

Risk Factors for Depression Among Adolescents in Secondary Schools in Kakamega County, Kenya

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To cite this article:

Grace Buluma Bakesia, Olayo Nereah Rose, Gladys Jepkorir Mengich, Rose Atieno Opiyo. Risk Factors for Depression Among Adolescents in Secondary Schools in Kakamega County, Kenya. *American Journal of Applied Psychology*. Vol. 12, No. 4, 2023, pp. 96-102.

doi: 10.11648/j.ajap.20231204.13

Received: July 12, 2023; **Accepted:** July 31, 2023; **Published:** August 15, 2023

Abstract: Background: Depression is the third leading public health concern and second leading cause of death for adolescents. Risk factors for depression varies among adults, youth and children. This paper specifically identified the risk factors for depression among adolescents. An analytical methodology was adopted. Quantitative methods of data collection were used. An Adolescent Sociodemographic questionnaire was used for data collection. Statistical Package for Social Sciences Version 27 was used for analysis. The risk factors were grouped as psychosocial, biomedical, and school-related. Findings showed that the significant risk factor for depression among adolescents were age, level of study, school category, being orphaned, parental marital status, and socio-economic status of parents. The significant biomedical factors were having HIV, anxiety and alcoholism, while the school-related predictors were difficulty in concentrating in school and difficulties with the school rules and regulations. Depression among adolescents may be predicted by a myriad of factors. The study recommends frequent screening of depression among adolescents with comorbidities for detection and action. Social support programs may target orphans, adolescents from lower social classes and those from single parents. Students and school social support groups may be trained on social support for each other.

Keywords: Adolescents, Depression, Risk Factors, Secondary Schools

1. Introduction

Depression is a disease that affects how an individual feels, thinks and acts [1]. While it is viewed and thought of as just a feeling of sadness, depression is a real medical condition presenting with particular symptoms. It modifies the manner in which people envisage themselves [2]. While it was perceived as a disease of adults, child psychiatric epidemiological studies affirm that children and adolescents experience depression [3]. Studies have further indicated that the start of depression peaks in adolescence [4]. Risk factors are never static and depend on an individual [5]. Literature reveals several risk factors that are discussed herein but a focus on adolescent population is scarce. Research reports a high prevalence of depression among adolescents in schools in

Kenya [6, 7]. Depression if not addressed, greatly affects school attendance and performance. It as well as causes social withdrawal which exacerbates loneliness [8]. In its severe form, depression may result in to comorbidity, suicide, and increased drug and substance abuse [1]. There is need to establish the risks for this disease that is increasingly affecting the adolescents.

Biological factors may predict depression. Previous research for instance shows that when the Hypothalamus, the Pituitary gland and the Adrenaline gland axis (HPA) are overactive, it may lead to much secretion of the adrenal hormone. The hormone is implicated in the fight, flight, or freeze effect, as well as the release of cortisol which is the stress hormone of the body. The stress may lead to all manner of health challenges such as depression [9]. Additionally, anomalies in serotonin genetic transmission are often

associated to depression. The *s/s* genotype is connected to a reduction of serotonin expression, that is associated with greater vulnerability to depression [10].

Sex is another predictor for depression. Findings of a study reveal that females undergo major depression approximately twice as often as males [11]. It has also been shown that depression is at its peak during the female's reproductive years. This is as a result of an influx of hormones related to their menstruation, pregnancy and childbirth which contribute to depression [11]. Pubertal hormones are also linked to adolescent depression. Moreover, girls are twice as likely to undergo depression as boys. Use of certain birth control pills and Acutane for treating acne is linked to adolescent depression, among females [12].

Having disease may also be risk factor for depression. In Western Kenya, a study done by Larsen *et al.*, among adolescent girls and young women show relations between depression and HIV/AIDS [13]. The findings of depression levels were determined by the Center for Epidemiological Studies Depression Scale (CESD-10) score ≥ 10 . The results established that thirty four percent of participants had moderate to severe depression and showed an increased HIV risk mark comparable to 5 to 15 incident HIV cases per 100 person-years [13]. Another study by Kanner *et al.*, measured the association between young person's suffering from depression and diabetes on glycemic control, quality of life, among other factors. The study concluded that juveniles with type 1 Diabetes have importantly higher levels of depression more than the broad population [14].

Genetics has also been identified as a predictor for depression. A study done by Garber J, reveals that parental depression as a significant predictor for depression in young people [15]. A comparison of non-depressed parents, children of depressed parents were close to three to four times probable of having depression. The children of depressed parents were also found to have an increased risk medical use, other mood disorders, negative behaviour, school related challenges, suicide trials, substance abuse and among others [15]. Cognitive explanations of depression also maintain that when individuals with negative self-perceptions are confronted with stressful life events, they will evaluate the stressors and their effects in a negative way, and thus are more apt to be depressed unlike persons who have positive cognitive styles [11].

Researchers have linked drug abuse to depression. A study done by Njoku *et al.*, among secondary schools in Nigeria to establish the relationship between depression and drug confirms that drug use increases depression [16]. Family dysfunctions have also been reported as risk factors for depression. A study by Ndeti *et al.*, in Nairobi Kenya among adolescents in schools shows that family dysfunctions are a great source of psychiatric disorders in children [17]. In dysfunctional families, he notes that there is a high prevalence of parent-to-parent or parent-to-child conflicts that increases the risk of adolescence developing psychiatric disorders. The study further shows that the uninvolved parenting behavior is associated with child negligence, both physically and

emotionally [17]. Studies have also revealed that parenting modes pose a risk factor for depression. Authoritarian as well as the uninvolved mothers may emotionally and physically abuse their children leading to depression [17].

Studies have further shown that childhood stress and trauma increases the child's risk of developing both substance disorder and depression later in life. Additionally, early childhood exposure to stress such as child abuse and neglect compounds the risk for depression and other disorders when they attain adulthood [18]. A recent study by Huang *et al.*, among 1871 college students in China supports that adverse childhood experiences lead to low PWB which is a trigger of depression. Losing a parent has always left individuals feeling low, sad and even withdrawn. The commonest response in children to orphan-hood is depression that is characterized by, hopelessness, anxiety, as well as the fear of being alone [19].

A study done among orphans found out that orphaned children are more depressed, much anxious, and hopeless about the upcoming life [20]. Such depressed orphans were likely to exhibit anger feelings and have much turbulent characters compared to children with parents [21]. A study conducted by Naveed *et al.*, on the association of bullying and depressive symptoms reveals a positive relationship. In the study of 452 participants, a multiple regression analysis showed that depression scores were higher among the perpetrators and victims of bullying. Bullying victimization was a stronger predictor of depressive symptomology [22]. These studies highlighted have less been studied within school environments. The current study focused on the psychosocial, biomedical and school related risk factors for depression among adolescents in schools.

2. Materials and Methods

The study was conducted in secondary schools of Kakamega County which is located in the Western part of Kenya. An analytical design was adopted. Mixed methods of data collection were used. Multi-stage cluster sampling was used to select schools. From the clusters, 45 schools were then randomly selected. For the sample size for the adolescents, a G-power analysis was used to ascertain the sample size (*n*), computed as a function of the required power level ($1-\beta$) which was taken as 80%, the pre-specified significance level ($\alpha=0.05$), and a population effect size of 0.4 (23). Based on this analysis, the study recruited 448 adolescents of 15-19 years, through simple random sampling. Kutcher adolescent depression scale-11 items was used to screen for depression. Those who scored above the mean were 184 adolescents who formed the sample. An adolescent sociodemographic questionnaire and key informant guides were further used for data collection. These tools were formulated from the literature review and were used to determine the risk factors for depression among the adolescents. Validity was ensured through a pilot study conducted in the nearby County. The pilot study was used to assess the clarity of the wordings in the data collections tools. Written assent was also an inclusion criterion for the adolescents below 18 and consent from

guardians. Adolescents above 18 consented for themselves in written.

Table 1. Study Population and Sample size.

Respondents	Sample population	Sampling method
Schools	45	Multi-stage cluster
Adolescents before screening	448	Simple random
Depressed adolescents	184	Purposive
Sub County Education Directors	12	Purposive
Sub-County Medical Officers	12	Purposive

3. Statistical Analysis

Statistical Package for Social Sciences (SPSS) version 27 was used for analysis. Odds ratios were computed to determine the predictors depression. Frequency tables and percentages were used to display the risk factors and verbatim quotes were for the findings of the qualitative data.

4. Results

The researcher conducted a generalized linear model analysis

for the socio-demographic characteristics and all the risk factors for depression. The findings showed that adolescents who were under 17 years were 1.7 times (OR: 1.72, 95% CI: 1.16, 2.54), more likely to develop depression compared to students above 17 years. Likewise for form 1 and 2 students were nearly 2 times more likely to have depression as compared to participants in form 3 (OR = 1.83, 95% CI: 1.23, 2.71). Findings further show that adolescents in schools that were run by a sponsor were 1.3 times (0.74, 2.23) less likely to suffer from depression, while adolescents in boys boarding schools were 1.9 (1.276, 2.781) times likely by to be depressed than those in girl schools. Findings are as shown in table 2.

Table 2. Socio-demographic Characteristics as Predictors of Depression.

Variable	Depressed (n=184)	Odds Ratio (95% CI)	p-value
Age in years			
≤17	60.9	1.72 (1.16, 2.54)	0.021**
> 17	39.1		
Gender			
Male	46.7	0.79 (0.42, 5.22)	0.52
Female	53.3	Ref	Ref
Form (Class)			
Form 1 and 2	60.9	1.83 (1.23, 2.71)	0.05**
Form 3	38.1	Ref	Ref
School Category			
Government	100	0.5 (0.0801, 1.137,)	0.601
Private	0	Ref	
School run a Sponsor			
No	91.8	1.3 (0.74, 2.23)	0.035**
Yes	8.2	Ref	Ref
School type			
Boys' boarding/ boarding and day	15.3	1.9 (1.276, 2.781)	0.550*
Girls' boarding/girls' day and boarding	15.8	0.4 (0.068, 1.911)	0.354
Mixed Day	69.3	Ref	Ref
Religion			
Christian	95.1	1.138 (2)	0.566
Muslim	4.9	Ref	Ref
Residence			
Urban	20.7	0.21 (2)	0.897
Peri-urban	11.9	0.25 (0.076, 1.811)	0.786
Rural	67.4	Ref	Ref

4.1. Psycho-Social Risk Factors for Depression Among Adolescents

The results show that the risk of developing depression was three times, 1.5 times and 1.2 times for students who had no parents (OR=3.06, 95% CI: 1.03, 9.04), those who had a single-parent mother only (OR= 1.52, 95% CI: 0.76, 2.80) and father only (OR= 1.21, 95% CI: 0.21, 2.31) respectively compared to students who had both parents. Students who were neutral on whether they had ease talking to their parents and

those who had difficulty in talking with their parents were twice (OR: 2.06, 95% CI: 0.103, 5.04) more likely and 17% (OR= 0.83, 95% CI: 0.39, 1.75) less chance of developing depression than those who had it very difficult to talk with their parents.

On the other hand, adolescents whose parents never married also had nearly three times (OR=2.7, 95% CI: 1.62, 4.24) likelihood of developing depression than those whose parents were married. Students whose parents were perceived to be poor on the other hand were 3.3 times (OR= 3.3, 95% CI: 1.66, 5.31) significantly more likely to develop depression than

those whose parents were perceived to be rich. Other factors that had significant influence on depression were: having relationship problems (OR= 2.1, 95% CI: (1.42, 3.79); being anxious (OR= 1.83, 95% CI: 1.23, 2.71). The findings are shown as in table 3. Conspicuously, there was also increased likelihood of students who had access to internet developing depression (OR=1.4= 95%; 95% CI; 1.01, 2.18) than those who did not.

Table 3. Psycho-Social Risk Factors as Predictors of Depression.

Variable	O.R (95%CI)	P-value
Have parents		
None	3.06 (1.03, 9.04)	<0.001**
Father only	1.52 (0.76, 2.80)	0.02**
Mother Only	1.21 (0.21, 2.31)	0.01**
Both	Ref	
Staying the same household with parents		
Yes	0.56 (0.13, 2.45)	0.44
No	Ref	
Ease of talking to parents about important things		
Very easy	1.12 (0.31, 5.02)	0.28
Neutral	2.06 (1.03, 5.04)	0.02**
Difficult	0.83 (0.39, 1.75)	0.05**
Very difficult	Ref	
Parental marital status		
Single	0.38 (0.03, 4.22)	0.43
Never Married	2.70 (1.62, 4.24)	<0.001**
Separated	1.41 (0.33, 6.12)	0.64
Married	Ref	
Perceived parental Socio-economic status		
Poor	3.32 (1.66, 5.31)	0.03**
Middle	1.89 (1.16, 7.07)	0.11
Rich	Ref	
Having siblings		
Yes	3.13 (0.51, 19.33)	0.22
No	Ref	
Relationship problems		
Yes	2.1 (1.42, 3.79))	0.055*
No	Ref	
Having Anxiety		
Yes	1.83 (1.23, 2.71)	<0.001**
No	Ref	
Separation from partner last 12 months		
Yes	3.29 (0.59, 18.37)	0.06
No	Ref	
Have access to internet		
Yes	1.4 (1.01, 2.18)	0.05**
No	Ref	

4.2. Biomedical Risk Factors of Depression Among Adolescents

An analysis was conducted using the generalized linear regression model analysis. The results show that alcoholism, HIV positive or infection, and anxiety, significant predictors of depression among students. Adolescents who took alcohol had 63% (OR=0.63; 95% CI: 0.03, 1.33) chance of suffering from depression compared to those who did not. Adolescents who were HIV positive had 1.75 times (OR=1.75; 95% CI: 1.06-2.56) higher risk for depression than those who were HIV negative. On the other hand, adolescents who were anxious had 90% (OR=95% CI: 0.07-4.88), chance of suffering from depression than those who were not (Table 4.6). However, heart disease, Diabetes Type 1&2, kidney disease,

Respiratory disease, Suicide attempt, bipolar disorder, and Cancer were not predictors of depression. Results are as shown in table 4.

Table 4. Biomedical Risk Factors for Depression among Adolescents.

Variable	O. R (95% CI)	P-value
Heart Disease		
Yes	0.41 (0.08, 2.33)	0.31
No	Ref	
Alcoholism		
Yes	6.29 (1.63, 24.33)	<0.001**
No	Ref	
Diabetes Type 1		
Yes	0.03 (0.06, 6.07)	0.90
No	Ref	
Diabetes Type 2		
Yes	0.09 (0.00, 5.93)	0.500
No	Ref	
Kidney disease		
Yes	0.67 (0.03, 2.54)	0.24
No	Ref	
HIV positive		
Yes	1.7 (0.80, 6.33)	<0.001**
No	Ref	
Respiratory disease		
No	0.61 (0.07, 5.02)	0.65
Yes	Ref	

4.3. School-Related Risk Factors for Depression Among Adolescents

An examination of influence the of school-related factors on depression compared with each different reference category shows that the odds of developing depression were significantly increased among students who had difficulty concentrating in school (OR=1.2, 95% CI: (0.73, 2.02); having trouble with the school laws and regulations in the last 12 months (OR= 1.8, 95% CI: 1.22, 2.62); students who had bad past life in schools the last 12 (OR=0.92, 95% CI: 0.01, 5.93). Results are in table 5.

Table 5. School-Related Factors for Depression among Adolescents.

Variable	O. R (95% CI)	p-value
Have difficulty in concentrating in school		
Yes	1.2 (0.73, 2.02)	0.023**
No	Ref	
Been in trouble with the school laws		
Yes	1.8 (1.22, 2.63)	<0.001**
No	Ref	
Scored low grades in exams recently		
Yes	1.3 (1.01, 14.59)	0.90
No	Ref	
How do you evaluate your school past life?		
Good	0.22 (0.01, 2.93)	0.52
Bad	0.92 (0.01, 5.93)	0.045
Average	ref	
I haven't been bullied at school in the past couple of months		
Yes	0.67 (0.03, 2.54)	0.2
No	Ref	

5. Discussion

Results showed that depression was three times, 1.5 times

and 1.2 times for adolescents who had no parents, those who had single-parents i.e. mother only and father only respectively compared to students who had both parents. This finding agrees with other studies done in Ethiopia which revealed that orphans have higher scores of depressive symptoms than non-orphans [19, 20]. In both cross-sectional studies, scores for depression among orphans is high as compared to non-orphans. A study [24] contrasts the findings of this study. The study showed that there was a high prevalence of depression among adolescents who lived with both parents compared those who had with mothers at 16.1%, as well as those who stayed with fathers alone at 12.1% [24]. More efforts should be put in place to screen for depression among orphaned adolescents so that effective interventions such as WBT may be tried out on orphans to investigate its effectiveness.

Findings of this study showed that adolescents whose parents were never married had nearly three times likelihood of developing depression than those whose parents were married. This is in agreement with a recent study [25], which found out that adolescents of single parents were more depressed than those whose parents were married [25]. The finding of this study may be attributed to the fact that lack social support as well physical and economic deprivation are characteristics of single parenthood that may lead to depression.

Findings revealed that having relationship problems was a predictor for depression. An experimental study [26], concurs with this finding that the friendship problems are a risk factor for depression. The reasons for higher depression levels among adolescents with friendship problems may be that adolescents determined their self-worth through the assessment of friends. The adolescents could also be depressed because they may have felt unwanted by the opposite sex. The adolescents may also feel like one failed relationship could indicate a failure in future relationships. Likelihood of depression after a break-up may be as a result of perverted interpretations of negative feelings related to with the friendship problems.

Findings further showed that poverty was a significant predictor of depression as adolescents from poor backgrounds were three times likely to be depressed. This was because with poverty, came other challenges such as lack of basic necessities like food, clothing school requirements among others. The lack of basic needs was likely to subject the adolescents to several uncertainties which may increase depression [27]. According to a study on socioeconomic factors may increase the level of depression among the adolescents [28], This finding is further supported by a Turkish study, with similar methodology, though different tools, which showed that children from poor backgrounds were more likely to be depressed [29].

Access to phones predicted depression as supported by studies such as Doyle et al. For this study, access to mobile phone led to increased social media presence which comes with other challenges [30]. The use social media may be related to unhealthy comparisons, repeated checking for

messages, likes and approvals which could be addictive, causing depression when the same are not available. Texting and sexting may also some of the reasons adolescents who had access to internet were likely to be depressed. A systematic review by Doyle et al., shows that sexting is a risky behaviour linked to depression [30]. However, there is a fact that social media may be used to create awareness on depression signs, and as well a measure social connectivity which is a protective factor for depression [8]. Parents and teachers should routinely know what adolescents access on phones. Future studies may be relevant to delve deeply into this matter.

The results of the biomedical risk factors showed that alcoholism, having HIV, and Anxiety, were significant predictors of depression among adolescents. The findings on HIV/AIDS were supported by the higher prevalence of depression that was reported among female adolescents (32.15%) than males (25.07%) [19]. An earlier cross-sectional study done in Ethiopia further supported the fact that there exists a higher prevalence of depression among the HIV-positive adolescents [20]. A study [13] among adolescent girls and young women in Western Kenya, show positive relations between depression and HIV/AIDS. The results showed that 34% of respondents had moderate to severe depression as a result of being HIV positive [13]. The positive correlation being HIV positive and depression in this study may be associated with struggles of storing medications while in schools, schools' personnel and friends who may spread the information, and concealing the HIV status even to closest friends.

Adolescents who had anxiety had three times likelihood of suffering from depression than those who were not. The reason for the findings may be as a result of similarity of the items in the tools used to measure depression and anxiety. The other reason for the comorbidity in this study could be attributed to similar etiological factors as well as negative processing of information in both disorders. This study finding was supported by a finding [8] conducted among adolescents in secondary schools in Nairobi City County. This finding showed that when working with adolescents with depression in schools, health workers should screen for anxiety symptoms.

Findings of alcoholism showed a statistical significance as adolescents who consumed alcohol were six times likely to suffer from depression as compared to those who did not. This finding was in agreement with a study [31] which revealed that there was a little, but a statistically significant positive relationship was found between depression and alcoholism [32]. These findings show that, when dealing with adolescents with the problem of alcohol use, depressive symptoms should be assessed. Conversely, adolescents with depression should be tested for alcohol use taking into consideration that depression may add to the risk of alcohol consumption.

Results on school-related risk factors showed that adolescents who had trouble with the school rules and regulations were close to two times likely to suffer from

depression unlike to who did not. This is because adolescents who broke schools' rules were likely to face punishments such as caning, manual work as others are in class, and name calling on the assembly. All these would lead to embarrassment which could lead to low self-esteem which could likely cause depression. Sometimes the failure to adhere to school rules would lead to exclusion through suspension and even at times expulsion. When the adolescents are suspended, they are likely to lose friends which could lead to loneliness that when prolonged could lead to depression. School exclusion may also increase the likelihood of school drop-out. This finding was supported by a study done in Nakuru county. In the Nakuru study, it was found that suspensions had great negative effect on students' PWB in which the lower PWB which could lead to depression [33].

Another significant risk factor for depression for adolescents in this study was having trouble in concentrating in school. Other studies have shown that depression decreases an individual's level of strength, increases chances of being fatigued and the prolonging of it could lead to depression. Depression could also reduce the capability of one's overall reasoning. All of these could influence one's motivation in life and thus a poor school achievement [2]. Difficulty in concentration would lead to poor academic performance which may lead in to depression.

In this study though, poor academic performance was not a predictor of depression in this study. Although statistical significance may not be causal in nature, the finding of this study contradicts another study conducted among 126 learners in high schools in Homa Bay county in Kenya which showed a significant relationship between depression and academic performance [7]. A number of suicide cases have been reported after release of national examinations in Kenya. One such case was of a form one student who committed suicide for having her geography marks displayed and mockery made out of it [34]. Another study is thus needed to confirm if indeed poor academic performance is not a predictor of depression in Kakamega County.

Bullying was not a predictor of depression in this study this contrasts a study done in a different county. The study showed that bullying and cyberbullying increase the risks for depression [35]. Adolescents in this study reported that bullying has significantly reduced in schools. The reason for the decreased bullying in secondary schools are also supported by qualitative data from this study reported that bullying has significantly reduced in secondary schools. This could be attributed to the punitive efforts in secondary schools for the bullies. The findings further contradict others that found that bullying significantly predicted depression among schools. Furthermore, schools have established support amongst students where senior students parent the new students. Because of the contradiction of findings, more studies are needed on the same subject matter.

6. Conclusion

The study concluded that psychological risk factors to

look out for were orphanhood, poverty, and coming from single parent families. Socio-economic empowerment programs may be targeted for such families. Parents and guardians may also need to be educated on the risk factors for depression among adolescents since some are parent-related. Access to internet predicted depression. Parents and guardians may need to provide guidance on internet usage to adolescents. Internet may also be adopted in created awareness on depression signs and even create avenues for management through social support groups. The study recommends frequent screening of depression among adolescents with comorbidities for detection and action. Social support programs may target orphans, adolescents from lower social classes and those from single parents. Students and school social support groups may be trained on social support for each other. Biomedical risk factors identified by this study were having HIV and Anxiety. Special attention may be given to such adolescents with these medical conditions. Alcohol consumption was significant and thus need to screen for depression among on alcoholic adolescents and depressed ones. School related risk factors identified in this study were trouble with school rules which could lead to suspension and even expulsion. Teachers and guardians may need awareness on appropriate punitive measures for adolescents. Adolescents who had trouble concentrating in schools were likely to be depressed.

Ethical Approval

Ethical approval to conduct this research was obtained from the Masinde Muliro University of Science and Technology Institutional Ethics and Review Committee (MMUST/IREC/192/2021). Approval for this study was acquired from the National Commission of Science and Technology, Ministry of Health, the Ministry of Education, as well as the Ministry of Interior Coordination.

Conflict of Interest

The authors declare no conflict of interest.

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