



Original article

Correlates of Suicide Among Middle and High School Students in Ghana

 Enoch Kordjo Azasu, M.B.A., M.S.W.^{a,*}, and Sean Joe, M.S.W., Ph.D.^b
^aGeorge Warren Brown School of Social Work, Washington University in St. Louis, Saint Louis, Missouri

^bBenjamin E Youngdahl Professor of Social Development, George Warren Brown School of Social Work, Washington University in St. Louis, Saint Louis, Missouri

Article history: Received February 19, 2022; Accepted September 7, 2022

Keywords: Suicide; Ghana; Students; Adolescents



A B S T R A C T

Purpose: We know little about the epidemiology of suicide among middle school students in Ghana, including the years preceding high school. This study explores the onset, characteristics, and recent patterns of suicide among Ghanaian middle and high school students.

Methods: This study used the World Health Organization Global School-based Student Health Survey (GSHS, 2012), which has self-reported measures on suicide ideation, plan, and attempt of middle and high school students in Ghana. Correlation and logistic regression analyses were performed using Statistical Package for the Social Sciences (SPSS version 25).

Results: The study found prevalence of suicidal behaviors among the population as follows: ideation (19%), plan (22%), and attempt (25%). Suicide ideation significantly increased the risk for suicide plan (odds ratio [OR] = 9.14; 95% confidence interval [CI] = 7.57–11.02) and attempt (OR = 11.89; 95% CI = 9.82–14.38), whereas suicide plan significantly increased the odds of suicide attempt (OR = 12.64; 95% CI = 10.50–15.19). There was a higher prevalence of suicide ideation, plan, and attempts among middle school students than high school students although only suicide attempt differences were significant (28.4% > 22.3%; $\chi^2 = 17.1, p < .001$).

Discussion: The onset of suicide among Ghanaian students occurs at younger ages than previously thought, and there were increasing trends in suicide behaviors as age increases. This finding highlights a potential suicide crisis among preteens, which warrants attention. Additional studies are needed to observe these increasing trends, identify risk, protective, and precipitating factors to help prevent suicide among these children.

© 2023 Published by Elsevier Inc. on behalf of Society for Adolescent Health and Medicine. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

IMPLICATIONS AND CONTRIBUTION

This study adds to the literature on suicide among Ghanaian adolescents. It adds information to the correlates, risk and protective factors as well as how suicide is changing over time to know who is most at risk.

Conflicts of interest: The authors have no conflicts of interest to declare.

Disclaimer: This article was published as part of a supplement supported by the National Institute of Mental Health. The opinions or views expressed in this article are those of the authors and do not necessarily represent the official position of the funder.

* Address correspondence to: Enoch Kordjo Azasu, M.B.A., M.S.W., Research & Resiliency Training Fellow, Race and Opportunity Lab, George Warren Brown School of Social Work, Washington University in St. Louis, Goldfarb Hall, Room 36, One Brookings Drive, Saint Louis, MO 63130.

E-mail address: enochazasu@wustl.edu (E.K. Azasu).

In Ghana, the World Health Organization (WHO) estimates about 9% of the population to be having some form of mental health issues, which are largely behavioral health related, especially among the youth. Ghana has limited capacity in infrastructure, workforce, resources required to assess, identify, and treat mental health disorders; thus, a large percentage of the mentally ill population do not receive any formal diagnosis or treatment. Despite the passage of the Mental Health Act in 2012 to address these gaps, treatment options available are mostly psychiatric, and gains are yet to be made to ensure behavioral

health treatment is available and accessible throughout the country.

Suicide is a global issue and affects low- and middle-income countries more [1]. Suicide among younger ages particularly adolescents is also becoming a public health concern in many countries [2]. Ghana is faced with high prevalence of suicidal behaviors among high school students with 18.2%, 22.5%, and 22.2% for suicidal ideation, suicidal plan, and suicidal attempt, respectively [3]. The most common means of suicide among this age group is hanging [4]. A study found the risk factors for suicide among this age group to include bullying, physical attack, physical fight, and food insecurity [3] whereas another found a relationship between elements in the adolescents' home and school environment and suicide attempt among high school students in Ghana [4].

Despite the magnitude of the problem, we have little information about the epidemiology of suicide among middle school students including the years preceding high school, as prior studies are focused on the high school age group. This obscures potentially useful information about the age-related changes in suicide risk from the middle school to high school level. A study in South Africa has shown suicide risk manifests way earlier in children aged <15 years who are middle school students [5]. In the United States, Bridge et al. [6] found increasing trends in suicide among children aged 5–11 years from 1.18 to 1.28 per million between 1993–1997 and 1998–2002. These studies points to a gap in research, which can inform targeted clinical interventions and an underserved segment of the population. Suicide risk among younger children is something clinicians need to be aware of to ask the right questions of these children.

The goal of suicide prevention has always been early detection and intervention. It is therefore important to study suicide behaviors as early as middle school years to ensure there is early detection and subsequent intervention. This article explores the characteristics and recent patterns of suicide among Ghanaian middle and high school students using the WHO Global School-based Student Health Survey (GSHS, 2012) [7]. The findings from this study will lay the foundation for understanding the prevalence and risk factors of suicide behaviors among Ghanaian adolescents from middle school to high school between the ages of 11 and 19 years. The findings will be crucial to early identification of students at risk, particularly those that are highly impulsive (no ideation but a history of attempted suicide). These findings will also inform suicide prevention and treatment approaches in the population.

Methodology

Instrument

The data used for the study were the Global School-based Student Health Survey (GSHS, 2012) [7] for middle and high school levels. The GSHS is a collaborative surveillance project conducted through the partnership of the WHO, Disease Control and Prevention, Middle Tennessee State University, and the Ghana Education Service. The study is a cross-sectional survey designed to help countries measure and assess the behavioral risk factors and protective factors related to the leading cause of morbidity and mortality. The test is for young people aged 13–17 years, and it is self-administered. The areas covered in the questionnaire are alcohol use, dietary behaviors, drug use, hygiene, mental health, physical activity, protective factors, sexual

behaviors, tobacco use, violence, and unintentional injury. Participants for the 2012 study were sampled from selected middle and senior high schools in all the 10 regions of Ghana in two stages of cluster sampling. The first stage was based on a probability proportional to the school enrollment to give equal chance for each student. The Ghana Education Service's policy on the use of students in survey required official written permission as well as informed consent from students and parents.

Measures

Suicide behavior as defined in this study are suicide ideation, suicide plan, and suicide attempt. They were the dependent variables for the study and measured nominally with yes or no. For suicide ideation participants were asked, "During the past 12 months, did you ever seriously consider attempting suicide?" For suicide plan, participants were asked, "During the past 12 months, did you make a plan about how you would attempt suicide?" For suicide attempt, participants were asked "During the past 12 months, how many times did you actually attempt suicide?" For attempts those who answered zero times were recoded as "No," whereas those who answered "1 or more times" were recoded as "Yes."

The independent variables, which are risk factors, include hunger, loneliness, worry, bullying, physical attack, sexual intercourse, and substance use. The independent variables, which are protective factors, include number of close friends, parental involvement, parental understanding, parental guidance, and parental privacy. Age, gender, and school level are demographic variables although age and gender moderate the relationships. The data were downloaded from the WHO Web site in SPSS format (please see [Appendix](#) for table detailing the recoding of variables).

Statistical analysis

The analysis was performed using IBM Statistical Package for the Social Sciences version 25 [8] at the 0.05 level of significance. A descriptive of variables was performed followed by a bivariate correlation of the independent variables with suicide ideation, plan, and attempt. This was followed by a multivariate logistic regression of all variables on suicide ideation, plan, and attempt. The level of significance used for the analysis were *p* values of .05, 0.01, and 0.03, which were adjusted with the Bonferroni's [9] correction for the number of variables in the model.

Results

As seen in [Table 1](#), the total number of respondents was 3,632 made up of 45.3% middle school students and 54.3% high school students with 53.2% of the sample being male.

The study found prevalence of suicidal behaviors among the population as follows: ideation (19%), plan (22%), and attempt (25%).

The prevalence of suicide among middle school students was 20.4% for suicide ideation, 23.4% for suicide plan, and 28.4% for suicide attempt. Among high school students, the prevalence of suicide behaviors was 18.1% for suicide ideation, 22.4% for suicide plan, and 22.3% for suicide attempts.

The analysis further revealed that suicide attempts was significantly higher among middle school students than high school students (28.4% > 22.3%; $\chi^2 = 17.1$, $p < .001$).

Table 1
Demographics and associations between suicide behaviors and independent variables

	N (%)	Ideation		Plan		Attempt	
		n (%)	χ^2	n (%)	χ^2	n (%)	χ^2
	3,632 (100)	688 (18.9)		810 (22.3)		899 (24.8)	
Ideation				396 (60.0)	642.9**	456 (67.0)	814.3**
Plan						510 (63.6)	899.3**
Middle school	1,645 (45.3)	328 (20.4)	2.9	370 (23.4)	0.43	459 (28.4)	17.1**
High school	1,972 (54.3)	356 (18.1)		435 (22.4)		437 (22.3)	
Age <12 years	209 (5.8)	33 (16.4)	2.69	33 (16.5)	10.7	46 (22.5)	7.43
13 years	278 (7.7)	49 (17.9)		58 (21.4)		70 (25.4)	
14 years	395 (10.9)	72 (18.6)		77 (20.3)		101 (26.0)	
15 years	498 (13.7)	89 (18.1)		109 (22.4)		123 (24.9)	
16 years	440 (12.1)	90 (20.7)		111 (26.0)		122 (28.2)	
17 years	611 (16.8)	118 (19.5)		151 (21.3)		164 (27.2)	
<18 years	1,182 (32.5)	232 (19.8)		267 (23.1)		269 (22.9)	
Male	1,932 (53.2)	324 (17.0)	11.5**	391 (20.7)	10.02**	460 (23.9)	2.61
Female	1,662 (45.8)	353 (21.5)		408 (25.2)		430 (26.3)	
Hunger	2,119 (58.3)	448 (21.4)	17.1**	537 (26.1)	29.8**	604 (28.9)	43.1**
Loneliness	2,295 (63.2)	447 (19.6)	0.90	550 (24.6)	10.8**	593 (26.1)	4.95
Worried	2,063 (56.8)	473 (23.2)	50.8**	544 (27.1)	46.1**	613 (30.0)	62.0**
1+ close friend	3,127 (86.1)	571 (18.4)	4.57	664 (21.7)	13.1**	739 (23.8)	12.5**
Bullying	1,711 (47.1)	403 (24.0)	66.1**	456 (27.7)	57.8**	568 (33.7)	153.6**
Physical Attack	1,528 (42.1)	372 (24.9)	54.3**	432 (29.4)	59.0**	552 (36.7)	189.9**
Sexual intercourse	1,117 (30.8)	245 (22.1)	30.4**	275 (25.3)	23.1**	302 (27.3)	46.2**
Substance use	515 (14.2)	147 (29.2)	51.1**	167 (34.9)	57.4**	213 (42.2)	132.7**
Parental involvement	2,322 (63.9)	399 (19.1)	12.2**	291 (19.3)	2.40	572 (24.9)	0.001
Parental understanding	2,513 (69.2)	437 (17.6)	13.01**	535 (21.9)	4.00	588 (23.7)	7.21*
Parental guidance	2,385 (65.7)	419 (17.7)	7.3*	501 (21.5)	4.74	557 (23.6)	5.86*
Parental privacy	1,526 (42.0)	291 (19.3)	0.11	347 (23.4)	0.43	414 (27.5)	9.05*

* $p < .01$; ** $p < .001$.
% Row percent.

Also, we found that the rate at which students go from ideation to plan (18%; $\chi^2 = 0.43$; $p < .001$), ideation to attempt (31%; $\chi^2 = 0.48$; $p < .001$), and plan to attempt (11%; $\chi^2 = 0.51$; $p < .001$) were statistically significant.

As seen in Table 1, suicide ideation was significantly correlated with gender, hunger, worry, bullying, physical attack, sexual intercourse, and substance use. For suicide plan, we found significant correlations with gender, hunger, loneliness, worry,

bullying, physical attack, sexual intercourse, and substance use. For suicide attempts, we found significant associations with hunger, loneliness, worry, bullying, physical attack, sexual intercourse, and substance use.

As shown in Table 2, level of education increased the odds of suicide ideation, plan, and attempt, but it was not significant after adjusting for other risk factors. In addition, suicide ideation significantly increased the risk for suicide plan (odds ratio [OR] =

Table 2
Multivariate logistic regression results for all variables on suicide behaviors

	Ideation	Plan	Attempt
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Ideation		9.14 (7.57–11.02)*	6.46 (5.20–8.02)*
Plan			7.96 (6.50–9.74)*
Age groups	1.02 (0.94–1.12)	1.04 (0.96–1.12)	0.98 (0.91–1.06)
Gender, Male	1.53 (1.21–1.95)*	1.30 (1.04–1.62)	1.17 (0.93–1.47)
Level, Middle school	1.03 (0.74–1.44)	1.16 (0.85–1.58)	0.95 (0.69–1.30)
Hunger	1.17 (0.91–1.51)	1.35 (1.07–1.71)	1.44 (1.13–1.83)
Loneliness	0.88 (0.67–1.16)	1.01 (0.78–1.31)	0.91 (0.70–1.18)
Worried	2.45 (1.84–3.26)*	1.93 (1.50–2.49)*	1.98 (1.52–2.57)*
Close friends	0.74 (0.53–1.05)	0.58 (0.43–0.80)*	0.54 (0.39–0.74)*
Bullying	1.58 (1.23–2.03)*	1.43 (1.13–1.80)	1.56 (1.23–1.98)*
Attack	1.45 (1.13–1.85)*	1.53 (1.22–1.93)*	2.01 (1.59–2.53)*
Sexual intercourse	1.33 (1.03–1.72)	1.20 (0.95–1.52)	1.60 (1.26–2.03)*
Substance use	1.17 (0.85–1.62)	1.52 (1.13–2.04)	1.50 (1.12–2.02)
Parental involvement	0.96 (0.72–1.28)	0.97 (0.75–1.26)	1.10 (0.84–1.45)
Parental understanding	0.77 (0.57–1.04)	0.77 (0.59–1.02)	0.76 (0.58–1.01)
Parental guidance	0.94 (0.69–1.27)	1.10 (0.83–1.46)	0.96 (0.71–1.28)
Parental privacy	1.08 (0.84–1.39)	0.95 (0.75–1.21)	1.08 (0.85–1.38)

AOR = adjusted odds ratio; CI = confidence interval.
* $p < .001$.

9.14; 95% confidence interval [CI] = 7.57–11.02) and attempt (OR = 11.89; 95% CI = 9.82–14.38), whereas suicide plan significantly increased the odds of suicide attempt (OR = 12.64; 95% CI = 10.50–15.19). Also males were more likely than females to have suicide ideations (adjusted odds ratio [AOR] = 1.53; 95% CI = 1.21–1.95) after adjusting for other factors. Being worried (AOR = 2.45; 95% CI = 1.84–3.26), bullied (AOR = 1.58; 95% CI = 1.23–2.03), and physical attack (AOR = 1.45; 95% CI = 1.13–1.85) significantly increased the odds for suicide ideation. We also found being worried (AOR = 1.93; 95% CI = 1.50–2.49) and physical attack (AOR = 1.53; 95% CI = 1.22–1.93) as significantly increasing the odds of making a suicide plan after adjusting for other factors. Also being worried (AOR = 1.98; 95% CI = 1.52–2.57), bullying (AOR = 1.56; 95% CI = 1.23–1.98), physical attack (AOR = 2.01; 95% CI = 1.59–2.53), and having had sexual intercourse (AOR = 1.60; 95% CI = 1.26–2.03) increased the odds of suicide attempts after adjusting for other factors.

As seen in Table 2, the number of close friends significantly reduced the odds of suicide plan (AOR = 0.58; 95% CI = 0.43–0.80) and attempt (AOR = 0.54; 95% CI = 0.39–0.74) after adjusting for other factors. Also, parental involvement, parental understanding, and parental guidance significantly reduced the likelihood of suicide ideation, plan, and attempt; however, the effects diminished after adjusting for other factors.

Discussion

Using the Global School-based Student Health Survey (GSHS, 2012) [7], we found a higher prevalence of suicide ideation, plan, and attempts among middle students than high school students in Ghana, suggesting an early onset of suicide behaviors. Our findings suggest a need for research on suicidal behaviors among middle school students and younger years in Ghana despite the continued focus on high school and adult populations.

Implications

The first key finding of this study showing higher proportion of suicide ideation, plan, and attempt among middle school students is crucial to understanding the onset of suicide behavior in Ghana. If more people are engaging in suicide behaviors in the middle school years, then there is a hidden crisis of suicide among children with the age of onset unknown to us. These rates are alarming and requires urgent action. Also, the rate at which students transition from ideation to plan and from plan to attempt was also significant. This suggests impulsive suicide behaviors occurring even as early as middle school, and a study has shown that impulsivity differentially increased risk for suicide ideation and attempts [10]. Our findings ask a very important question on the causes of increased rates of suicide among children as early as middle school. What are the experiences of middle school students that cause them to have proportionally higher rates of suicide behaviors than high school students even having significantly more attempts? How do these children encounter these risk factors for suicide and at what age? Questions can also be raised about the resources available to these young children if there are, to deal with these causal factors including their willingness to access them.

Suicide risk factors. Although the odds of suicide were higher among middle school students than high school students, this was not significant after adjusting for other risk factors.

Nevertheless, there is still a need to investigate these high suicide rates among middle school students including preteen years.

The study also found that when it comes to suicide ideation, males are at more risk, but with suicide plan and attempt, there is not a significant difference in the risk, and this has been supported by studies in Ghana [11,12]. Girls are therefore thinking about suicide less but engaging in suicide behaviors more. We need to ask questions on gender norms, which puts pressure on adolescent girls, increases stress, increases abuse, female violence, as well as the culture of silence.

The study also found being worried (anxiety) as significant on suicide plan and attempt. Worry and anxiety is a critical feature of adolescence, and in this study, approximately 57% experience worry (anxiety). There is a lot to deal with during the second decades of life, and it can be overwhelming, and studies have found significant associations between rumination, brooding, and suicide attempts [13]. School work, relationships, identity, body image, future, and time management are some things adolescents worry about. These worries are normal, and to some extent, adolescents need to think about these things and make choices on a daily basis. Hence, worry not being significant on ideations. There should therefore be channels for adolescents to express these worries especially when they become overwhelming, and this can start to lead to suicide behaviors. Suicide behaviors can be used as a means of escape from these worries, anxieties, and the decisions that come with it. It is therefore not surprising that from our findings, sexual activity increases the likelihood of suicide attempts. Obviously sexual activity is another major thing that adolescents have to worry about. It is a critical stage where they need to make sexual choices, and 31% are sexually active. Having sexual intercourse has more risks for adolescents, which include diseases, risk of abuse, sexual identity, and orientation issues among others. Sex education is therefore a critical component if we want to reduce suicide attempts among the population. Adolescents need access to safe sex counseling and tools that can reduce the risks that comes with being sexually active.

The study found bullying as significant on ideation and attempt after controlling for other factors. More than 47% of respondents experienced various types of bullying including physical (11%), ethnic (6%), religion (4%), body shaming (4%), and sexual (3%). This clearly suggests that bullying is predominant among the population as studies have suggested [13]. It is difficult to pinpoint the cause, but we can project the adverse effects of bullying on these children. In a related finding of this study, physical attack with a prevalence of 42% was significant on ideation and attempt further echoing this problem. The second decades of life comes with its own challenges; therefore, physical violence and bullying should not be another problem that adolescents have to deal with in schools.

Suicide protective factors. The number of close friends was shown to significantly reduce the odds of suicide plan and attempt. Approximately 86% of respondents have one or more close friends, which is encouraging that these students have someone they can talk to, which explains why loneliness was not significant on any of the suicide behaviors. Adolescents do talk to and learn from each other and form support networks among themselves. This finding provides an opportunity for a peer-to-peer suicide prevention intervention as a means to reduce suicide in the population. The rationale here is that these children spend more time with their peers and are more likely to share

their problems with them. This is an area that future studies can explore.

Parental guidance and understanding were also significant on reducing suicide ideation, plan, and attempt, but the effect diminished after adjusting for other factors. This suggests that parents can have some role to play in reducing suicide behaviors among their children. This finding however suggests the limitations on parents as the adolescent encounters several other challenges, which they do not rely on their parents for answers. This therefore opens an opportunity for the use of family-based suicide prevention interventions. Of reducing suicide behaviors among adolescents, there should be more emphasis on their peers because they spend more time at school and trust their close friends more.

Limitations

There are many limitations to this study. Most important is that the Global School-based Student Health Survey data (GSHS, 2012) is cross-sectional. Therefore, we cannot determine the causes and directions of associations found. In addition, the sample for the survey was school going–aged Ghanaians; thus, the results cannot be generalized to all children and adolescents in the country. Also, the data were collected using self-report information over the past 12 months for some variables at most, and the only year for which data were available was in 2012. This makes it theoretically challenging to compare variables that do not measure states over the same period. There is still limited information on what causes the onset of suicide behavior among the population. The study does not capture the full range of risk factors of suicide among the population. There could be very important factors such as social media usage, psychological distress, mental health conditions, attitudes toward suicide, stigma, which may influence the onset and causes of suicide behaviors.

Future studies might be interested in identifying all the full range of risk factors for suicide among the population and even for preteen years over a period including the age onset of suicide behaviors. They can also investigate traditional and spiritual beliefs of suicide as it applies to suicide risk, as it may be helpful to understand the contextual risk factors of suicide. Finally, it will be important to understand the methods of suicide as well as the rate of injury and hospitalizations resulting from suicide attempts.

Conclusion

The higher prevalence of suicide ideation, plan, and attempts among middle students than high school students in Ghana is a

cause for concern, suggesting an early onset of suicide behaviors. Studying the patterns in suicide behaviors before the preteen years and among teenagers helps us to know the onset of suicide and where to focus prevention efforts. For public health reasons, there should be continuous surveillance to monitor these new patterns and rigorous research to capture risk, protective, and precipitating factors of suicide among this age group. This will help in early detection and to design age-relevant suicide prevention interventions.

Funding Sources

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Supplementary Data

Supplementary data related to this article can be found at <http://doi.org/10.1016/j.jadohealth.2022.09.036>.

References

- [1] World Health Organization (WHO). Suicide data. Available at: https://www.who.int/mental_health/prevention/suicide/suicideprevent/en/. 2021. Accessed August 1, 2020.
- [2] Wasserman D, Cheng Q, Jiang G, et al. Global suicide rates among young people aged 15–19. *World Psychiatry* 2005;4:114–20.
- [3] Asante K, Kugbey N, Osafo J, et al. The prevalence and correlates of suicidal behaviours (ideation, plan and attempt) among adolescents in senior high schools in Ghana. *SSM Popul Health* 2017;3:427–34.
- [4] Quarshie E, Osafo J, Akotia C, Peprah J. Adolescent suicide in Ghana: A content analysis of media reports. *Int J Qual Stud Health Well Being* 2015; 10:27682.
- [5] Meel BL. Suicide among teenagers and young adults in the Transkei. Case reports. *J Forensic Med Toxicol* 2004;5(2).
- [6] Bridge J, Asti L, Horowitz L, et al. Suicide trends among elementary school-aged children in the United States from 1993 to 2012. *JAMA Pediatr* 2015; 169:673–7.
- [7] World Health Organization (WHO). Global school-based student health survey (GSHS); 2014. Available at: <http://www.who.int/chp/gshs/en/4>. Accessed August 1, 2020.
- [8] IBM Corp. IBM SPSS statistics for windows, version 25.0. Armonk, NY: IBM Corp; 2017.
- [9] Armstrong RA. When to use the Bonferroni correction. *Ophthalmic Physiol Opt* 2014;34:502–8.
- [10] Auerbach RP, Stewart JG, Johnson SL. Impulsivity and suicidality in adolescent inpatients. *J Abnormal Child Psychol* 2017;45:91–103.
- [11] Akotia CS, Kinyanda E, Osafo J. Reasons for attempting suicide: An exploratory study in Ghana. *Transcult Psychiatry* 2019;56:233–49.
- [12] Adinkrah M. Epidemiologic characteristics of suicidal behavior in contemporary Ghana. *Crisis* 2011;32:31–6.
- [13] Rogers ML, Joiner TE. Rumination, suicidal ideation, and suicide attempts: A meta-analytic review. *Rev Gen Psychol* 2017;21:132–42.