and not the life time symptoms of depression. We could not establish a causal link between depression and comorbid disorders because of the cross-sectional design of the study.

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الملخص

يُعد الاكتئاب من أكثر الاضطرابات انتشاراً بين المراهقات ، ويرتبط بمعدلات مرضية مصاحبه عالية كما ينتج عنه آثار تضر بالأداء الأكاديمي والاجتماعي . **والهدف من هذه الدراسة** هو إيضاح أنواع الاكتئاب ونمط المرضية المصاحبة في عينة ممثلة من طالبات المدارس الثانوية المصرية. **طرق البحث:** تم إجراء مقابلة بواسطة فريق عمل من الباحثين مع 602 طالبة ، من مدارس ثانوية حكومية وخاصة في منطقة شرق القاهرة باستخدام المقابلة الإكلينيكية المعيارية للتشخيص على المحور الأول حسب الدليل الإحصائي الأمريكي الرابع لتشخيص الأمراض النفسية **نتائج البحث :** تبين من نتيجة البحث إصابة 5.2 % بالاكتئاب الجسيم ، و 5 % بالاضطراب التكيفى مع مزاج اكتئابي وكان فقط 3.1 % لديهم مرض عسر المزاج. وبدا واضحاً انتشار اضطراب التكيف في طالبات الصف الثالث الثانوي أما طالبات الصف الثاني ثانوي فقد اظهرن أعلى معدلات الاكتئاب الجسيم ، بينما سجل طالبات الصف الأول الثانوي معدلات متساوية من الإصابة بالاكتئاب الجسيم واضطراب التكيف. وقد أوضحت الدراسة إصابة ما يقرب من ثلثي الطالبات اللاتي يعانين من الاكتئاب باضطرابات مرضية مصاحبة وكان من أكثر التشخيصات شيوعا بين الطالبات هو اضطراب القلق العام في 32.5% من الحالات يليها القلق الاجتماعي بنسبة 20% والتعاطي والإدمان بنسبة 9% . وكشف نمط المرضية النفسية المصاحبة فيما يتعلق بالصفوف المدرسية فروق ذات دلالة إحصائية ، حيث كان مرض الخوف الاجتماعي مصاحبا للاكتئاب بين طالبات الصف الأول ثانوي واضطراب القلق العام بين طالبات الصف الثاني ثانوي أما التعاطي والإدمان فقد انتشر مصاحبا للاكتئاب بين طالبات الصف الثالث ثانوي. **الخلاصة:** تنتشر أنواع مختلفة من الاكتئاب في عينة من الطالبات المصريات بالمدارس الثانوية كما أرتبط الاكتئاب عندهن ارتباطا وثيقا بوجود اضطرابات نفسية مرضية مصاحبة في هذه الفئة العمرية وتقدم هذه الدراسة معلومات هامة للأطباء وأصحاب القرار في السياسات الصحية والسلطات بالمدارس والمهتمين بالخدمات المقدمة لهذه المجموعات عالية المخاطر والمتوقع أن يصبحن أمهات المستقبل.

Corresponding Author
MarwaAbd El Meguid, MD
Lecturer in Psychiatry, Institute of Psychiatry,
melmeguid@gmail.com
Authors
MarwaAbd El Meguid,
Marwa El Missiry,
Doha El Serafi,
Walaa Sabry,
Lecturer in Psychiatry, Institute of Psychiatry, Ain Shams University.