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Original Research Article

Influence of Dietary Practices on Suicidal Thought and Planning among Adolescents in Ghana

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ABSTRACT

The purpose of the study was to investigate the influence of dietary practices on suicidal thought and planning among Ghanaian junior high and senior high school students. Participants were 3031(1650 boys and 1381 girls) adolescents aged 11-18. The 2012 Ghana Global School-Based Student Health Survey served as the data collection instrument. The predictor variables were gender, being hungry (HNG), body mass index (BMI), and the number of times parents understood adolescents' problems (APS). The response variables were suicidal thought and suicidal planning. Even though higher percentages of girls reported suicidal thought (51.93%) and suicidal planning (50.76%), boys had higher odds than girls of having suicidal thoughts and planning suicide. Logistic regression analyses indicated gender, HNG, and APS, were significant predictors of suicidal thought and planning. BMI predicted suicidal thought but not suicidal planning. Adolescents with higher BMI were more likely to report suicidal thoughts than those with lower BMI. Furthermore, those who were hungry "most times" had higher odds of reporting suicidal thoughts and planning than those who were never hungry.

Keywords: Adolescents, dietary practices, Ghana, odd ratio suicide.

INTRODUCTION

Suicide is, unarguably, a public health burden in sub-Saharan Africa. [1] Suicide in sub-Saharan countries may be under-reported, [2] since it is a criminal offense in many countries of the region (Ovuga et al., 2005). [3] Suicide is defined as an intentional self-inflicted death. [4] Psychosocial factors associated with suicide include poor mental health, poverty, being bullied, substance use and having poor relationships with parents. [5-7] These psychosocial factors become intense during adolescence. [8]

Historically, studies have investigated suicidal ideation or thought in terms of other risk factors such as hunger. Researchers and scholars have coined the concept of suicidal process in an attempt to better define suicide. Suicidal process is a sequence that goes from suicidal ideation (ideas or thoughts), to plans, then to attempts and ultimately, death, through a particular action. [9]

Nutritional status is critical in the growth and development of children and adolescents. Research shows 36% of the children under age five were malnourished in Ghana in 1990. [10] Specifically, [11] reported 14% and 28% of Ghanaian preschoolers to be underweight and stunted respectively. Another study showed that 44% of school-aged children in one region of the country were stunted with 70% of them being anemic. [12] It is in this light that Ghana (like other sub-Saharan

countries) have implemented school feeding programs to mitigate the negative effects of food deprivation in children. [13]

Perceived weight status has been shown to significantly correlate with suicidal thoughts among middle school boys and girls. [14] Childhood obesity is a major cause of anxiety among school children and adolescents, as those perceived as obese are systematically discriminated against. Consequently, the obese students tend to develop a negative self-image that appears to persist into adulthood. [15] Thus, the fight against childhood obesity should be a concern for schools, since there is high probability that obese children will become obese adults. [16] Therefore, it is important that schools should have intervention programs to fight childhood obesity.

Gender and age are key demographic risk factors for suicide. Males are more likely than females to commit suicide, whereas females are more likely than males to attempt suicide. [4] The likelihood of committing suicide increases with age. [4] However, suicide among adolescents is on the increase, [17] as it is the third leading cause of death among adolescents worldwide. [18]

Psychosocial and family factors have also been found to be associated with suicidal expression. These factors include anxiety, loneliness, and signs of depression, parent involvement, tobacco use, and substance use and alcohol misuse. [19-21] Early adolescents have been found to be particularly vulnerable to the psychological effects of bullying. [22]

The purpose of the present study, therefore, was to investigate the influence of dietary practices on suicidal thought and suicidal planning among junior high and senior high school adolescent students in Ghana. An understanding of the effects would help in identifying effective suicide prevention programs for schools in Ghana.

MATERIALS AND METHODS

Participants for the study included 3031Ghanaian junior high (1648) and senior high (1383) school students aged 11-18. There were 1650 boys and 1381 girls. The authors deleted some data due to missing data for variables that were assessed in the study.

The study utilized the 2012 Ghana Global School-Based Student Health Survey (GSHS) as the data source. [23] The study investigated the extent to which participants thought about suicide and planned to commit suicide. The predictor variables were gender, being hungry (HNG), body mass index (BMI), and the number of times parents understood adolescents' problems (APS). HNG was assessed by the item, "During the past 30 days, how often did you go hungry because there was not enough food in your home?" The authors calculated BMI from the body weights and heights that students self-reported. The extent to which parents or guardians understood adolescents' problems was measured by the item, "During the past 30 days, how often did your parents or guardians understand your problems and worries?"

The response variables used in the present study were suicidal thought and suicidal planning. Suicidal thought utilized the item, "During the past 12 months, did you ever seriously consider attempting suicide?" and the item, "During the past 12 months, did you make a plan about how you would attempt suicide?" was used to measure suicidal planning.

Schools were categorized into strata. Stratum was assigned stepwise, starting from schools with the largest enrolment of students. Each stratum consisted of one or two schools based on the size of the school. [23]

Statistical Analysis

The study utilized two-way tables to classify and count participants by the extent to which they thought about suicide. Similarly, two-way tables were used to classify and determine the number of participants by the extent to which they planned suicide. In addition, the conditional percentage of the dependent variables by each predictor variable was computed. [24]

Furthermore, the percentage distribution of each predictor variable was calculated for each level of the dependent variables. The authors calculated the conditional percentage of a dependent variable by each predictor variable. [24] The percentage distribution of each predictor variable was computed for each level of the dependent variables.

The authors used binary logistic regression to model the relationship between each of the dependent variables and the predictor variables. This model was deemed appropriate because the response outcomes (suicide thought and suicidal planning) were dichotomous. That is, each response variable can take one of two possible outcomes representing "yes" or "no" to suicide thought or suicide planning. In the analysis, we estimated two logistic regression models where we allowed for both no stratum and stratum effects.

Statistical significance of the predictor variables on each of the dependent variables were established using odds ratio and the associated (1-alpha) % confidence interval from the estimated model. [25] Alpha represented the level of significance. Studio version 0.98.1103 statistical package was used for all data analyses. [26]

BMI and suicidal thought and planning

Table 1: Frequency and percentages for BMI, suicidal thought and planning

	Suicidal Thought		Suicidal Planning	
BMI	**Yes**	**No**	**Yes**	**No**
Number	543	2488	658	2373
Mean	20.69	20.18	20.45	20.22
Standard Deviation	3.27	2.94	2.83	3.06
Minimum	13.5	13.15	13.5	13.15
Maximum	53.98	54.88	37.65	54.88

Table 1 presents descriptive data on BMI and suicidal thought and planning. Students who indicated they had suicidal thoughts and planned to commit suicide had higher mean BMI scores than their counterparts who did not. Students who reported suicidal thought had a mean BMI of 20.69 while those who did not had a mean score of 20.18. Similarly, those who planned to commit suicide had a BMI mean score of 20.45 and those who did not had a mean score of 20.22. Overall, 17.91% and 21.71% of the participants in the present study reported suicidal thoughts and suicidal planning respectively.

Gender, being hungry, APS, and suicidal thought and planning

Table 2 shows descriptive data on gender, being hungry and suicidal thought and planning. A higher percentage of females (51.93%) than males (48.07%) indicated they thought about suicide. Similarly, 50.76% of females and 49.24% of males indicated they planned to commit suicide in their lifetime.

Participants who indicated they sometimes went hungry past 30 days had the highest percentage of students indicating that they had suicidal thoughts (45.12%) and planned to commit suicide (48.18%). Similarly, adolescents who reported that their parents or guardians sometimes understood their problems and worries had the highest percentages of participants who had suicidal thoughts (30.39%) and suicidal planning (32.67%).

Predictors of suicidal thought and planning

Table 3 presents the logistic regression data for each variable in the study. The analyses showed that gender, HNG, APS, and BMI were significant predictors of suicidal thought. Males had higher odds than females to have suicidal thoughts and to plan suicide. In addition, all the predictor variables significantly predicted suicidal planning, except BMI. BMI was not a significant predictor of suicidal planning. The "never" being hungry category was used as the reference or comparison group for HNG. There was a significant difference between those who were never hungry and those who were hungry "most times." Adolescents who were hungry most of the time were more likely to report suicidal thoughts and suicidal planning than those who were never hungry. Adolescents who were "always" hungry significantly predicted suicidal planning, but not suicidal thoughts. That is, they were more likely than those who were never

hungry, to report suicide planning.

There was a significant difference between participants who indicated their parents never understood their problems and worries and those who reported their parents "always" understood their problems. Adolescents whose parents "always" understood their problems and worries were approximately 63% less likely to have suicidal thoughts and 73% less likely to report suicidal planning.

BMI significantly predicted suicidal thought but not suicidal planning. The likelihood of having suicidal thought increased by approximately five percent when BMI increased by one unit.

Table 2: Frequencies and percentages for gender, HNG, APS, and suicidal thought and planning

	Suicidal Thought		Suicidal Planning	
Gender	**YES (%)**	**NO (%)**	**YES (%)**	**NO (%)**
Male	261 (48.07)	1389 (55.83)	324 (49.24)	1326 (55.88)
Female	282 (51.93)	1099 (44.17)	334 (50.76)	1047 (44.12)
Total	543 (100.00)	2488 (100.00)	658 (100)	2373 (100)
Being Hungry				
Never	171 (31.49)	924 (37.14)	188 (28.57)	907 (38.22)
Rarely	24 (4.42)	154 (6.19)	39 (5.93)	139 (5.86)
Sometimes	245 (45.12)	1126 (45.26)	317 (48.18)	1054 (44.42)
Most times	71 (13.06)	181 (7.27)	70 (10.64)	182 (7.67)
Always	32 (5.89)	103 (4.14)	44 (6.69)	91 (3.83)
Total	**543 (100.00)**	**2488 (100)**	**658 (100)**	**2373 (100.00)**
Parents understood adolescents' problems				
Never	134 (24.68)	503 (20.22)	151 (22.95)	486 (20.48)
Rarely	56 (10.31)	178 (7.15)	63 (9.57)	171 (7.21)
Sometimes	165 (30.39)	796 (31.99)	215 (32.67)	746 (31.44)
Most times	85 (15.65)	372 (14.95)	100 (15.20)	357 (15.04)
Always	103 (18.97)	639 (25.68)	129 (19.60)	613 (25.83)
Total	**543 (100.00)**	**2488 (100.00)**	**658 (100.00)**	**2373 (100)**

Table 3: Logistic regression for gender, HNG, APS, BMI, and suicidal thought and planning

	Suicidal Thought		Suicidal Planning	
	Model 1 (No Stratum)	**Model 2 (Stratum)**	**Model 1 (No Stratum)**	**Model 2 (Stratum)**
Parameters	**OR (95% CI)**	**OR (95% CI)**	**OR (95% CI)**	**OR (95% CI)**
Intercept	0.079 (0.041, 0.150)	0.082 (0.040, 0.166)	0.144 (0.078, 0.268)	0.120 (0.061, 0.237)
Gender (Ref: Female)	1.306 (1.077, 1.583)	1.296 (1.064, 1.578)	1.284 (1.074, 1.536)	1.256 (1.046, 1.507)
Being hungry(Ref: Never)				
Rarely	0.783 (0.482, 1.224)	0.801 (0.491 ,1.258)	1.284 (1.074, 1.536)	1.288 (0.859, 1.897)
Sometimes	1.148 (0.925, 1.427)	1.147 (0.922, 1.430)	1.292 (0.864, 1.895)	1.399 (1.140, 1.721)
Most times	2.036 (1.467, 2.806)	2.055 (1.474, 2.847)	1.414 (1.155, 1.735)	1.739 (1.253, 2.398)
Always	1.663 (1.065, 2.539)	1.567 (0.998, 2.408)	1.794 (1.297, 2.464)	2.180 (1.450, 3.239)
Parents understood adolescents' problems(Ref: Never)				
Rarely	1.274 (0.884, 1.821)	1.275 (0.882, 1.829)	1.243 (0.876, 1.750)	1.275 (0.896, 1.803)
Sometimes	0.778 (0.602, 1.006)	0.783 (0.605, 1.015)	0.923 (0.727, 1.174)	0.934 (0.734, 1.189)
Most times	0.889 (0.653, 1.206)	0.850 (0.621,1.158)	0.939 (0.702, 1.253)	0.915 (0.680, 1.227)
Always	0.634 (0.476, 0.844)	0.636 (0.476, 0.847)	0.719 (0.550, 0.938)	0.726 (0.555, 0.950)
Body Mass Index	1.046 (1.015, 1.078)	1.044 (1.012, 1.076)	1.018 (0.988, 1.047)	1.014 (0.985, 1.044)

Note: 95% CI containing one is not statistically significant

DISCUSSION

The prevalence of suicidal thought and planning among adolescents in the current study was higher than previously reported. [27] The percentages of Ghanaian school-going adolescents who reported suicidal thought and planning in 2008 were 14.6% and 15.4% respectively. [27] In addition, higher percentages of females reported suicidal thought and planning than males. However, males had higher odds of thinking about suicide and planning to commit suicide. This finding is consistent with previous studies. [28] However, other research reported that females were more likely to have reported planning a suicide attempt. [29,30]

Consistent with prior research, the current study found that being hungry was a significant predictor of suicidal thought and planning. [5] However, it contrasts other previous research that reported no association between being hungry and suicidal behavior. [30] Adolescents' ability to

influence their own nutrition-related behaviors is limited because they have less resources than adults, and they often are on their own than younger children [31] approximately, 30% of the population in Africa are undernourished, with the sub-Saharan sub-region being the most affected. [32] In response to food insecurity, many countries in the sub-region have established school feeding programs in attempts to lessen hunger and its negative effect on the nutritional status and learning capacity of students. [13] However, the school feeding program concept serves only as an intervention for eliminating hunger in the short run. Therefore, stakeholders in Ghana need a concerted effort to curb the prevalence of hunger, especially among adolescents as part of a suicide prevention program.

The finding that BMI predicted suicidal thought is in line with previous research that showed the link between weight-based teasing and adolescent suicidal thought. [13] However, it conflicts with the finding that weight-based teasing was associated with suicidal attempt. [13] The relationship between obesity and suicide seems to be more complex than previously thought due to the influences of confounding variables such as self-esteem, social isolation, parental neglect, and anxiety. [14] For example, [33] reported a reciprocal relationship between obesity and depression. That is, obesity was found to increase depression; and depression was, in turn, reported to predict the development of obesity. School-based obesity programs that focus on multi-components are more effective [34] that single-component programs such as physical activity or nutrition only programs [35]

In line with previous research, [30] the current study found that adolescents whose parents understood their problems and worries "always" were less likely to report suicidal thoughts and planning than those whose parents "never" understood their problems. Research indicates that perceived parental involvement and family support for school are associated with low suicide-risk behaviors. [36] It is important for adolescents to have secured attachments to their parents and guardians as high levels of trust and communication decreased the risk of suicide among adolescents. [37]

A major recommendation for future research would be to include an item on the questionnaire that assesses adolescents' ability to access food in school. As [30] suggests, although some participants reported not having enough food in the home, they might have had enough food while in school. Another recommendation is for schools to utilize multi-component suicide intervention programs as these have been shown to be more effective than single-component programs. [34] Furthermore, research has shown that multifaceted school-based psychosocial programs can promote social-emotional competence than single-component programs. [38]

CONCLUSION

In conclusion, gender, being hungry, and parents' understanding of adolescents' problems and worries were significant predictors of suicidal thought and planning. While suicidal thoughts and planning were more prevalent among girls, boys had higher odds than girls of reporting suicidal thoughts and planning. Next, adolescents who were hungry most of the time had higher odds of reporting suicidal thoughts and planning than those who were never hungry. Furthermore, adolescents whose parents always understood their problems were less to report suicidal thought and planning than those whose parents did not. Finally, BMI predicted suicidal thought but not suicidal planning. Adolescents with lower BMI were less likely to report suicidal thoughts than those with higher BMI.

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