

Depression among Adolescents, Aged 13–19 Years, Attending Secondary Schools in Trinidad

Prevalence and Associated Factors

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ABSTRACT

Objective: To determine the prevalence of depression and psychosocial factors associated with depression in secondary school students in Trinidad.

Methods: This was a cross-sectional study of a stratified random sample of public secondary schools utilizing a modified pre-tested self-administered Beck Depression Inventory (BDI) to detect depression in students aged 13–19 years in Trinidad.

Results: In this study, 1290 students participated, a response rate of 79.6%; 43% were aged 13–15 years; 53.6% were Indo-Trinidadians; 82.5% were attending co-educational schools and 70.6% lived with both parents. The prevalence of depression was 25.3% \pm 2.37%. Chi-square analysis revealed statistically significant associations between depression and the categories of age, gender, living arrangements and school type. Similar findings were observed for respondents who admitted to cigarette and alcohol use or to being afraid of, or being injured by their parent ($p < 0.05$). Logistic regression indicated that females were 1.7 times as likely to be depressed when compared with males; respondents not living with both parents were 1.5 times as likely to be depressed as those who were. Respondents reporting that they were afraid of parents or of being injured by parents were three times as likely to be depressed as respondents who had not had those experiences.

Conclusions: One out of every four secondary school students in Trinidad was found to have significant depression. There were strong associations between depression and age, gender, school type and family structure. This study identifies that many adolescents experience violence in the home and those who did were more likely to be depressed.

Depresión Entre Adolescentes de 13 a 19 Años, que Asisten a las Escuelas Secundarias en Trinidad

Prevalencia y Factores Asociados

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RESUMEN

Objetivo: Determinar la prevalencia de la depresión y los factores psicológicos asociados con la depresión en estudiantes de las escuelas secundarias de Trinidad.

Métodos: El presente trabajo constituye un estudio transversal con muestreo aleatorio estratificado de escuelas secundarias públicas, utilizando un Inventario de Depresión de Beck modificado, auto-administrado y pre-probado, con el objeto de detectar depresión en estudiantes de 13 a 19 años de edad en Trinidad.

Resultados: En este estudio, participaron 1290 estudiantes, lo cual constituye una tasa de respuesta de 79.6%; 43% tenían de 13 a 15 años; 53.6% eran indo-trinidenses; 82.5% asistían a escuelas co-

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educacionales y 70.6% vivían con el padre y la madre. La prevalencia de la depresión fue $25.3\% \pm 2.37\%$. El análisis de chi-cuadrado reveló asociaciones estadísticamente significativas entre la depresión y las categorías de edad, género, ordenamiento de la vida y tipo de escuela. Hallazgos similares se observaron en encuestados que admitieron el uso del alcohol y cigarrillos, o tener miedo de sus padres, o haber sido herido por sus padres ($p < 0.05$). La regresión logística indicó que las hembras tenían una tendencia a deprimirse 1.7 veces mayor en comparación con los varones; los encuestados que no vivían con el padre y la madre presentaban una probabilidad de deprimirse 1.5 veces mayor que aquellos que vivían con ambos progenitores. Los encuestados que reportaron tener miedo de sus padres o haber sido físicamente lastimados por sus padres, presentaban una tendencia tres veces mayor a deprimirse que los encuestados que no habían pasado por esas experiencias.

Conclusiones: Se halló que uno de cada cuatro estudiantes de escuelas secundarias en Trinidad tenía una depresión significativa. Hubo fuertes asociaciones entre la depresión y la edad, el género, el tipo de escuela y la estructura de la familia. Este estudio identifica que muchos adolescentes experimentan violencia en sus hogares y los que tuvieron esa experiencia tenían una probabilidad mayor de sentirse deprimidos.

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INTRODUCTION

Adolescent depression should be considered when a previously well-performing youth does poorly in school, withdraws from society or displays acts of delinquency and senseless behaviour (1, 2). These symptoms are often associated with rebelliousness and may be seen by the family as a normal and temporary stage of the adolescent's development (2). As such, the recognition of depression in this age group may be delayed or never recognized until a crisis occurs. Other more classic symptoms include a sad countenance, reduced capacity for pleasure, feeling rejected and unloved, weight loss or gain, persistent self-blame and suicidal intention (1, 2).

Cross-sectional studies of adolescent self-reported depressive symptoms indicate that between 20–50% report significant, sub-syndromal levels of depression (1). 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 in functioning (2). Depression in adolescents tends, as in adults, to have episodes of remission and relapse, with the mean length of an episode being 7–9 months and remission occurring at 2 years. Seventy per cent will relapse by five years (2). Depressed mood in the adolescent carries a risk for a depressive disorder in later years. In a recent prospective study, in which a birth cohort of 1037 individuals was followed for 26 years to determine the presence of mental disease, 75% had already had a depressive disorder in adolescence or childhood (3). Depressed mood in the adolescent population is also associated with co-morbidities such as anxiety and conduct disorders (4), reduced academic performance, suicidal behaviour, homicidal ideation and alcohol/substance abuse (5).

In the Caribbean, adolescents (10–19 years) represent about 20% of the population or approximately 1 million people (6). Although the overall mortality rates in this population is low, 70/100 000 for Latin America and the Caribbean (6), this period represents a stage in the human life cycle when many of the lifestyle choices that affect the morbidity

and mortality of the future adult are made. It may be through understanding of this population that interventions that could impact positively on the health of Caribbean societies might be effected. Caribbean studies on adolescents have focussed extensively on risk behaviours: substance use (7–17), sexual issues (18–22) and sexually transmitted infection (23–26), suicide and parasuicide (27–31), teenage pregnancy (32–37) and lifestyle issues (38–40). Rage, violence and violence-related activity were captured in three reports (13, 14, 41). It might be expected that along with the risk factors described above, there might also be a depressive illness, however this is only now receiving attention in the Caribbean population (42–45). Our objective was to determine the prevalence of depression in secondary school students between the ages of 13–19 years in Trinidad and the factors associated with depression in this population.

SUBJECTS AND METHODS

Sample selection

Schools were stratified into single sex boys', single sex girls' and co-educational schools from a sample frame which included all secondary schools in Trinidad. The sample frame was obtained from the Ministry of Education. Using a table of random numbers, nineteen co-educational schools, two single sex boys' schools and two single sex girls' schools were chosen to provide 1304, 152 and 170 students from each type of school respectively. This represented suitable proportions of the respective schools and the final sample was expected to be representative of the adolescent population in Trinidad.

Average class size was found to be 35; in each school the instrument was applied to two classes which were selected from a list of all the classes in the school using a table of random numbers.

Inclusion criteria

Participants were secondary school students aged 13–19 years who were enrolled in the respective school in either of

the Forms 3, 4 or Lower 6. Other Forms were excluded because students were involved in examinations. Secondary schools were chosen only if they had a resident psychologist or teacher/counsellor available for consultation should a student become distressed while completing the questionnaire. Public secondary schools included both government and government-assisted (managed by religious organizations).

Research instrument

The “Beck Depression Inventory (BDI) Scale” has been tested and widely used in adolescents internationally (46). The questionnaire consists of 21 items, presented in multiple-choice format, which were used to measure the presence and degree of depression in adolescents. Each of the 21 items attempts to assess a specific symptom or attitude. Participants were asked to indicate the one answer which best reflects how he/she has been feeling during the two weeks preceding the day the questionnaire was filled out. Each questionnaire was then scored using a rating scale developed specifically for the BDI questionnaire.

Pre-testing of the BDI

Pre-testing of the BDI was carried out in two stages. In January 2003, the original BDI was administered to several students, similar to those who would participate in the study during May to June 2003. It then became evident that a few minor modifications were necessary in the language to better suit the understanding of younger participants. Changes were made to the standard BDI (Table 1).

Table 1: Modifications to the BDI (Beck’s Depression Inventory)

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1. In options 2.0 and 5.0, the word ‘particularly’ was omitted.
 2. In option 5.0, the phrase ‘a good part of’ was replaced by the word ‘some’.
 3. Option 11.0 was changed from ‘I am no more irritated by things than I ever was’ to read ‘I am not more irritated than usual’.
 4. In option 11.2, the phrase ‘a good deal’ was replaced by the words ‘most of’.
 5. In option 13.0, the phrase ‘I ever could’ was changed to ‘usual’
 6. In option 14.1, the word ‘older’ was omitted – since the scale will only be administered to students aged 13–19 years.
 7. Responses to item 18 were changed as follows:
 - I eat as much as I usually do
 - I don’t eat as much as I used to
 - I eat much less than usual
 - I don’t feel like eating at all
 8. The responses to the last item (21) were changed to reflect the participant’s interest in the opposite sex rather than an interest in sex. There was a general feeling that parents, teachers and principals would be more comfortable with this new phrasing.
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In stage 2, the BDI was then pre-tested on students between the ages of 13–19 years from a school that was not selected as part of the sample. The instrument was then administered as described in the section on data collection below. Students were randomly selected from a Form 3 class and a psychiatrist privately interviewed each of the students

and made a diagnosis of whether the student had major or no major depression using DSM IV criteria. The interviewing psychiatrist was blinded to the results of the completed BDI. The diagnoses made by the psychiatrist and the BDI scale were compared to determine the true positives, true negatives, false positives and false negatives. From this 2 x 2 table, sensitivity and specificity of the modified BDI was determined for a cut-off point of 16 on the BDI.

Data collection

Selected schools were called in advance to set an appropriate date and time for the questionnaire to be administered. It was confirmed that a school counsellor or the principal or a teacher would be present when the instrument was being administered should any student become distressed. On the chosen day, the principal and the teachers whose classes were selected were shown the letters of approval and they were told about the nature of the study. An introductory letter was read to the students. Any questions that the students had were answered at this time. The instrument was distributed by a group member and supervised by a teacher and at least two members of the research group. On completion, the questionnaire was folded and placed in a sealed box to ensure confidentiality.

The project was carried out by a group of medical students under the supervision of the first author of this paper as part of a compulsory project in years 2 and 3 of medical school training. The protocol was reviewed and permission was obtained from the Ministry of Education and from the Faculty of Medical Sciences’ Ethics Committee. The Ministry of Education provided approval for the students to participate. On the day the questionnaire was administered, students were informed by school personnel and the researchers on the nature of the study. Participants were given the options to participate or not but individual written consent was not requested.

Statistical analysis

Data from completed BDI questionnaires were entered into SPSS version 12 for analysis. The prevalence of depression in this population was determined. Chi-square analysis was used to ascertain if there were statistically significant differences between categorical independent variables and the presence or absence of depression. Chi-square analysis was also used to analyze the relationship between age and gender on risk behaviours, violence in the home and family living arrangements.

Binary logistic regression was applied to determine which of the dichotomized independent factors – gender, whether respondents lived with their parents, whether respondents smoked cigarettes or used alcohol and whether respondents were afraid of their parents or had been injured by their parents – predict the likelihood of a dichotomous dependent outcome (depression with a score of 17 and more on the BDI *versus* no depression with score of 16 and less).

RESULTS

Sixty-eight students participated in the second stage of the pre-testing of the modified BDI. There were 2 true-positives, 4 false-negatives, 57 true-negatives and 5 false-positives. This gave a sensitivity of 33% and a specificity of 92% for a cut-off of 16 on the BDI. There were 1290 students aged

13–19 years who participated, a response rate of 79.3%. Of the sample, students aged 13–15 years made up 43%; 53.6% were Indo-Trinidadian, 82.5% were attending co-educational schools and 70.6% lived with both parents. Further descriptions of the population can be found in Table 2. The prevalence of depression was $25.3\% \pm 2.37\%$. Chi-square analysis

Table 2: Depression and various demographic categories in adolescents aged 13–19 years in Trinidad.

	Categories n = 1290 (%)		Depression (%)	No depression (%)
Age/years	13–15	559 (43.3)	327 (25.3)	963 (74.7)
	16–17	509 (39.5)	134 (24.0)	425 (76.0)
	18–19	166 (12.9)	128 (29.1)	361 (70.9)
	Non-respondents	166 (12.9)	31 (18.7)	135 (81.3)
Gender	Male	537 (41.6)	14 (25.0)	42 (75.0)
	Female	751 (58.2)	104 (19.4)	433 (80.6)
	Non-respondents	2 (0.2)	223 (29.7)	528 (70.3)
			0 (0)	2 (100)
Ethnicity	Afro Trinidadian	245 (19.0)	52 (21.2)	193 (78.8)
	Indo Trinidadian	691 (53.6)	175 (25.3)	516 (74.7)
	Mixed	330 (25.6)	95 (28.8)	235(71.2)
	Other	23 (1.8)	5 (21.7)	18 (78.3)
	Non-respondents	1 (0.1)	0 (0)	1 (100)
Religion	Anglican	57 (4.5)	13 (22.8)	44 (77.2)
	Catholic	272 (21.3)	59 (21.7)	213 (78.3)
	Hindu	306 (32.8)	12 (26.8)	306 (73.2)
	Muslim	121 (9.5)	29 (24.0)	92 (76.0)
	Other	407 (31.9)	108 (26.5)	299 (73.5)
Living	Both parents	909 (70.5)	206 (22.7)	703 (77.3)
Arrangements	Not living with both parents	379 (29.4)	121 (31.9)	258 (68.1)
	Non-respondents	2 (0.2)	0 (0)	2 (100)
School type	Single sex male	126 (9.8)	32 (25.4)	94 (74.6)
	Single sex female	100 (7.8)	15 (15.0)	85 (85.0)
	Co-educational	1290 (82.5)	280 (26.3)	784 (73.7)
Seriously injured by parent	Yes	81 (6.3)	46 (56.8)	35 (43.2)
	No	1198 (92.9)	278 (23.2)	920 (76.8)
	Non-respondents	11 (0.9)	3 (27.3)	8 (72.7)
Afraid of parent or guardian	Yes	189 (14.7)	93 (49.2)	96 (50.8)
	No	1094 (84.8)	228 (20.8)	866 (79.2)
	Non-respondents	7 (0.5)	6 (85.7)	1 (14.3)
Thought about running away from home	Yes	478 (37.1)	209 (43.7)	269 (56.3)
	No	799 (61.9)	113 (14.1)	686 (85.9)
	Non-respondents	13 (1.0)	5 (38.5)	8 (61.5)
Smokes cigarettes	Yes	114 (8.8)	52 (45.6)	62 (54.4)
	No	1175 (91.1)	275 (23.4)	900 (76.6)
	Non-respondents	1 (0.1)	0 (0)	1 (100)
Uses alcohol	Yes	461 (35.7)	151 (32.8)	310 (67.2)
	No	825 (64.0)	175 (21.2)	650 (78.8)
	Non-respondents	4 (0.3)	1 (25.0)	3 (75.0)

revealed statistically significant associations between depression and the categories age, gender, living arrangements, whether the student was afraid of or injured by their parent, cigarette and alcohol use and school type ($p < 0.05$).

Table 3 illustrates the results of the chi-square test *ie* the association between depression and common demo-

Table 3: Results of χ^2 analysis for association between categorical independent variables and the presence or absence of depression among adolescents in Trinidad, aged 13–19 years, attending secondary schools.

Variable	Depression or No Depression		
	χ^2	df	<i>p</i> value
Age	8.210	3	0.042
Gender	17.628	1	0.001
Ethnicity	4.421	3	0.312
Religion	2.998	4	0.558
Living arrangements	12.118	1	0.001
School type	6.186	2	0.045
Injured by parents	45.243	1	0.001
Afraid of parents	69.120	1	0.001
Thought of running away	138.783	1	0.001
Smokes cigarettes	27.075	2	0.001
Drinks alcohol	20.822	1	0.001

graphic characteristics and variables. There were no statistically significant associations for the presence of depression and ethnicity, religion, binge drinking and the respondent’s numerical position in the family.

Risk behaviours

When risk behaviours were analysed by age and gender, 8.8% of respondents admitted to smoking and 35.7% admitted to alcohol use. Higher alcohol use was reported in the 18–19-year age group (45.2%) and 16.8% of those who admitted to alcohol use also admitted to heavy drinking (more than 5 drinks in one sitting). This behaviour was also more common in the 18–19-year age group. Males were more likely to admit to smoking cigarettes (11.9% *vs* 6.7%, $p < 0.05$) or alcohol use (39.1% *vs* 33.5%, $p = 0.021$) and to heavy drinking (59.7% *vs* 37.3%, $p < 0.001$).

Violence in the home

While 14.7% of respondents reported being ‘afraid of their parents’ and 6% admitted to ‘being injured by their parents’ this was not statistically significant across the different age groups. However, when analysed by gender, females were more likely to report being afraid of their parents (18.8% *vs* 9.2%, $p < 0.001$) and were also more likely to admit to thinking about running away from home (43.4% *vs* 29.0%, $p < 0.001$). Males were more likely to report being injured by their parents (7.0% *vs* 5.9%, $p > 0.05$).

Family arrangements and risk behaviours

Respondents who lived with both parents were equally likely to smoke as those who were not living with both parents

(8.6% *vs* 9.5%) but less likely to report alcohol use (32.9% *vs* 42.9%, $p < 0.001$). However, if they lived with both parents and did report drinking, they were more likely to be involved with binge drinking (50.8% *vs* 41.3%, $p = 0.031$). Respondents who lived with both parents were less likely to report thinking about running away from home (32.9% *vs* 48.3%, $p < 0.001$) and less likely to report being injured by their parent (5.1% *vs* 9.4%, $p = 0.004$). However, respondents who lived with both parents were just as likely to report ‘being afraid of their parent’ (14.7% *vs* 14.9%).

Logistic regression

Logistic regression was used to determine the independent variables for which depression had greater odds of being present. The results indicate that females were 1.7 times as likely to be depressed when compared with males; respondents not living with both parents were one and a half times as likely to be depressed than those living with their parents. Respondents reporting that they were afraid of parents or being injured by parents were three times as likely to be depressed as respondents who had not had those experiences. Similarly, respondents admitting to using cigarettes or alcohol were 2 and 1.5 times, respectively as likely to be depressed as those not using these substances. The 95% CI are shown in Table 4.

Table 4: Results of binary logistic regression analysis to determine the independent variables associated with the presence of depression among adolescents in Trinidad.

Independent Variable	Odds Ratio (95% CI)	<i>p</i> value
Gender		
Male <i>vs</i> Female	1.71 (1.28–2.28)	0.001
Living arrangements		
Living with both parents <i>vs</i> Not living with both parents	1.50 (1.21–1.99)	0.006
Violence in the home		
Not injured by parent <i>vs</i> injured by parent	3.10 (1.88–5.11)	0.001
Not afraid of parent <i>vs</i> afraid of parent	2.96 (2.10–4.18)	0.001
Risk behaviours		
No use of cigarettes <i>vs</i> use of cigarettes	2.17 (1.37–3.42)	0.001
No use of alcohol <i>vs</i> use of alcohol	1.53 (1.14–2.05)	0.004

DISCUSSION

This study of a random sample of 1290 adolescents aged 13–19 years attending secondary schools in Trinidad found that 25% were depressed. Depression was associated statistically with age, gender, school-type and family structure ($p < 0.05$) but not to ethnicity, religion, binge drinking or the

student's position in the family. Chi-square analysis found a statistically significant association between depression and age, with the older students at 19 years being less likely to be depressed; being female was also associated with greater reporting of depression. Students attending single sex female schools and co-educational schools were more likely to be depressed when compared to single sex male schools. Chi-square analysis also revealed the link between violence in the home and depression, with students who had been injured by parents or those who were afraid of their parents being more likely to suffer from depression ($p < 0.05$).

This study supports the results found in another survey of adolescents conducted in Trinidad and Tobago (27). Maharajh *et al* in a stratified random sample of 1845 adolescent students from 24 schools, applied the Reynolds Adolescent Depression Scale and found 14% of their sample to be depressed. In that study, depression was 2.18 times more likely to occur in females; here the ratio of females to males was 1.7:1. Both studies also indicated that the age reporting the highest prevalence of depression was 16 years. In that study, students living with intact families had the lowest rate (11.7%) while the reconstituted (living with a father and stepmother or mother and stepfather) family had the highest rate (25.7%) of depression. Similarly, the present study reveals that among those who lived with guardians or single parents, the rate of depression was higher than those living with two parents (35.6% vs 26.0%). As in this present study, there were no ethnic differences in depression. Further analysis of that study is reported elsewhere (29).

This present paper adds to previous studies on the issue of abuse and violence in the home, with students who had been injured by parents or those who were afraid of their parents having significantly higher scores on the BDI. Other recent studies among Caribbean adolescent populations are supporting the view that many risk behaviours may be driven by a history of physical and sexual abuse, rage (defined as a continuous desire to hurt someone and being angry much of the time) and a lack of family and school connectedness. In the Caribbean Youth Health Survey conducted on 15 695 youths aged 10–18 years in 9 countries, rage was the strongest risk factor for every health-compromising behaviour for both genders and across all age groups (13). School connectedness was the strongest protective factor. Family connectedness and religious attendance had roughly equivalent protective association. Further, when reported rage, skipping school and abuse were present, reported violence occurred in 91% of males and 77% of females versus 22% and 8% for each gender respectively when none of the risk factors were present. When no protective factors such as family connectedness, school connectedness and religious attendance were present, 68% and 76% of males and females respectively reported violent behaviour.

What approach has been used to deal with the health of adolescents? The international literature suggests that strategies incorporating positive youth development, assets and/or

resilience have a greater likelihood of improving the health outcomes of adolescents than risk-reduction alone. Additionally, interventions that involve a parent have also been shown to be effective (47). Four studies on interventions in adolescents attempting to engage safe sexual activity at the school level in Caribbean populations have illustrated that the education-based interventions are poorly effective, especially over periods greater than 12 months (48–51). This may make the case for resilience factors to be the focus in the future. This study has several limitations; these include the low sensitivity and the small sample available for pre-testing the modified Beck scale. The low sensitivity suggests that the modified BDI may not be detecting the true number of depressed participants. However, the result did suggest a high specificity and so the ability of the test to rule out depression is useful.

The response rate was adequate, just below 80%, but we have no information about non-responders, similarly we have no information about adolescents who are skipping school or who have permanently left school for disciplinary or economic reasons. Yet this study's findings are supported from other local and international studies on adolescent depression and add useful information pertaining to the role of violence in the home in promoting depression in adolescents. The proportion of East Indian respondents is above that reported in census statistics (39–40% vs 53.6% in this present survey). However, the relative proportion of depression in the two major ethnic groups (African and East Indian) is similar.

From a national policy perspective, the research is suggesting that efforts that encourage and strengthen families may have a positive impact on the apparent high levels of risk behaviours and depression in adolescents. Additionally, the results have shown that depression in some students could be linked to their home environment, for example, their family structure and possible physical abuse.

Which intervention does the international literature recommend for adolescent depression? A recent meta-analysis found 29 studies that addressed anxiety and depression in young people from 10–19 years and one in children aged 6 years (52). These 30 studies applied a variety of interventions including cognitive-behavioural strategies, dealing with interpersonal relationships and conflict, educational strategies, depression and mood disorders, problem-solving skills, alcoholism and grief, monitoring moods, developing family-school partnerships and school based resilience programmes, and parent education, among others. The authors reported that both selective interventions (which target individuals at elevated risk for depression because of the presence of family factors such as divorce or parental death) or indicated interventions (where participants already exhibit sub-clinical signs and symptoms of depression) were more effective than universal programmes (generally presented to an entire school and focusses on cognitive and behavioural skills training, cognitive re-structuring, curri-

culum redesign, among others) in the period immediately following the intervention. However, the effect size for selective and indicated interventions was small to moderate, both in the immediate and follow-up period (up to 6 months). This implies that screening and selecting individuals for interventions may be successful in the Trinidadian context. There would be the need for school counsellors and resources for follow-up and referral, if necessary. The danger here however is the stigmatizing of individuals and families and subsequent high drop-out rates (52).

Finally, this type of information should be widely publicized in the national community through health promotion drives as is done for HIV/AIDS and drug use. This knowledge should be used to drive greater individual knowledge and so increase individual, family and community responsibility to national development through supportive and secure environments for the adolescent. Future studies should look at the success of such interventions.

In conclusion, this survey has found that the rate of depression (as determined by the BDI) in adolescents aged 13–19 years in Trinidad is 25.3%. Depression is associated with age, gender, living arrangements and school type. Respondents who admitted to cigarette and alcohol use or to being afraid of, or being injured by their parent were also more likely to be depressed. Females were 1.7 times as likely to be depressed when compared with males; respondents not living with both parents were 1.5 times as likely to be depressed as those who were. Respondents reporting that they were afraid of parents or had been injured by parents were three times as likely to be depressed as respondents who had not had those experiences.

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