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Prevalence of suicide ideation and its associated risk factors among undergraduate students of the university for development studies, Tamale

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Abstract

Background Suicide and its associated risk factors are of public health importance across the globe. The affected persons are mostly the youth. Empirical research in this crucial area of public health is generally lacking, especially among undergraduate university students in Ghana. This study sought to determine the prevalence of suicide ideation, and its associated risk factors that statistically predict suicide ideation among undergraduate students. Methods: A descriptive cross-sectional quantitative survey was conducted. A structured online questionnaire was used to elicit information on the prevalence of suicide ideation and its correlates. A systematic sampling technique was used to sample 400 respondents. Of this number, 53.25% were male and 46.75% were female. Data were analyzed using SPSS v26. Results were presented in charts, tables, and cross-tabulations. A regression analysis was also done to model suicide ideation with socio-demographic variables. Results: The prevalence of suicide ideation among participants was 24.5%. Significant risk factors for suicide ideation found in the study were academic stress and victimization. Suicide ideation was predicted with statistical significance by the presence of victimization (OR = 3), and academic stress (OR = 2). Conclusion: The prevalence of suicide ideation among participants is real and will need combined efforts of university management and, the counseling unit to put in place interventions that will help avert suicide ideation and its dreaded squeal of completed suicide.

Keywords Suicide, Prevalence, Ideation, Undergraduate, Risk factors

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Background

Suicide is a public health concern of global importance given its devastating effects on populations [1]. A study by McHugh et al. [2] revealed that the sensitivity for suicide was 40%, with a range from 0 to 97%, a first quantile of 25%, a median of 44%, and a third quantile of 67%. It has been reported that suicide is among the leading cause of death among adolescents and young people [3], and the second most common cause of death among persons aged 15–29 years. It also accounts for nearly 800, 000 deaths annually [4, 5], and approximately 115 people are affected with one completed suicide, with one in five reporting an experience of a major life disruption [6].

Globally, about 3.8 per 100,000 suicide-related deaths occur among age group 10–19 every year [7]. The available literature on suicide suggests that aside from the point of planning to the point of attempting suicide, suicide ideation is also associated with persons who have a history of suicide ideation. Approximately one-third of youth with suicide ideation go on to develop a suicide plan during adolescence, approximately 60% of those with a plan make a suicide attempt and most of those who make this transition do so within the first year after onset [8, 9].

Although a global problem, the rate of suicide continues to increase in low and middle-income economies such as Africa [10]. The subgroup most affected within the vulnerable population is university students [3]. Undergraduate students at tertiary institutions face significant levels of stress in the form of academic workloads, poverty, peer pressure, and separation from family [11–14].

The prevalence of lifetime suicide ideation among college students worldwide was 22.3% according to Mortier et al. [3], which appears to be greater than the estimates in a study by Borges et al. [15], and other population estimates [8, 16]. The lifetime aggregate prevalence of suicide ideation among adolescents was found to be 18% globally [17]. In Africa, the prevalence of suicide ideation among adolescents was found to be 21% [18]. The lifetime prevalence of suicide behaviours among young persons in Ghana was 18.2%, 22.5%, and 22.2% for suicide ideation, suicidal plan, and suicidal attempt respectively [19].

Data on prevalence and suicide-related risk factors, particularly in Ghana, are generally limited [20]. There are several anecdotal reports of suicide among university students in Ghana [21–23]. Some of the reports include: in January 2019, a final year student in the Wa Campus of the University for Development Studies died by suicide over poor grades [24]. Again, a news report of a third-year medical student of the University of Ghana who also completed suicide after posting several items indicative of suicidal ideation on social media (Now I put the phone down to do some actual studying; Some days I feel like a King; other days I wish for death, need a new life, this one is broken, sometimes I feel like I'm fading away). This started after he had failed courses and was billed to repeat [22]. The list of similar unfortunate events such as these is increasing [5]. There is a prevalence of 15.4% for suicidal ideation, 6.6% for plans, and 2.3% for attempted suicides among students in the Korle Bu, Nurses and Midwifery Training College [25].

It is estimated that about 1500 suicide cases are reported annually in Ghana, and in each suicide reported, there are about four unreported cases, as was reported in Daily Graphic in 2015 [5]. This study sought to determine the prevalence of suicide ideation and its associated risk factors among undergraduate students at the University for Development Studies.

Objectives

The main objective was to determine the prevalence of suicide ideation and its associated risk factors among undergraduate students at UDS Tamale Campus.

The specific objectives were:

1. To identify socio-demographic factors that constitute a significant risk for suicide ideation among undergraduate students of UDS Tamale-Campus.
2. To predict suicide ideation with significance based on the socio-demographic characteristics among undergraduate students of UDS Tamale- Campus.

Methodology

Study design and setting

A quantitative study was carried out to measure the level of suicidal ideation using a descriptive cross-sectional study design to assess the prevalence of suicidal ideation and the associated socio-demographic risk factors.

The study was conducted in the Tamale campus of the University for Development Studies. The university is between Latitude: 9° 24', 2.84" N, Longitude: 0° 50', 21.48" E in Tamale, the Northern region of Ghana. It was established in May 1992 by the Government of Ghana (PNDC Law 279) to mix academic work with that of the community to provide a constructive relationship between the two for the overall development of Northern Ghana, in particular, and the country as a whole [26]. The University started academic work in September 1993 with the admission of forty (40) students into the Faculty of Agriculture (FoA), Nyankpala, and currently has a student population of 19,720 [26]. The University was chosen because some university students had died by suicide, and different opinions were proffered to explain the situation. University for Development Studies was chosen because it was the only university in northern Ghana.

Study population

The study population consists of all undergraduate students of the University for Development Studies in the Tamale Campus.

Sampling size, method, and technique

The sample size was determined using Yamane's formula [27]. In this formula, the sample size is 375 participants for a finite population of 6183. However, to account for incomplete forms and forms with missing responses, 10% of 375 was added which resulted in a sample size of 412 students for the study.

A systematic sampling technique was used to select participants based on the class registers. The researchers obtained the class list containing the names of all students. The total population of the students was divided by the sample size to get the sample interval. The proportion of students required to make a representative sample was calculated for each class based on each class size. Using the sampling interval, participants were then systematically selected from the class list (the sampling frame). The participants were informed about the study through their WhatsApp platforms. A link to the questionnaire was shared with them via 'WhatsApp'. Participants who did not respond were given a gentle reminder through phone calls until they all responded.

Table 1 Socio-demographic characteristics

Characteristics	Frequency	Percentage (%)
Age		
18–24	341	85.3
25–30	59	14.8
Total	400	100
Gender		
Male	213	53.25
Female	187	46.75
Total	400	100
Marital status		
Single	373	93.5
Married	10	2.5
Others	16	4.0
Total	400	100
Religion		
Christianity	248	62.0
Islam	147	36.8
Traditional	0	0
Others	5	1.3
Total	400	100
Programme		
Medicine	157	39.3
Biomedical Lab Science	81	20.3
Pharmacy	23	5.3
Community Nutrition	69	17.3
Education Studies	29	7.2
Nursing	19	4.8
Midwifery	22	5.5
Total	400	100

Data collection technique and tools

The data collection technique was a survey carried out to collect the data. The deployed tools were an online questionnaire, created with Google Forms. The questionnaire contained measures described below.

Measures

A suicide ideation questionnaire [28] was adapted to reveal the socio-demographic context of the study population as per the objectives of the study. The questionnaire contained two parts. The first part measured socio-demographic characteristics and university-related risk factors (victimization/bullying and academic stress). The second part measured suicide ideation.

Data analysis

The data were coded and analyzed using Statistical Package for Social Science (SPSS version 26). The results were presented in frequency tables, bar graphs, pie charts, and cross-tabulation of explanatory variables with suicide behaviour. Binary logistic regression analysis was used to determine how well the explanatory variables (risk factors) predicted the dependent variable (suicide ideation). For a binary logistic regression model, the antilog for every coefficient of each independent variable (B) represents a unit change in the odds of having suicide ideation, the null hypothesis in logistic regression, therefore, states that the odds of having suicide ideation is 1 for all the independent variables.

Results

Socio-demographic characteristics

A total of 416 participants responded to the online survey, however, 400 of the most complete forms were selected for the data analysis. Responses that were excluded from analyses included; missing responses on Age and Gender ($n=12$); did not respond to a program of study ($n=1$); and missing information on lifetime suicide ideation ($n=3$). The majority of the participants were between the ages of 18 and 24 (Table 1). Again, the majority were male and single with very few married participants. Additionally, most of them were Christians, followed by Moslems. Regarding the program of study, most of the participants were medical students, followed by biomedical science students and the least were nursing students.

Lifetime suicide ideation

Regarding lifetime suicide ideation (Fig. 1) among undergraduate students of the University for Development

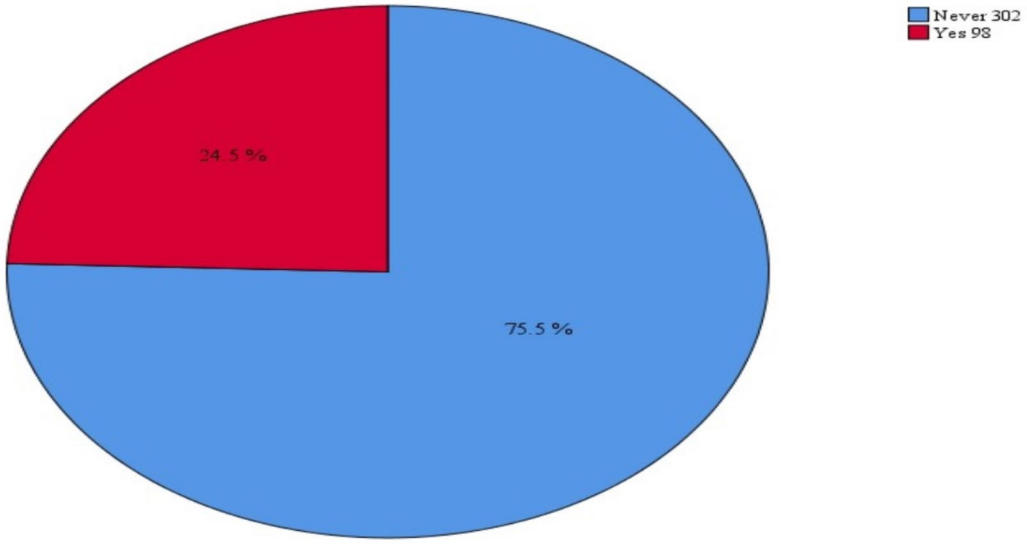

Fig. 1 Lifetime suicide ideation

Table 2 Cross-tabulation of religion and suicide ideation

Pearson's Chi-square for religion Value 7.397, df-2, sig. 0.25 Cut-off – 0.05			Suicide Ideation		Total
			Yes	Never	
Religion	Christianity	Frequency	71	177	248
		% within Religion	28.6%	71.4%	100.0%
		% within Suicide Ideation	72.4%	58.6%	62.0%
	Islam	Frequency	25	122	147
		% within Religion	17.0%	83.0%	100.0%
		% within Suicide Ideation	25.5%	40.4%	36.8%
	other	Frequency	2	3	5
		% within Religion	40.0%	60.0%	100.0%
		% within Suicide Ideation	2.0%	1.0%	1.3%

Studies, 98(24.5%), had thoughts about completing suicide at some point in their lives.

Gender, living arrangement, and lifetime suicide ideation

The majority of the respondents were male (53.3%), while the majority of respondents reporting suicide ideation were females (56.1%). In the case of respondents' living arrangements and the prevalence of suicide ideation. This was to determine if respondents lived alone in their dormitories or if they lived with other students. The majority (75%) of the respondents lived with others and thus, the majority (72.4%) of those with suicide ideation also lived with others.

Religion and suicide ideation

Nearly half of students who profess 'other' religions have suicide ideation. However, among students with suicide ideation, more Christian students had suicide ideation (Table 2).

Victimization/bullying and lifetime suicide ideation

Participants who reported being victimized or bullied physically reported more suicide ideation, students who reported being victimized or bullied verbally came next, then students being victimized or bullied sexually, and the least were students who did not report any victimization or bullying (Table 3).

Academic stress and suicide ideation

Most participants (258) report being satisfied with their academic situation and are not stressed academically. The majority of students reporting academic stress (142) are failing to meet personal academic goals (80). Very few students have failed courses (5) and only one has been suspended academically. Students struggling to keep up with courses have the highest suicide ideation (42.9%) while students who are satisfied with their academic situation have the lowest suicide ideation (19.0%) (Table 4).

Table 3 Victimization and prevalence of lifetime suicide ideation

Chi-square value = 33.567 df = 4 p = 0.00 cutoff-0.05				Suicide Ideation		Total
				Yes	Never	
Victimization	No		Frequency	55	245	300
			% within no victimization	18.3%	81.6%	100.0%
			% within Suicide Ideation	56.1%	81.1%	75%
	Yes	Verbally	Frequency	35	49	84
			% within victimized verbally	41.6%	58.3%	100.0%
			% within Suicide Ideation	35.7%	16.2%	21.0%
		Physically	Frequency	7	5	12
			% within victimized physically	58.3%	41.7%	100.0%
			% within Suicide Ideation	7.1%	1.6%	3.0%
		Sexually	Frequency	1	3	4
			% within victimized sexually	25.0%	75.0%	100.0%
			% within Suicide Ideation	1.0%	1.0%	1.0%
Total				98	302	400

Table 4 Academic stress and suicide ideation

Academic stress	Satisfactory	Chi-Square Value = 16.581 df = 5 p = 0.005 cut-off = 0.05	Suicide ideation		Total
None			Yes	Never	
		Frequency	**49**	**209**	**258**
		% within satisfactory	**19.0%**	**81.0%**	**100%**
		% within Suicide ideation	**50%**	**69.2%**	**64.5%**
Yes	Failing courses	Frequency	2	3	5
		% within failing courses	40%	60%	100%
		% within suicide ideation	2%	1%	1.3%
	Academic Suspension	Frequency	0	1	1
		% within the academic suspension	0%	100%	100%
		% within suicide ideation	0%	0.3%	0.3%
	Struggling to keep up with courses	Frequency	24	32	56
		% within struggling to keep up with courses	42.9%	56.1%	100%
		% within suicide ideation	24.5%	10.6%	14%
	Failingto meet personal goals	Frequency	23	57	80
		% within failing to meet personal goals	29%	71%	100%
		% within suicide ideation	23.5%	18.9%	20%
Total			98	302	400

Table 5 Binary logistic regression for suicide ideation

Variable	Intercept(B)	Standard Error	Chi-square	Degree of Freedom	P-value (significance)	Exp (B) odds ratio	95% Confidence Interval
Victimization (Yes)	1.14	0.29	15.53	1	0.00	3.12	1.77–5.50
Academic stress (Yes)	0.74	0.28	6.87	1	0.01	2.10	1.25–3.64
Mental disorder (Yes)	2.42	1.15	4.45	1	0.04	11.22	1.19-106.10
Constant	-2.23	0.38	34.75	1	0.00	0.11	

Binary logistic regression of statistically significant independent variables

Table 5 displays the results of statistically significant predictor variables that are included in the regression equation of suicide ideation in this study. Intercept (B) are the values for the binary logistic regression equation for predicting suicide ideation from the independent variable. S.E. is the standard error associated with the coefficients of the independent variables. The Chi-square and Significance columns provide the Chi-square value and 2-tailed p-value used in testing the null hypothesis that the coefficient (parameter) is 1. Coefficients having p-values less than alpha (set at 0.05) are statistically significant. The Df column lists the degrees of freedom for each of the tests of the coefficients. Values in column Exp (B) are the odds ratios for the predictors. They are the exponentiation of the coefficients. Mental health disorders have the highest odds of predicting suicide ideation in the study.

Discussion

Socio-demographic correlates

The ages of the respondents in the study ranged between 18 and 30 years. There was no significant difference ($p=0.257$) in the lifetime prevalence of suicide ideation based on the age groups (19–24, 25–30). Again, of the 98 participants reporting suicide ideation, more than half of them were females (56.1%). Furthermore, being female attributes a 29.6% chance of having suicidal ideation while being a male conferred a 20.2% chance of having suicidal ideation. This ties in well with studies involving undergraduate students [29–31] where the prevalence of lifetime suicide ideation was higher amongst female participants. The same applies to studies by [32, 33, 31], where a higher suicide ideation rate was found among females as compared to their male contemporaries. Females have a higher lifetime prevalence of suicide ideation than males contradicting [34] and [35] as they found suicide ideation to be higher in males than female university students in Australia and the United States of America respectively. Again, Van Niekerk et al. [36], did not find any difference in suicide ideation between the genders, and Zhang et al. [37], found the prevalence of suicide ideation to be higher among females. There was no statistical difference in lifetime suicide ideation between male and female undergraduate students ($p=0.08$), and gender did not also significantly predict suicide ideation in the regression analysis. The implication, therefore, is that suicide prevention interventions should target both genders equally as differences do not truly exist between genders.

Predicting suicide ideation with socio-demographic characteristics

From the results, the statistically significant independent variables that also predicted suicide ideation with statistical significance were, victimization (OR=3.121, $p=0.000$, 95% CI; 1.772–5.497), mental health disorder (OR=11. 223, $p=0.035$, 95% CI; 1.187–106.067) and academic stress (OR=2.095, $p=0.009$, 95% CI; 1.205–3.643). This means that the odds of having suicide ideation are 3 times if you have been victimized, 2.1 times if you have academic stress, and 11.2 times if you have a mental disorder.

Lifetime prevalence of suicide ideation

The lifetime prevalence of suicide ideation among students was found to be 24.5%. This prevalence is near the upper limit of the general population prevalence of suicide ideation which ranges between 2.6 and 25.4% globally [38]. The lifetime prevalence of 24.5% is comparable to the worldwide college student's lifetime prevalence of 22.3% [3]. Furthermore, the prevalence was also similar to other studies among undergraduate university students in twelve Moslem countries (22.1%), and Botswana (28.7%) [39, 40] respectively. This prevalence was, however, lower than the lifetime prevalence of 32.7% that was found among university students across 19 colleges in 8 countries in Africa, Europe, and the Americas [41, 42, 36], that measured suicide ideation prevalence rates among undergraduate university students at 32.3% and 31.9% respectively. However, the lifetime prevalence of 24.5% was higher compared to Portuguese undergraduate university students (12.6%) [31], and two other Ghanaian studies [25, 43], that found prevalence rates of 15.7% and 18.2%.

Living arrangement and lifetime prevalence of suicide ideation

Of the 98 students with suicide ideation, the majority 71 (72.4%) lived with others, while 27 (27.6%) lived alone (difference statistically insignificant). Living alone, therefore, did not predict suicide ideation with statistical significance. This finding contradicts the literature reviewed [44–46].

Religion and lifetime prevalence of suicide ideation

Christian students accounted for 62% of respondents while 36.8% were Moslems and the remaining 1.3% did not profess any religion. The disproportionate number of responses does not permit accurate statistical inter-stratum comparison. However, within a stratum, the prevalence of suicide ideation was 40% among students without any religion, 28.6% among Christian students, and 17% among Moslem students. This finding is consistent with the protective role that religion plays in preventing suicide [47, 48]. Religion, however, did not significantly ($p=0.417$) predict suicide ideation. Thus, not being religious did not decrease the odds of having suicidal ideation.

Academic stress and suicide ideation

The prevalence of academic stress was found to be 35.5% in this study. This encompasses students failing in courses, struggling to keep up with courses, failing to meet personal goals, and students with academic suspension. This prevalence is less than the prevalence of 70% reported by [49, 50, 33] in the University of Cape Coast Ghana but higher than the reported prevalence of 18.24% among pharmacy students at the University of Ghana [51]. A majority (64%) of students in the study were satisfied with their academic situation and also had a lower intra-stratum suicide ideation rate (19.0%) compared with the intra-stratum rate of failing courses (40%), failing to meet personal academic goals (29.0%) and struggling to keep up with course work (42.9%). Overall, students with academic stress (failing courses, failing to meet personal academic goals, and struggling to keep up

with coursework) had a suicide ideation prevalence of 50%. The presence of academic stress predicted suicide ideation significantly ($p=0.009$).

Victimization or bullying, and suicide ideation

The prevalence of victimization or bullying by either a peer or lecturer in this study was found to be 25%. More students (84) reported being bullied or victimized verbally and only one student reported being bullied or victimized sexually. The prevalence found in this study is less than the rates in the preceding literature. To put into context, the prevalence of bullying or victimization among college students [52] was 18% and 32% for professors and colleagues respectively. Also, the World Health Organization's Global School-based Student Health Survey (GSHS) in 2007 showed that the prevalence of bullying or victimization in Ghanaian schools was as high as 59%, which is supported by [53, 54] with the prevalence of 40% and 43% respectively among high school students. The prevalence of suicide ideation among students reporting being victimized was 43.9%. The students who reported being bullied physically by a peer were more likely to have suicide ideation (58.3%). Thus, this study adds to the wealth of literature that has found a positive association between suicide ideation and bullying or victimization [55, 56] but contradicts [57] that did not find any link between bullying or victimization and suicide ideation. There are 3 times the odds of having suicide ideation if you have been victimized in this study.

Conclusion

This study sought to measure the lifetime prevalence of suicide ideation and associated socio-demographic characteristics among students of the University for Development Studies, Tamale Campus. The overall lifetime prevalence was 24.5% which is higher than the prevalence from other studies in Ghana. The prevalence of suicide ideation found was statistically associated with university-associated factors like academic stress, and victimization. The study did not find any significant differences between the program of study, level of study, living alone, and suicide ideation. Thus, the study emphasizes the complex interacting pathways of risk factors for causing suicide behaviour. This study thus sets the stage for more studies in this important aspect of public health. Victimization and academic stress significantly predicted suicide ideation.

Abbreviations

Df	Degree of Freedom
FoA	Faculty of Agriculture
GSHS	Global School-based Health Survey
OR	Odds Ration
PNDC	Provisional National Defense Council
SE	Standard Error
SPSS	Statistical Package for Social Sciences
UDS	University for Development Studies

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12888-024-06155-7.

Supplementary Material 1

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Author contributions

The conception of the study and its design was done by L.D.S. and A.Y. The data collection was done by L.D.S. Data analysis and interpretation were done by LDS and AY. The manuscript drafting and interpretation were done by L.D.S. and A.Y. The authors, L.D.S. and A.Y. have all read and approved the final manuscript.

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Data availability

The datasets used during the current study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

The Institutional Ethics Review Board of the University for Development Studies approved the study. All participants provided written informed consent to participate. All participants participated voluntarily throughout the study.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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References

1. WHO. (2019) *Schizophrenia*. https://www.who.int/en/news-room/fact-sheets/detail/schizophrenia
2. McHugh CM, Chun LRS, Hermens DF, Corderoy A, Large M, Hickie IB. Impulsivity in the self-harm and suicidal behavior of young people: a systematic review and meta-analysis. J Psychiatr Res. 2019;116:51–60. Epub 2019 May 17. PMID: 31195164.
3. Mortier P, Cuijpers P, Kiekens G, Auerbach RP, Demyttenaere K, Green JG. (2017). *The prevalence of suicidal thoughts and behaviours among college students: a meta- analysis*. https://doi.org/10.1017/S0033291717002215
4. WHO. (2019b). *Mental disorders Key facts*. https://www.who.int/en/news-room/fact-sheets/detail/mental-disorders
5. Abdulai T. Trends of online news media reported suicides in Ghana (1997–2019). BMC Public Health. 2020;20:35. https://doi.org/10.1186/s12889-020-8149-3.
6. Sandler E. (2018, September 10). Ripple effect of suicide. *National Alliance on Mental Illness*.
7. Glenn CR, Kleiman EM, Kellerman J, Pollak O, Cha CB, Esposito EC, Porter AC, Wyman PA, Boatman AE. Annual research review: a meta-analytic review of worldwide suicide rates in adolescents. J Child Psychol Psychiatry. 2020;61(3):294–308. https://doi.org/10.1111/jcpp.13106.
8. Nock MK, Borges G, Bromet EJ, Alonso J, Angermeyer M, Beautrais A, Bruffaerts R, Wai TC, De Girolamo G, Gluzman S, De Graaf R, Gureje O, Haro JM,

Huang Y, Karam E, Kessler RC, Lepine JP, Levinson D, Medina-Mora ME, Williams D. Cross-national prevalence and risk factors for suicidal ideation, plans, and attempts. Br J Psychiatry. 2008b;192(2):98–105. https://doi.org/10.1192/bjp.bp.107.040113.
9. Nock MK, Green JG, Hwang I, McLaughlin KA, Sampson NA, Zaslavsky AM, Kessler RC. Prevalence, correlates, and treatment of lifetime suicidal behavior among adolescents: results from the National Comorbidity Survey Replication adolescent supplement. JAMA Psychiatry. 2013;70(3):300–10. https://doi.org/10.1001/2013.jamapsychiatry.55. PMID: 23303463; PMCID: PMC3886236.
10. WHO. (2021) Suicide rate estimates, crude estimates by city; Retrieved on 16 March 2022.
11. Mukwevho MH. Time management challenges on students' academic performance: a case study of a rural university in Limpopo Province, South Africa. Afr J Dev Stud. 2018;8(2):81–99. https://doi.org/10.31920/2050-4284/2018/S1n1a12. [CrossRef] [Google Scholar] [Ref list].
12. Alabi AA. (2022) Suicide attempts among students of higher education, Nelson Mandela Bay Municipality, South Africa. *S Afr Fam Pract*, 8;64(1):e1-e7. https://doi.org/10.4102/safp.v64i1.5609. PMID: 36453798; PMCID: PMC9724133.
13. Kaggwa MM, Muwanguzi M, Nduhuura E, Kajjimu J, Arinaitwe I, Kule M, Najjuka SM, Rukundo GZ. Suicide among Ugandan university students: evidence from media reports for 2010–2020. BJPsych Int. 2021;18(3):63–7. https://doi.org/10.1192/bji.2021.13. PMID: 34382950; PMCID: PMC8314982.
14. Kaggwa MM, Najjuka SM, Favina A, Griffiths MD, Mamun MA. Suicidal behaviors and associated factors among medical students in Africa: a systematic review and meta-analysis. J Affect Disorders Rep. 2023;11:100456. https://doi.org/10.1016/j.jadr.2022.100456.
15. Borges G, Bagge CL, Cherpitel CJ, Conner KR, Orozco R, Rossow I. A meta-analysis of acute use of alcohol and the risk of suicide attempt. Psychol Med. 2017;47(5):949–57. Epub 2016 Dec 8. PMID: 27928972; PMCID: PMC5340592.
16. Han B, Compton WM, Blanco C, Colpe L, Huang L, McKeon R. National trends in the prevalence of suicidal ideation and behavior among young adults and receipt of Mental Health Care among suicidal young adults. J Am Acad Child Adolesc Psychiatry. 2018;57(1):20–e272. https://doi.org/10.1016/j.jaac.2017.10.013.
17. Lim KS, Wong CH, McIntyre RS, Wang J, Zhang Z, Tran BX, Tan W, Ho CS, Ho RC. Global lifetime and 12-Month prevalence of suicidal behavior, Deliberate Self-Harm and Non-suicidal Self-Injury in Children and adolescents between 1989 and 2018: a Meta-analysis. Int J Environ Res Public Health. 2019;19(22):4581. https://doi.org/10.3390/ijerph16224581. PMID: 31752375; PMCID: PMC6888476.
18. Biswasa T, Scott JG, Munirg K, Renzahoh AMN, Rawalh LB, Baxtera J, Mamuna AA. (2020) Global variation in the prevalence of suicidal ideation, anxiety and their correlates among adolescents: A population based study of 82 countries, *ELSEVIE*.
19. Oppong-Asante K, Kugbey N, Osafo J, Quarshie ENB, Sarfo JO. The prevalence and correlates of suicidal behaviours (ideation, plan and attempt) among adolescents in senior high schools in Ghana. SSM - Popul Health. 2017a;3(May):427–34. https://doi.org/10.1016/j.ssmph.2017.05.005.
20. Oppong Asante K, Kugbey N, Osafo J, Quarshie ENB, Sarfo JO. The prevalence and correlates of suicidal behaviours (ideation, plan and attempt) among adolescents in senior high schools in Ghana. SSM - Popul Health. 2017b;3:427–34. https://doi.org/10.1016/j.ssmph.2017.05.005.
21. Choicism. (2019). Final year UDS student commits suicide over poor examination results. https://choicism.com/other-campuses/final-year-uds-student-commits-suicide-over-poor-examination-result/
22. Ghanaweb. (2019). Legon medical student 'commits suicide.' https://www.ghanaweb.com/GhanaHomePage/NewsArchive/Legon-medical-student-commits-suicide-778814
23. Myjoyonlne. (2020). SHS student commits suicide after being jilted - *MyJoyOnline.com*. https://www.myjoyonline.com/shs-student-commits-suicide-after-being-jilted/
24. MyNewsGH. (2019). Breaking News: UDS student attempts suicide; June 30. https://www.mynewsgh.com›crime
25. Quarshie ENB, Cheataa-Plange HV, Annor F, Asare-Doku W, Lartey JKS. Prevalence of suicidal behaviour among nursing and midwifery college students in Ghana. Nurs Open. 2019;6(3):897–906. https://doi.org/10.1002/nop2.271.
26. UDS. (2020). About Us – University for Development Studies. https://uds.edu.gh/about-us/
27. Yamane T. Statistics, an introductory analysis. 2nd ed. New York: Harper and Row; 1967.
28. Ghasemi P, Shaghaghi A, Allahverdipour H. Measurement scales of suicidal ideation and attitudes: a systematic review article. Health Promot Perspect. 2015;25(3):156–68. https://doi.org/10.15171/hpp.2015.019. PMID: 26634193; PMCID: PMC4667258.
29. Miranda-Mendizabal A, Castellví P, Alayo I, Vilagut G, Blasco MJ, Torrent A, Ballester L, Almenara J, Lagares C, Roca M, Sesé A, Piqueras JA, Soto-Sanz V, Rodríguez-Marín J, Echeburúa E, Gabilondo A, Cebrià AI, Bruffaerts R, Auerbach RP, Alonso J. Gender commonalities and differences in risk and protective factors of suicidal thoughts and behaviors: a cross-sectional study of Spanish university students. Depress Anxiety. 2019;36(11):1102–14. https://doi.org/10.1002/da.22960.
30. Mortier, P., Auerbach, R.P., Alonso, J., Bantjes, J., Benjet, C., Cuijpers, P., Ebert, D.D., Green, J.G., Hasking, P., Nock, M.K., O'Neill, S., Pinder-Amaker, S., Sampson, N.A., Vilagut, G., Zaslavsky, A. M., Bruffaerts, R., Kessler, R.C., Boyes, M., Kiekens, G., … Vives, M. (2018a). Suicidal Thoughts and Behaviors Among First-Year College Students: Results From the WMH-ICS Project. *Journal of the American Academy of Child and Adolescent Psychiatry*, *57*(4), 263–273.e1. https://doi.org/10.1016/j.jaac.2018.01.018.
31. Pereira A, Cardoso F. Suicidal ideation in university students: prevalence and association with school and gender. Paideia. 2015;25(62):299–306. https://doi.org/10.1590/1982-43272562201503.
32. Assarsson R, Petersen S, Högberg B, Strandh M. Gender inequality and adolescent suicide ideation across Africa, Asia, the South Pacific and Latin America – a cross-sectional study based on the Global School Health Survey (GSHS). Global Health Action. 2019;11(3). https://doi.org/10.1080/16549716.2019.1663619.
33. Osama M, Islam MY, Hussain SA, Masroor SMZ, Burney MU, Masood MA, Menezes RG, Rehman R. Suicidal ideation among medical students of Pakistan: a cross-sectional study. J Forensic Leg Med. 2014;27:65–8. https://doi.org/10.1016/j.jflm.2014.08.006.
34. Hamilton TK, Schweitzer RD. The cost of being perfect: perfectionism and suicide ideation in university students. Aust N Z J Psychiatry. 2000;34(5):829–35. https://doi.org/10.1080/j.1440-1614.2000.00801.x.
35. Mackensie S, Wiegel JR, Mundt M, Brown D, Saewyc E, Heiligenstein E, Harahan B, Fleming M. (2011). *Depression and suicide ideation among students accessing campus health care. - PsycNET*. https://psycnet.apa.org/record/2012-11011-011
36. Van Niekerk L, Scribante L, Raubenheimer PJ. Suicidal ideation and attempt among South African medical students. South Afr Med J = Suid-Afrikaanse Tydskrif Vir Geneeskunde. 2012;102(6):372–3. https://doi.org/10.7196/samj.5503.
37. Zhang YY, Lei YT, Song Y, Lu RR, Duan JL, Prochaska JJ. Gender differences in suicidal ideation and health-risk behaviors among high school students in Beijing, China. J Glob Health. 2019;9(1):010604. https://doi.org/10.7189/jogh.09.010604. PMID: 31217964; PMCID: PMC6571108.
38. Torres AR, Campos LM, Lima MCP, Ramos-Cerqueira ATA. (2018). Suicidal Ideation Among Medical Students: Prevalence and Predictors. The Journal of Nervous and Mental Disease 206(3):p 160–168, March 2018. | https://doi.org/10.1097/NMD.0000000000000734
39. Eskin M, AlBuhairan F, Rezaeian M, Abdel-Khalek AM, Harlak H, El-Nayal M, Asad N, Khan A, Mechri A, Noor IM, Hamdan M, Isayeva U, Khader Y, Sayyari A, Khader A, Behzadi A, Öztürk B, Hendarmin CŞ, Khan LA, M.M., Khatib S. Suicidal thoughts, attempts and motives among University students in 12 Muslim-Majority Countries. Psychiatr Q. 2019;90(1):229–48. https://doi.org/10.1007/s11126-018-9613-4.
40. Korb I, Plattner IE. Suicide ideation and depression in university students in Botswana. J Psychol Afr. 2014a;24(5):420–6. https://doi.org/10.1080/14330237.2014.997010.
41. Mortier, P., Auerbach, R.P., Alonso, J., Axinn, W.G., Cuijpers, P., Ebert, D.D., Green, J.G., Hwang, I., Kessler, R.C., Liu, H., Nock, M.K., Pinder-Amaker, S., Sampson, N. A., Zaslavsky, A.M., Abdulmalik, J., Aguilar-Gaxiola, S., Al-Hamzawi, A., Benjet, C., Demyttenaere, K., … & Bruffaerts, R. (2018). Suicidal thoughts and behaviors among college students and same-aged peers: results from the World Health Organization World Mental Health Surveys. *Social Psychiatry and Psychiatric Epidemiology*, *53*(3). https://doi.org/10.1007/s00127-018-1481-6.
42. Palmier JB. (2011). Prevalence and correlates of suicidal ideation among students in sub- Saharan Africa. Preval Correlates Suicidal Ideation among, 1–55.
43. Oppong-Asante K, Meyer-Weitz A. Prevalence and predictors of suicidal ideations and attempts among homeless children and adolescents in Ghana. J Child Adolesc Mental Health. 2017;29(1):27–37. https://doi.org/10.2989/17280583.2017.1287708.

44. Beutel ME, Klein EM, Brähler E, Reiner I, Jünger C, Michal M, Wiltink J, Wild PS, Münzel T, Lackner KJ, Tibubos AN. Loneliness in the general population: prevalence, determinants and relations to mental health. BMC Psychiatry. 2017;17(1):1–7. https://doi.org/10.1186/s12888-017-1262-x.
45. Calati R, Ferrari C, Brittner M, Oasi O, Olié E, Carvalho AF, Courtet P. Suicidal thoughts and behaviors and social isolation: a narrative review of the literature. J Affect Disord. 2019;245:653–67. https://doi.org/10.1016/j.jad.2018.11.022.
46. Monirpoor N, Khoosfi H, Gholamy Zarch M, Tamaddonfard M, Tabatabaei Mir SF, Alipour M, Karimi Y. Vulnerability to substance abuse and the risk of suicide in students of region 12 of Islamic Azad University. Int J High Risk Behav Addict. 2014;3(2):1–5. https://doi.org/10.5812/ijhrba.11229.
47. Fekih-Romdhane F, Tounsi A, Ben Rejeb R, Cheour M. Is religiosity related to suicidal ideation among Tunisian Muslim Youth after the January 14th Revolution? Commun Ment Health J. 2020;56(1):165–73. https://doi.org/10.1007/s10597-019-00447-z.
48. Svob C, Wickramaratne PJ, Reich L, Zhao R, Talati A, Gameroff MJ, Saeed R, Weissman MM. Association of Parent and offspring religiosity with offspring suicide ideation and attempts. JAMA Psychiatry. 2018;75(10):1062–70. https://doi.org/10.1001/jamapsychiatry.2018.2060.
49. Amponsah M, Owolabi HO. Perceived stress levels of fresh university students in Ghana: a case study. Br J Educational Res. 2011;1(12):153–69. www.science-domain.org.
50. GDHS. (2014). DHS 2014 Key Findings. In *Gdhs*.
51. Opoku-Acheampong A, Kretchy IA, Acheampong F, Afrane BA, Ashong S, Tamakloe B, Nyarko AK. Perceived stress and quality of life of pharmacy students in University of Ghana. BMC Res Notes. 2017;2(1):115. https://doi.org/10.1186/s13104-017-2439-6. PMID: 28253905; PMCID: PMC5335855.
52. Marraccini ME, Brick LAD, Weyandt LL. Instructor and peer bullying in college students: distinct typologies based on latent class analysis. J Am Coll Health. 2018;66(8):799–808. https://doi.org/10.1080/07448481.2018.1454926.
53. Owusu-Ansah FE, Addae AA, Peasah BO, Oppong-Asante K, Osafo J. Suicide among university students: prevalence, risks and protective factors. Health Psychol Behav Med. 2020;5(1):220–33. PMID: 34040869; PMCID: PMC8114407.
54. Owusu A, Hart P, Oliver B, Kang M. The Association between Bullying and Psychological Health among Senior High School students in Ghana, West Africa. J Sch Health. 2011;81(5):231–8. https://doi.org/10.1111/j.1746-1561.2011.00590.x.
55. Antiri KO. Types of bullying in the Senior High Schools in Ghana. J Educ Pract. 2016;7(36):131–8. https://files.eric.ed.gov/fulltext/EJ1126458.pdf.
56. Baiden P, Kuuire VZ, Shrestha N, Tonui BC, Dako-Gyeke M, Peters KK. Bullying victimization as a predictor of suicidal ideation and suicide attempt among senior high school students in Ghana: results from the 2012 Ghana Global School-Based Health Survey. J School Violence. 2019;18(2):300–17. https://doi.org/10.1080/15388220.2018.1486200.
57. Sam DL, Bruce D, Agyemang CB, Amponsah B, Arkorful H. Cyberbullying victimization among High School and University students in Ghana. Deviant Behav. 2019;40(11):1305–21. https://doi.org/10.1080/01639625.2018.1493369.

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