



# Prevalence, Patterns and Correlates of Suicidal Behaviours among Adolescents in Secondary Schools in Bayelsa State

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## Abstract

**Background:** Globally, suicidal behaviour amongst adolescents is a growing public health issue, which may result in early death and lifelong stigma. This study aimed to estimate the lifetime and 12-month prevalence of suicidal behaviours and identify patterns and predictors among in-school adolescents in Yenagoa, Bayelsa state.

**Method:** A total of 336 adolescents aged 10-19 years who were attending school were randomly selected for a cross-sectional study. Data was collected through a self-administered questionnaire that had been adapted from the 'suicide section' of the Nigerian version of the Global School-based Health Survey questionnaire. SPSS version 25 was used for analysis, which included univariate, bivariate and multivariate analysis.

**Result:** Lifetime prevalence of suicidal ideation, plan, and attempt were 33.6%, 18.8%, and 11.6% respectively. The 12-month prevalence for suicide plans and attempts was 12.2% and 7.7% of participants respectively. Risk factors identified for suicide behaviour were being female, attending a school exclusively for girls, coming from a polygamous household, feeling alone, hopeless, and sense of being a burden, having been bullied and assaulted in the past; growing up in a troubled environment; having a family history of suicide attempts and having access to means of suicide. Drug abuse ( $p = 0.027$ ) were associated with increased likelihood of suicidal attempt only.

**Conclusion:** Suicidal behaviour is common among adolescents due to various factors. Early identification is crucial to prevent recurrent tendencies. Collaboration between schools, parents, public health institutions, relevant stakeholders, and Non-Governmental Organisations is necessary to develop comprehensive approaches for timely intervention.

**Keywords:** Suicidal behaviours, Adolescents, Secondary schools, Bayelsa state.

## Introduction

Suicide is a tragedy, and death by suicide is a difficult issue that causes pain to hundred-thousands of people every year around the world. Suicide is the act of deliberately killing oneself.<sup>1</sup> Suicidal behaviours, including suicidal ideation (thought), suicidal plans and suicidal attempts, are known forerunners to suicide.<sup>2</sup>

Suicidal behaviour usually starts with a thought, an idea, follows a spectrum of a plan, then an attempt with either an intention to kill oneself or cause harm to oneself. Suicidal ideations (SI), (thoughts or ideas) broadly describe an array of deliberations, emotions, and obsessions with killing oneself. Furthermore, suicidal plan refers to careful devising a specific method by

which one proposes to kill oneself.<sup>2,3</sup> Suicidal plan, although underreported, sets the stage for the eventual act, while Suicidal attempt is an intentional act of self-harm that could result in injury or death.<sup>2</sup>

The World Health Organisation estimates 800,000 suicide deaths annually.<sup>4,5</sup> Due to the stigma and illegality surrounding suicide in some countries, suicide rates may be underestimated as some cases may be misclassified as unintentional injuries.<sup>6</sup> However, the global suicide rate varies greatly across different regions, with low and lower-middle income countries accounting for 85% of cases, largely due to stigma and cultural sanctions.<sup>4</sup>

Adolescent suicidal behaviour is prevalent globally, with rates ranging from 10.7% to 24.7% for suicidal ideation, 4.0% to 15.5% for suicidal planning, and 3.4% to 4.4% for suicide attempts in high-income countries.<sup>7-10</sup> Some studies done across low, middle to high-income countries have reported the African region as having the highest prevalence of suicidal ideation and planning, while the Asian region has the lowest.<sup>11,12</sup>

A survey in Liberia found, 26.8% of young people aged 10-24 years experienced suicidal thoughts, 36.5% made specific plans, and 33.7% attempted suicide in the past year.<sup>13</sup> Similarly, a study in Ghana reported 25.1% prevalence of suicidal ideation in the past 12 months.<sup>14</sup> Omigbodun et al., reported rates of 20% and 12%, for suicidal ideation and attempts respectively among Nigerians aged 10-17 years in the preceding year.<sup>15</sup> Another study conducted in Lagos, southwest Nigeria, reported a weighted 1-month prevalence for suicidal ideation (6.1%), suicidal planning (4.4%), and suicidal attempts (2.8%).<sup>16</sup>

Suicidal behaviours tends to progress from ideation to plan to attempt over time, with most transitions occurring within the first year of onset of suicidal thoughts.<sup>8,9,17-19</sup> Nock et al. (2013) found that 33.4% of suicide ideators make a plan, and 33.9% attempt suicide. Among ideators, 60.8% with a plan attempt suicide, compared to 20.4% without.<sup>8</sup> Suicide attempts are done using various methods, including hanging, poisoning, and the use of firearms, among others. Pesticide poisoning is the most common method reported of suicide worldwide, while hanging and pesticide poisoning are the most frequently used methods in Africa.<sup>20-23</sup> Access to lethal means of pesticides, firearms, medicines, drugs, and carbon monoxide increases the likelihood of suicide. The ease of access also plays a role in determining the choice of method.<sup>24-26</sup>

Factors associated with suicidal behaviours include being female, poor socioeconomic status, history of bullying, loneliness, tobacco and alcohol use, weak family and social relationships, and various mental health conditions.<sup>11,16,33-35,21,23,27-32</sup> Factors such as having understanding parents and having a smaller number of close friends are negatively associated with suicidal behaviours.<sup>13,27</sup>

Stigma-associated mental health conditions, such as suicide, are grossly underreported, and when it occurs among young persons, it is greeted with shock by policy makers and caregivers, including parents and teachers.<sup>10</sup> This replay of the iceberg phenomenon justifies a thorough look into this menace. Information on completed suicide is difficult to obtain, especially when secretly done; hence, increased research concentration should be on factors for suicidal ideation and attempts.<sup>12</sup>

Unlike states in Southwest Nigeria, Lagos and Ibadan, Bayelsa state lacks school-based studies to guide the state-wide education policy-making process. The Niger Delta University Teaching Hospital documented a hospital-based case series on suicide attempts, reporting only 2 of 5 cases as adolescents with varying psychosocial factors.<sup>36</sup> Identifying factors for suicidal ideation, plans, and attempts in school children can help design appropriate interventions to reduce the burden. This study aims to determine the prevalence, predictors, and protective factors of suicidal behaviours among adolescents in secondary schools in Bayelsa State.

## Method

### *Study Area and population*

This was a school-based study among in-school adolescents aged 10-19 years attending public, private and mission secondary schools for the past 12 months in Bayelsa State.

### *Study design*

A cross-sectional descriptive study conducted between May and August 2022.

### *Sample size determination*

A minimum sample size was calculated using the Cochran formula for cross-sectional studies.

$n = z^2 pq / d^2$ <sup>37</sup> where n is the desired sample size.

Z is the standard deviation at the 95% confidence interval, which is taken as 1.96;

p is prevalence taken as 26.8% from the Prevalence of suicidal ideation form a previous study.<sup>13</sup>

q is 1-p, which is 0.93

d is the acceptable margin of error or degree of precision=0.05. An upward adjustment for 10% to account for nonresponse and inappropriate entries gave a minimum sample size of 335.

### **Sampling technique**

A multistage sampling technique was used to select eligible participants.

**Stage 1:** Selection of schools. Simple random sampling was used to select public and private secondary schools from list of schools obtained from the Ministry of Education. Proportionate to-size allocation was then used to allocate the number to be sampled in the selected schools.

**Stage 2:** Selection of classes: Stratified sampling method to select classes. The stratification was based on the junior and senior secondary levels.

**Stage 3:** Selection of students: Systematic random sampling was used to select participants from the various classes.

### **Data collection procedure**

**Data collection measures:** Data was collected from 336 respondents using a semi-structured, pretested, self-administered questionnaire; adapted from the 'suicide section' of the Nigerian version of the Global School-based Health Survey questionnaire.<sup>38</sup> It comprised five sections: socio-demographic factors, family structure, prevalence, patterns and risk factors for suicidal behaviours.

**Data management:** Data were entered into Statistical Product and Services Solutions (SPSS) 25. Descriptive statistics were utilized to analyse both categorical and continuous variables. Summary statistics were performed to obtain prevalence and frequencies/proportions for various socio-demographic variables. Chi-square and Fisher exact tests were used to test for an association between suicidal behaviours and socio-demographic factors and identify risk factors and protective factors. To determine the predictors of suicidal behaviours, independent variables that showed significant differences between individuals who reported suicidal behaviours and those who did not,  $p < 0.05$ , were selected for binary logistic regression analysis. Three logistic regression models were developed, one each for the three outcome variables - suicidal ideation, planning, and attempt.

### **Operational Definitions**

**Lifetime prevalence:** The proportion of adolescents who have had suicidal behaviour (thought, plan or attempt) at some time in their life.<sup>39,40</sup>

**12-month prevalence:** The proportion of adolescents who had suicidal behaviours in the preceding 12 months.<sup>40</sup>

**Ethical consideration:** Ethical approval was obtained from the Federal Medical Centre Research Ethics Committee, and written permission was obtained from the Bayelsa State Ministry of Education and the school authorities. In addition, en bloc informed consent was obtained from the parents-teachers association representative of the respective schools. Assent and consent were obtained by ticking a consent box on a hardcopy questionnaire by eligible study participants following an explanation of the study aims of the questionnaire.

## **Results**

### **Socio-demographic characteristics of respondents**

A total of 336 students aged 10-19 years participated in this study, comprising 154 (45.8%) male and 182 (54.2%) female students. The mean age of the participants was  $14.7 \pm 1.61$  years. Approximately one-third (34.8%) of the participants were in mixed schools, another third (31.0%) were in girls-only schools, another third (34.2%) were in boys-only schools, and approximately two-thirds (63.7%) were in public day schools. A majority (74.1%) were in senior secondary school (Table 1).

### **Family structure**

A majority (75.0%) of the participants were from monogamous settings, almost a third 99 (29.5%) were first-born, while over two-thirds (66.7%) lived with both parents. Most of the parents had a tertiary level of education and were engaged in government employment. (Table 1)

**Table 1:** Socio-demographic Characteristic of respondents

Variable	Frequency (n=336)	Percent (%)
<b>Age in groups</b>		
10-14	149	44.3
15-19	187	55.7
Mean age	$14.7 \pm 1.61$	
years		
Median age	15yrs	
Modal age	15yrs	
<b>Sex</b>		
Males	154	45.8
Females	182	54.2
<b>Religion</b>		
Christianity	331	98.5
Islam	3	0.9



Variable	Frequency (n=336)	Percent (%)
Others	2	0.6
<b>Gender Structure of school</b>		
Mixed	117	34.8
Boys Only	115	34.2
Girls Only	104	31.0
<b>Type of school</b>		
Public Boarding	82	24.4
Public Day	214	63.7
Private Boarding	10	3.0
Private Day	30	8.9
<b>Class</b>		
JSS	82	24.4
SSS	254	75.6
<b>Type of Family</b>		
Monogamous	252	75.0
Polygamous	84	25.0
<b>Live with</b>		
Both parents	224	66.7
Single parent (Father or mother only)	57	17.0
One Parent with a step-parent	20	6.0
Family relative	21	6.3
Non-relative, Friends, alone	9	2.7
<b>Father's level of Education</b>		
No formal Education	10	3.0
Primary Education	13	3.9
Secondary Education	126	37.5
Tertiary Education	187	55.7

Variable	Frequency (n=336)	Percent (%)
<b>Mother's level of Education</b>		
No formal Education	24	7.1
Primary Education	24	7.1
Secondary Education	130	38.7
Tertiary Education	158	47.0
<b>Jobs of parents/Guardians</b>		
Government	155	46.1
Employed		
Self Employed	147	43.8
Private organization	34	10.1
Employed		

#### Prevalence of suicidal behaviour

The lifetime prevalence of suicidal ideation (SI), suicidal plan (SP), and suicidal attempt (SA) was 113 (33.6%), 63 (18.8%) and 39 (11.6%), respectively, with 28 (24.8%) having the idea 3 or more times in a month. (Table 2)

A 12-month prevalence of 42 (12.5%) and 26 (7.7%) was revealed for suicide plans and suicide attempts, respectively. Thus, 36.9% and 23.0% of those who made plans and attempts, respectively, had ideation in the last 12 months. Of those who made plans in the preceding 12 months, 4 (9.5%) said they wanted to die, while 1 (3.8%) who attempted suicide wanted to die. Thirty-seven (11.1%) had told someone they wanted to die or commit suicide, the majority 23 (62.2%) of whom told their friends (peers). Twenty-six (7.8%) participants agree that they are likely to attempt suicide someday. (Table 2)

**Table 2:** Prevalence of Suicidal Behaviours

Variable	Frequency (n=336)	Percentage (%)
<b>Lifetime Suicidal Ideation</b>		
Yes	113	33.6
No	223	66.4
<b>If yes, how often</b>	<b>N=113</b>	
Rarely (1 time)	40	35.4
Sometimes (2 times)	45	39.8
Often (3-4 times)	13	11.5
Very often (5 or more times)	15	13.3
<b>Lifetime Suicidal Plans</b>		
Yes	63	18.8
No	273	81.3
<b>If YES</b>	<b>n=63</b>	
I have had a plan at least once to kill myself but did not try to do it	58	92.1
I have had a plan at least once to kill myself and really wanted to die	5	7.9



Variable	Frequency (n=336)	Percentage (%)
<b>Suicidal Plan in the past 12 months</b>		
Yes	42	12.5
No	294	87.5
<b>If YES</b>		
I have had a plan at least once to kill myself but did not try to do it	38	90.5
I have had a plan at least once to kill myself and really wanted to die	4	9.5
<b>Lifetime Suicide attempt</b>		
Yes	39	11.6
No	297	88.4
<b>If Yes</b>		
I have attempted to kill myself but did not want to die	38	97.4
I have attempted to kill myself and really hoped to die	1	2.6
<b>Suicide attempt in the past 12 months</b>		
Yes	26	7.7
No	310	92.3
<b>If Yes</b>		
I have attempted to kill myself but did not want to die	25	96.2
I have attempted to kill myself and really hoped to die	1	3.8
<b>Ever told someone that you were going to commit suicide</b>		
No	299	89.0
Yes	37	11.1
<b>If Yes, who did you tell</b>		
My Parents	5	13.5
My Teacher	1	2.7
My Friend	23	62.2
Pastor	3	8.1
Others (specify)	5	13.5
<b>Likelihood of attempting suicide some day?</b>		
Never	290	86.3
Unlikely	20	6.0
Likely	26	7.8

Table 3 reveals the pattern of suicidal attempts known and used by participants: The most common method of committing suicide known by participants was by hanging oneself 155 (46.1%) and drinking harmful substances 134 (39.9%). This is reflected in the method

attempted by participants, as the most common method of suicide attempt by participants was drinking harmful substances 16 (42.1%) (Which ranged from bleach, fuel, acid, and sniper), followed by hanging oneself 10 (26.3%)

**Table 3:** Patterns of suicidal attempts

Variable	Frequency (n=336)	Percentage (%)
<b>Ways of committing suicide you know (multiple answers)</b>		
Hanging	155	46.1
Drinking harmful substances	134	39.9
Stabbing oneself	31	9.2
Jumping from heights	14	4.2
Drowning/ Electrocuting/ Slitting one's wrist	5	1.5
<b>Have you ever tried any?</b>		
No	297	88.4
Yes	38	11.3
<b>If yes; which one(s)</b>		





Variable	Frequency (n=336)	Percentage (%)
Hanging	10	26.3
Stabbing	8	21.1
Drinking harmful substance (bleach, acid, sniper, fuel, soapy water)	16	42.1
Jumping from heights	2	5.3
Strangling oneself	2	5.3

**Risk Factors for Suicidal Behaviour**

Lifetime prevalence for suicidal ideation was significantly higher among female participants ( $\chi^2 = 10.216, p = 0.0001$ ) although plan and attempt were higher in the males, it was not statistically significant ( $p > 0.05$ )

Among the school-related factors, adolescents in private day and public boarding schools showed a significant association with suicidal ideation ( $\chi^2 = 15.02, p = 0.002$ ) and planning ( $\chi^2 = 11.78, p = 0.008$ ) but not with attempts ( $\chi^2 = 2.97, p = 0.40$ ), while adolescents in girls only school were found to be significantly associated with ideation ( $\chi^2 = 6.83, p = 0.03$ ).

Among the family-related factors, adolescents in polygamous settings were significantly associated with suicidal plans ( $\chi^2 = 7.09, p = 0.008$ ) and attempts ( $\chi^2 = 4.05, p = 0.042$ ) but not suicidal ideation. Additionally, suicidal behaviour [ideation ( $\chi^2 = 5.95, p = 0.015$ ), plan ( $\chi^2 = 10.04, p = 0.002$ ), and attempt ( $\chi^2 = 4.80, p = 0.02$ )] was found to be more likely in adolescents who had a family member who had attempted suicide. None of the suicidal behaviours differed according to who the adolescent lived with either with both parents, single parents or a family relative.

Psychosocial factors identified among participants that were associated with suicidal behaviour included loneliness (SI ( $\chi^2 = 26.275, p = 0.000$ ), SP ( $\chi^2 = 32.643, p = 0.000$ ) and SA ( $\chi^2 = 24.069, p = 0.000$ )), hopelessness (SI ( $\chi^2 = 5.483, p = 0.019$ ) and SP ( $\chi^2 = 4.616, p = 0.032$ ), sense of being a burden: SI ( $\chi^2 = 20.112, p = 0.000$ ), SP ( $\chi^2 = 28.582, p = 0.000$ ) and SA ( $\chi^2 = 12.620, p = 0.000$ ), growing in a problematic environment: SI ( $\chi^2 = 4.497, p = 0.034$ ), SP ( $\chi^2 = 5.599, p = 0.018$ ) and SA ( $\chi^2 = 4.180, p = 0.041$ ), and being bullied, assaulted or traumatized: SI ( $\chi^2 = 4.399, p = 0.036$ ), SP ( $\chi^2 = 5.590, p = 0.018$ ) and SA ( $\chi^2 = 5.032, p = 0.025$ ). family history of suicide attempt, SI ( $\chi^2 = 7.042, p = 0.008$ ), SP ( $\chi^2 = 10.770, p = 0.001$ ) and SA ( $\chi^2 = 6.683, p = 0.010$ ), spontaneous and impulsive: SI ( $\chi^2 = 9.588, p = 0.002$ ), SP ( $\chi^2 = 9.329, p = 0.002$ ) and SA ( $\chi^2 = 6.966, p = 0.008$ ), access to means of committing suicide: SI ( $\chi^2 = 28.923, p = 0.000$ ), SP ( $\chi^2$

$= 67.962, p = 0.000$ ) and SA ( $\chi^2 = 52.605, p = 0.000$ ) and experiencing hallucinations: SI ( $\chi^2 = 7.652, p = 0.006$ ), SP ( $\chi^2 = 6.720, p = 0.010$ ) and SA ( $\chi^2 = 5.775, p = 0.016$ ), while drug use was only associated with SA ( $\chi^2 = 5.867, p = 0.015$ ) as shown in table 4



**Table 4:** Factors associated with Suicidal behaviour for suicidal behaviour among secondary school students

Variable	Suicidal ideation				Suicidal Plan				Suicidal attempt			
	Yes N (%)	No	$\chi^2$	p-value	Yes	No	$\chi^2$	p-value	Yes	No	$\chi^2$	p-value
Age												
10-14	52 (34.9)	97 (65.1)	0.193	0.660	30 (20.1)	119 (79.9)	0.337	0.562	17 (11.4)	132 (88.6)	0.135	0.713
15-19	61 (32.6)	126 (67.4)			33 (17.6)	154 (82.4)			19 (10.2)	168 (89.8)		
<b>Sex</b>												
Male	38 (24.7)	116 (75.3)	10.216	0.001*	23 (14.9)	131 (85.1)	2.716	0.099	15 (9.7)	139 (90.3)	0.282	0.595
Female	75 (41.2)	107 (58.8)			40 (22.0)	142 (78.0)			21 (11.5)	161 (88.5)		
<b>Type of School</b>												
Public Boarding	35 (42.7)	47 (57.3)	15.016	0.002*	16 (9.5)	66 (80.5)	11.779	0.008*	8 (9.8)	74 (90.2)	2.970	0.396
Public Day	57 (26.6)	157 (73.4)			32 (15.0)	182 (85.0)			21 (9.8)	193 (90.2)		
Private Boarding	4 (40.0)	6 (60.0)			3 (30.0)	7 (70.0)			1 (10.0)	9 (90.0)		
Private Day	17 (56.7)	13 (43.3)			12 (40.0)	18 (60.0)			6 (20.0)	24 (80.0)		
<b>Gender Structure</b>												
Mixed	44(37.6)	73 (62.4)	6.832	0.033*	26 (22.2)	91(77.8)	2.130	0.345	15 (12.8)	102 (87.2)	0.833	0.659
Boys Only	28(24.3)	87 (75.7)			17 (14.8)	98 (85.2)			11 (9.6)	104 (90.4)		
Girls Only	41(39.4)	63(60.6)			20 (19.2)	84 (80.8)			10 (9.6)	94 (90.4)		
<b>Family Structure</b>												
Monogamous	78 (31.0)	174 (69.0)	3.240	0.072	39 (15.5)	213 (84.5)	7.092	0.008*	22 (8.7)	230 (91.3)	4.148	0.042*
Polygamous	35 (41.7)	49 (58.3)			24 (28.6)	60 (71.4)			14 (16.7)	70 (83.3)		
<b>Loneliness</b>												
Yes	42 (59.2)	29 (40.8)	26.275	0.000*	30 (42.3)	41 (57.7)	32.643	0.000*	20 (28.2)	51 (71.8)	24.067	0.000*
No	71 (26.8)	194 (73.2)			33 (12.5)	232 (87.5)			19 (7.2)	246 (92.8)		
<b>Hopelessness</b>												
Yes	26 (47.3)	29 (52.7)	5.483	0.019*	16 (29.1)	39 (70.9)	4.616	0.032*	10 (18.2)	45 (81.8)	2.771	0.096
No	87 (31.0)	194 (69.0)			47 (16.7)	234 (83.3)			29 (10.3)	252 (89.7)		
<b>Helplessness</b>												
Yes	38 (32.2)	80 (67.8)	0.166	0.684	28 (23.7)	90 (76.3)	2.959	0.085	17 (11.1)	101 (88.9)	1.389	0.239
No	75 (34.4)	143 (65.6)			35 (16.1)	183 (83.9)			22 (10.2)	196 (89.8)		
<b>Drug Abuse</b>												
Yes	11 (40.7)	16 (59.3)	0.665	0.415	8 (29.6)	19 (70.4)	2.281	0.131	7 (25.9)	20 (74.1)	5.867	0.015*
No	102 (33.0)	207 (67.0)			55 (17.8)	254 (82.2)			32 (10.4)	277 (89.6)		
<b>Sense of being a burden</b>												
Yes	51 (51.5)	48 (48.5)	20.112	0.000*	36 (36.4)	63 (63.6)	28.582	0.000*	21 (18.9)	78 (81.1)	12.620	0.000*
No	62 (26.2)	175 (73.8)			27 (11.4)	210 (88.6)			18 (7.3)	219 (92.7)		
<b>History of attempted suicide in family</b>												
Yes	27 (49.1)	28 (50.9)	7.042	0.008*	19 (34.5)	36 (65.5)	10.770	0.001*	12 (19.2)	43 (91.0)	6.683	0.010*



Variable	Suicidal ideation				Suicidal Plan				Suicidal attempt			
	Yes N (%)	No	$\chi^2$	p-value	Yes	No	$\chi^2$	p-value	Yes	No	$\chi^2$	p-value
Age												
No	86 (30.6)	195 (69.4)			44 (15.7)	237 (84.3)			27 (9.0)	254 (80.8)		
<b>History of death by suicide in family</b>												
Yes	9 (36.0)	16 (64.0)	0.068	0.794	6 (24.0)	19 (76.0)	0.489	0.485	4 (16.0)	21 (84.0)	0.499	0.480
No	104 (33.4)	207 (66.6)			57 (18.3)	254 (81.7)			35 (9.9)	275 (90.1)		
<b>Bullied, assaulted, traumatised</b>												
Yes	55 (40.1)	82 (59.9)	4.399	0.036*	34 (24.8)	103 (75.2)	5.590	0.018*	20 (14.8)	115 (85.2)	5.032	0.025*
No	58 (29.1)	141 (70.9)			29 (14.6)	170 (85.4)			14 (7.2)	181 (92.8)		
<b>Growing in problematic environment (e.g. broken home, very poor family)</b>												
Yes	31 (44.3)	39 (55.7)	4.497	0.034*	20 (28.4)	50 (71.6)	5.599	0.018*	13 (18.6)	57 (81.4)	4.180	0.041*
No	82 (30.8)	184 (69.2)			43 (15.6)	223 (84.4)			26 (9.8)	240 (90.2)		
<b>Spontaneous and Impulsive action</b>												
Yes	55 (43.1)	70 (56.9)	9.588	0.002*	34 (26.8)	91 (73.2)	9.329	0.002*	22 (17.6)	103 (82.4)	6.966	0.008*
No	58 (27.3)	153 (72.7)			29 (13.7)	182 (86.3)			17 (8.1)	194 (91.9)		
<b>Access to means for suicide</b>												
Yes	48 (57.8)	35 (42.2)	28.923	0.000*	41 (49.4)	42 (50.6)	67.962	0.000*	28 (33.7)	55 (66.3)	52.605	0.000*
No	65 (25.7)	188 (74.3)			22 (8.7)	231 (91.3)			11 (4.3)	242 (95.7)		
<b>Experience Hallucination (auditory)</b>												
Yes	39 (45.9)	46 (54.1)	7.652	0.006*	24 (28.2)	61 (71.8)	6.720	0.010*	16 (18.8)	69 (81.2)	5.775	0.016*
No	74 (29.5)	177 (70.5)			39 (15.5)	212 (84.5)			23 (9.2)	228 (90.8)		
<b>Aware that Suicide is a crime</b>												
Yes	83 (33.5)	165 (66.5)	0.011	0.915	49 (19.8)	199 (80.2)	0.623	0.427	27 (10.9)	221 (89.1)	0.479	0.489
No	30 (34.1)	85 (65.9)			14 (15.9)	74 (84.1)			12 (13.6)	76 (86.4)		

\*- statistically significance



### Predictors of suicidal behaviour

Table 5 shows the final regression logistic models, revealing the predictors for suicidal behaviour amongst our study participants.

The significant predictors for SI were being female (OR = 2.269,  $p = 0.003$ , 95% CI = 1.321 – 3.897), loneliness (OR = 2.184,  $p = 0.013$ , 95% CI = 1.176 – 4.054), sense of being a burden (OR = 2.007,  $p = 0.018$ , 95% CI = 1.126 – 3.577), History of suicide attempt in the family (OR = 2.109,  $p = 0.028$ , 95% CI = 1.084 – 4.106) and access to means for suicide (OR = 2.665,  $p = 0.001$ , 95% CI = 1.501 – 4.732).

For SP, the significant predictors were polygamy (OR = 2.662,  $p = 0.009$ , 95% CI = 1.271– 5.573), loneliness (OR = 2.363,  $p = 0.018$ , 95% CI = 1.156 – 4.834), sense of being a burden (OR = 3.641,  $p = 0.000$ , 95% CI = 1.760 – 7.531), History of suicide attempt in the family (OR = 2.960,  $p = 0.010$ , 95% CI = 1.303 – 6.725) and access to means for suicide (OR = 7.371,  $p = 0.000$ , 95% CI = 3.745 – 14.509).

The predictor for SA were polygamy (OR = 3.121,  $p = 0.008$ , 95% CI = 1.346– 7.235), sense of being a burden (OR = 2.646,  $p = 0.026$ , 95% CI = 1.124 – 6.227) and access to means for suicide (OR = 8.665,  $p = 0.000$ , 95% CI = 3.780 – 19.862).

**Table 5:** Predictors for suicidal Behaviour among secondary school students

Variable	Odd ratio	95% confidence interval	p-Value
<b>SUICIDAL IDEATION</b>			
<b>Sex</b>			
Male		1	
Female	2.269	1.321 – 3.897	0.003
<b>Loneliness</b>			
Yes	2.184	1.176 – 4.054	0.013
No		1	
<b>Sense of being a Burden/disappointment</b>			
Yes	2.007	1.126 – 3.577	0.018
No		1	
<b>Access to Means to committing suicide</b>			
Yes	2.665	1.501 – 4.732	0.001
No		1	
<b>History of Suicide attempt in Family</b>			
Yes	2.109	1.084 – 4.106	0.028
No		1	
<b>SUICIDAL PLANS</b>			
<b>Family Structure</b>			
Monogamy		1	
Polygamy	2.662	1.271 – 5.573	0.009
<b>Loneliness</b>			
Yes	2.363	1.156 – 4.834	0.018
No		1	
<b>Sense of being a Burden/disappointment</b>			
Yes	3.641	1.760 – 7.531	0.000
No		1	
<b>History of Suicide attempt in Family</b>			
Yes	2.960	1.303 – 6.725	0.010
No		1	
<b>Access to Means to commit suicide</b>			
Yes	7.371	3.745 -14.509	0.000
No		1	
<b>SUICIDAL ATTEMPT</b>			
<b>Family Structure</b>			
Monogamy		1	
Polygamy	3.212	1.346 – 7.235	0.008



**Sense of being a Burden/disappointment**

Yes	2.646	1.124 – 6.227	0.026
No		1	

**Access to Means to commit suicide**

Yes	8.665	3.780 – 19.862	0.000
No		1	0.000

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## Discussion

We aimed to report the current prevalence of suicidal behaviours and examine the patterns and correlates among adolescents in schools in Bayelsa state. This will inform the design of interventions that will address the needs of adolescents.

### *Prevalence of Suicidal behaviours*

The prevalence of self-reported suicidal ideation, plans and attempts was 33.6%, 18.8% and 11.6%, respectively. When compared to the results of a pooled analysis across 59 LMIC, where the African region reported the highest prevalence for SI (20.4%, 17.3-23.6) and SP (23.7%, 19.1-28.3), a multicentre study performed in Ethiopia<sup>29</sup> which reported lifetime SI and SA of 13.82% and 7.61%, respectively, and from findings in a study in Southwest Nigeria,<sup>15</sup> which reported prevalence of 20% for SI. This study reported a higher level for suicidal ideation, with varying levels of consistency and variations for suicidal plans and attempts. These variations may be due to differences in assessment tools or because of different time periods analysed for prevalence. Due to harsh socioeconomic realities, suicidal behaviours among adolescents have increased. This is evidenced by sporadic case reports of attempted suicide in Accidents & Emergency units in hospitals.<sup>36</sup>

In the past 12 months, the prevalence of suicide plans and attempts was 12.2% and 7.7%, respectively, in this study, which was lower than that reported from a survey in Lagos by Omigbodun et al. of 20% and 12%<sup>15</sup> for ideation and attempts in the last one year, despite the similarities in sampling strategy and social structure of the participants. It varied widely from another study performed in Lagos<sup>16</sup> that reported a weighted 1-month prevalence of 6.1%, 4.4% and 2.8% for ideation, planning and attempt respectively. This dissimilarity may be due to differences in study duration. The Lagos study assessed the past month, while our study assessed the past year. In addition, our study showed significant variation from a study conducted in Mozambique,<sup>31</sup> where the prevalence of suicidal ideation, plan, and attempt was 17.7%, 19.6%, and 18.5%, respectively. Similarly, another study conducted in Liberia<sup>13</sup> reported higher prevalence rates of 36.5% and 33.7% for plan and attempt, respectively, in the preceding 12 months. Sociocultural, religious, and economic factors may have caused differences in interpreting attitudes towards suicide, leading to variations in the prevalence of suicidal behaviours in our study compared to other studies in African countries. As a result, rates of suicidal thoughts

and attempts seem to differ by country and even within country variations, which can be attributed to the intricate and interconnected nature of the underlying factors influencing suicidal behaviours at the individual, community, and societal levels.

### *Patterns of suicidal attempts*

The WHO reported pesticide poisoning as the most frequent method of suicide and suicide attempt worldwide,<sup>20</sup> this was also reported by a literature review on suicidal behaviours across the African continent.<sup>22</sup> This report revealed that some of the most recurrent methods used for suicide and suicidal attempts were hanging and pesticide poisoning. This is similar to findings from our study, as the majority of those who have attempted suicide reported drinking harmful substances such as insecticides, household bleach (hypochlorite), acids, and hanging; this similarity in results could be due to the locally available means that are easily accessible in the environment and also, knowledge of methods of the suicide act from peers/social groups/social media. This is at variance with the use of firearms, as was reported in some climes.<sup>26</sup>

### *Risk Factors*

Suicidal behaviours were higher in the females than the males in this study and being female was statistically associated with suicide ideations and females were 2 times more likely to have suicidal thoughts than their male counterparts. Although plans and attempts did not vary statistically by age or sex, this finding is buttressed by other studies<sup>9,11,14,16,28,32</sup> worldwide and has been linked to personal issues and relationship troubles that affect females more than males. The higher prevalence of suicidal thoughts among adolescent girls can possibly be attributed to multiple factors, such as gender inequality, girls' likelihood to internalize their distress as compared to boys, which could also contribute to their higher rates of suicidal thoughts. Females who have experienced personal issues and interpersonal difficulties may be more susceptible to having suicidal thoughts compared to males.<sup>13</sup> Additionally, girls also report damaging consequences from polygamous families more frequently, and they are more likely to have suicidal thoughts after a romantic relationship ends. According to some studies,<sup>13,28</sup> girls are more likely than boys to experience sexual abuse. This finding contradicts previous studies<sup>28,33</sup> that found suicidal behaviours to be more prevalent among males, suggesting that although females may have more thoughts about suicide, it is



commoner for males to actually plan and attempt suicide due to their tendency to take risks.<sup>11</sup>

Suicidal behaviours has been found to strongly correlate with family ties and relationships.<sup>10,14,29,30</sup> Our study found that family-related factors, such as polygamy and a history of suicide attempts in the family, were positively associated with suicidal behaviours. Suicidal thoughts and attempts were two and three times more common, respectively, among those from polygamous households. Suicidal ideation and plans were, however, two and three times more common in those with a family history of attempted suicide. This validates findings from another survey,<sup>22</sup> which indicate that suicidal behaviours are less likely in the appearance of supportive social and family-related factors. It's worth noting, though, that suicidal behaviours in our study were linked to history of attempts in family member, rather than suicide deaths in the family. This could suggest that while adolescents might have suicidal behaviours, when faced with the reality of dying they might not really want to die, as is reported in this study where a majority of those who made plans and attempts did not really want to die. Thus, adolescents who have been faced with the harsh reality of actual death by suicide in their families and have experienced the fact that a suicide attempt might actually result in a death, understand the consequences of suicidal behaviour.

Loneliness, hopelessness, sense of being a burden, hallucinations, growing in a difficult or problematic environment, experienced bullying, have-been assaulted or traumatized, were all positively associated with suicidal behaviour in this study as is consistent with reports from several studies<sup>11,16,29,32,41</sup> globally. Adolescents who felt lonely and thought they were a burden or hopeless were at greater odds for suicidal behaviours, as these feelings had a way of isolating the individual. Loneliness has been reported in several studies<sup>33,42</sup> as a predictor for suicidal ideation and plans, while having a few close friends was protective.<sup>13,31</sup> This could be deduced from this study; a majority of the participants who told somebody, confided in their friends that they were going to commit suicide, an action which seemed to have protected them from going through with an attempt. Thus, emphasizing the significance of social and peer support in the role of maintaining mental well-being. Drug abuse was associated with attempts and not ideation and plans in this study. This is explainable by the fact that such substances due to their psychoactive properties could make their users to act irrationally, influencing their decisions to attempt to end their lives. Under the

influence of drugs or psychoactive substances one could take some irrational decisions that might not really reflect the persons' intention when in a sober state.

Persons with access to means such as pesticides, firearms and conducive environments more frequently engage these methods to end their lives compared with those without access to such means. As was seen in our study, having access to means of committing suicide was one of the predictors of all suicidal behaviour (ideation, plan and attempt). Thus, some studies<sup>20,24,26</sup> have suggested that reducing access to pesticides by banning those that are most toxic to humans in environments where they are prevalent like ours could be an effective means of reducing suicide rates.

#### *Implications of the findings*

The findings of this study reinforce what is known about suicidal behaviours; there was a high prevalence of suicidal behaviors. It also confirms the iceberg phenomenon. Understanding the fact that it was a school community study with higher prevalence than was reported in health facilities in Bayelsa from a previous study,<sup>36</sup> it buttresses the fact that estimates of prevalence of a stigmatizing public health problem are better pooled from the relevant communities than health facilities. The 12-month prevalence obtained shows that suicidal behaviours are still very common among adolescents who though having survived the 1<sup>st</sup> decade of their lives, fraught with the challenges of vaccine preventable diseases still face the risk of not surviving beyond adolescence. The high prevalence of suicidal behaviours amongst Females highlights the need for gender considerations in designing and implementing suicide prevention interventions.

Family history of death by suicide was not associated with suicidal behaviours, suggesting that adolescents need to be made aware of the possibility of an outcome of actual death resulting from an attempt, which could dissuade them since majority of those who have made attempts didn't really want to die.

Access to suicide-related means is a significant risk factor, affecting suicidal ideation, planning, and attempts. Prohibiting adolescent's access to lethal self-harm items and improving pesticide poisoning control can help mitigate this risk. Utilizing the One-health approach to ban and take off shelf, toxic pesticides and regulate the sales of pesticides by restricting access to only farmers and environmental health officers.



Schools will need to foster peer relationships and the existence of academic clubs as they create support, collaboration, and healthy teamwork. In addition, improving and expanding School health program services to include counselling and surveillance against lethal items could address suicidal behaviours among in-school adolescents. This is in line with relevant sections of Safe School declaration which if domesticated in Bayelsa state could guide enforcement. Furthermore, family ties can be strengthened by improving the activities of the Parents Teachers Association in schools. Nigerian policymakers and health providers must urgently address suicide by identifying suicidal behaviours and intervene with the transition from suicidal thoughts to action involving NGOs, public health institutions, parents, and schools in an educational setting.

Nigeria's ministry of women and children affairs should prioritize Trauma counselling in its rehabilitative efforts for childhood exposure to violence especially among the female gender as repressed feelings of violence may precipitate suicidal ideations in the future.

#### ***Strengths and limitations of the study***

The disaggregation of the prevalence of the three arms of suicidal behaviours and their risk factors helps us understand their peculiarities and their relatedness. The study population of in-school adolescents seem most appropriate for this type of study. Most stigma-related mental health conditions usually evoke surprise, disgust or concern among caregivers and relevant stakeholders. Such emotions are usually not appropriate nor sufficient to address the menace without a scholarly evidence base for action. This study becomes one to be referenced.

This study did not have as its objective a further exploring of the respondents' reasons for attempting suicide. There may be a need for a follow up qualitative study among respondents who have attempted suicide for a better elucidation of factors.

#### **Conclusion**

Suicidal behaviour was prevalent among adolescents in schools and higher than the reported prevalence in the sub-Saharan Africa region. Identified risk factors included being female, polygamy, history of suicide attempts in the family, loneliness, hopelessness, sense of being a burden, history of being bullied or assaulted, and auditory hallucinations.

Family history of death by suicide was not associated with suicidal behaviours, suggesting that adolescents need to be made aware of the possibility of an outcome

of actual death resulting from an attempt, which could dissuade them since majority of those who have made attempts didn't really want to die. Schools should foster peer relationships and the existence of academic clubs as they create support, collaboration, and healthy teamwork.

Access to suicide-related means is a significant risk factor, affecting suicidal ideation, planning, and attempts. Public health authorities should consider this when developing interventions to teach coping mechanisms and prevent risky behaviours. Reducing access to lethal self-harm and improving pesticide poisoning management can help mitigate this risk.

Nigerian policymakers and health providers must urgently address suicide by identifying suicidal behaviours and intervene with the transition from suicidal thoughts to action involving NGOs, public health institutions, parents, and schools in an educational setting.

#### **Declarations**

***Ethical Consideration:*** Ethical approval was obtained from the Federal Medical Centre Research Ethics Committee, and written permission was obtained from the Bayelsa State Ministry of Education and the school authorities. In addition, en bloc informed consent was obtained from the parents-teachers association representative of the respective schools. Assent and consent were obtained by ticking a consent box on a hardcopy questionnaire by eligible study participants following an explanation of the study aims of the questionnaire.

***Authors' Contribution:*** OIO conceptualized the study. All Authors participated in the design of the study, coordinated data collection and initial manuscript drafting. OIO performed statistical analysis and interpreted the data. OIO and KID drafted the final manuscript. OFE and UIM critically reviewed the manuscript for correctness. All authors read and approved the final manuscript.

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