


Suicidal ideation and suicide attempt among pregnant adolescent girls in Ghana: a cross-sectional study

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ABSTRACT

Background Globally, suicide is the third leading cause of death among girls aged 15–19 years. However, there is a growing concern that suicide research has paid little attention to pregnant adolescent girls, particularly in low-income and middle-income countries, including Ghana, where nearly one in seven adolescents experiences (unwanted) pregnancy.

Aims To assess the prevalence and correlates of suicidal ideation and suicide attempt and the self-reported reasons for attempted suicide among pregnant adolescent girls in Ghana.

Methods We collected cross-sectional data (between August 2022 and December 2023) using structured anonymous questionnaires from a sample of 449 pregnant adolescent girls (aged 14–19 years) drawn from the three geographical zones of Ghana. We applied bivariable and multivariable analysis techniques to the data.

Results Overall, 28.51% (95% confidence interval (CI) 24.37% to 32.93%) reported suicidal ideation, and 18.04% (95% CI 14.59% to 21.91%) reported suicide attempt during the current pregnancy. Participants who reported attempted suicide endorsed more interpersonal reasons (eg, to communicate distress, to seek help or to influence others) than intrapersonal reasons for their attempted suicide. In the final adjusted logistic regression models, food insecurity (adjusted odds ratio (aOR)=2.69; 95% CI 1.34 to 5.41; $p=0.005$) was uniquely associated with increased odds of suicidal ideation. Adverse childhood experiences (aOR=3.04; 95% CI 1.33 to 6.97; $p=0.008$), history of attempted suicide before current pregnancy (aOR=3.47; 95% CI 1.27 to 9.47; $p=0.015$) and depression (measured by the 5-item World Health Organization Well-Being Index; aOR=0.31; 95% CI 0.12 to 0.77; $p=0.012$) were uniquely associated with increased odds of suicide attempt. Five variables were commonly associated with increased odds of both suicidal ideation and suicide attempt: conflict with parents, alcohol use, pregnancy-related anxiety, history of attempted suicide and intimate partner violence. While being in junior high school was uniquely associated with reduced odds of suicidal ideation, intimate partner's acceptance of paternity was commonly associated with reduced odds of both suicidal ideation and suicide attempt.

Conclusions Although the prevalence estimates of suicidal ideation and suicide attempt in this study are comparable with known rates among non-pregnant

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Pregnancy is associated with heightened vulnerability to depression and anxiety, which in turn elevates the risk for antepartum suicidal outcomes. However, compared with high-income countries, little is known about suicidal behaviour among pregnant adolescent girls in low and middle-income countries, including Ghana.

WHAT THIS STUDY ADDS

⇒ The current study is the first to examine the prevalence and correlates of suicidal ideation and suicide attempt and self-reported reasons for attempted suicide among pregnant adolescent girls in Ghana. In particular, the evidence highlights the importance of intimate partner violence and adolescent–parent conflict in antepartum suicidal behaviour among adolescent girls.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ This study serves as an informative point of departure for more expansive studies on antepartum suicidal behaviour in pregnant adolescent girls not only in Ghana but also in other sub-Saharan African countries; the key evidence underscores a need for both routine antenatal primary care mental health screening for suicidality and related risks and targeted prevention and intervention programmes.

adolescent girls in Ghana, additional research is needed to nuance our understanding of the correlates identified in this study. The evidence also highlights a need for both routine antepartum primary care mental health screening for suicidality and related risks and targeted prevention and intervention programmes.

INTRODUCTION

Suicidal behaviour refers to ‘a range of behaviours that include thinking about suicide (or ideation), planning for suicide, attempting suicide and suicide itself’.¹ Annually, 703 000 suicidal deaths are recorded globally, and about 79% of the world's suicides are

recorded in low and middle-income countries (LMICs), with the Africa region recording the highest rate—11.2 per 100 000 people.² Adolescents (persons aged 10–19 years) are particularly at elevated risk of suicide. Globally, suicide is the fourth leading cause of death among young persons aged 15–19 years but the third leading cause of death among girls in this age group after maternal conditions.²

There is a growing global concern that suicide research and prevention efforts have overlooked and focused little attention on pregnant women, particularly pregnant adolescent girls.^{3–6} Pregnancy is a period of risk and high sensitivity for women due to increased rapid physiological and psychological changes. Pregnancy is associated with heightened vulnerability to depression and anxiety, and the risk could be particularly higher if the pregnancy is unplanned/unintended or unwanted.^{6,7} This evidence is important because antepartum depression and anxiety represent strong risks for antepartum and postpartum suicidal outcomes.^{3,4,6,7} Notably, most of what we know about suicidal behaviour during pregnancy comes from high-income countries.^{3,4} Published global systematic reviews have indicated that the prevalence of suicidal ideation varies widely from 3% to 33%; it ranges between 23% and 33% among pregnant women in the USA.⁶ Suicide attempts are reported for between 24% and 49% of pregnant women with a history of postpartum depression, and between 26.4% and 34.1% of pregnant women experiencing depression report suicidal behaviour.⁴ In terms of risk factors for suicidal behaviour during pregnancy, several factors have been identified, such as being unmarried, young maternal age, family conflict, intimate partner rejecting paternity, loneliness, lack of family support, exposure to disaster, exposure to domestic violence (including intimate partner physical, sexual and/or emotional abuse victimisation), unplanned/unintended pregnancy, history of psychiatric disorders, history of suicide attempt or suicidal ideation, pregnancy-related anxiety, depression, inadequate housing and social and racial discrimination.^{3,4,6}

However, we know little from LMICs (including those in (sub-Saharan) Africa) about suicidal behaviour during pregnancy, although maternal depression is a key contributor to pregnancy-related morbidity and mortality in the region.^{5,7,8} In sub-Saharan Africa, about one out of seven adolescent girls experiences (unwanted) pregnancy and associated maternal conditions (ie, health issues experienced by women during pregnancy, childbirth and the postnatal period, including infection, excessive blood loss, unsafe abortion, high blood pressure and obstructed labour as well as indirect conditions such as malaria, anaemia and heart disease).⁹ These circumstances — in addition to depression, social adversities and lack of access to professional (mental) healthcare—are factors known to be related to increased risk of female suicide.⁸ Thus, these troubling facts provide a basis to suspect self-harm and suicidal behaviour to be an issue among pregnant adolescent girls and young women within

the subregion.⁵ Currently, within sub-Saharan African countries, including Ghana, national-level representative data on suicidal behaviour and associated risks and protective factors among pregnant adolescent girls are either unavailable (eg, in Ghana) or woefully sparse (eg, in South Africa or Ethiopia) to support evidence-based intervention programmes and prevention efforts.^{5,8}

Crude estimates by the Ghana Health Service suggest that 542 131 pregnancies among teenage girls aged 15–19 years and 13 444 pregnancies among young adolescents aged 10–14 years were recorded between 2016 and 2020 respectively across Ghana.¹⁰ Among girls aged between 15 and 19 years, 14% had a live birth or are currently pregnant with their first child, with girls in the lowest wealth quintile being five times more likely—than those in the richest quintile—to give birth before age 20.¹¹ A population-based cluster survey of 225 pregnant teenage girls in the Central Region of Ghana suggests that about 3 out of 10 of these pregnant adolescent girls report depression, and nearly 4 in 10 experience food insecurity (hunger).¹² National-level data suggest that 2 in 10 adolescent girls in Ghana experience intimate partner violence victimisation.¹¹ These strands of evidence are critical, considering that the suicidology literature identifies these factors as (putative) risks for suicidal behaviour in young people, particularly during pregnancy.^{3,4,13}

While there are no studies on suicidal behaviours among pregnant adolescent girls in Ghana, available published studies have estimated the 12-month prevalence of suicidal ideation (21.7%; 95% confidence interval (CI) 19.1% to 24.5%) and suicide attempt (23.5%; 95% CI 20.7% to 26.3%) among non-pregnant adolescent girls in the country.¹⁴ Also, factors related to interpersonal relationship problems and social adversities within and outside the family context (eg, conflict with parents, intimate partner violence victimisation, food insecurity, bullying victimisation) and interpersonal reasons (eg, to get help from someone, to let others change their mind) have been reported for self-harm and suicidal behaviour among non-pregnant adolescent girls in Ghana.^{14,15} Notably, only one recent study has estimated suicidal behaviour—a composite of ideation, planning, and attempt—among adult pregnant women in the Volta Region of Ghana (3.3%), with intimate partner abuse identified as the only factor associated with the increased odds of suicidal behaviour (adjusted odds ratio (aOR)=6.50, 95% CI 1.14 to 37.05).¹⁶

Besides offering initial evidence on suicidal behaviour (ideation and attempt) among pregnant adolescent girls in Ghana, broadly, the current study seeks to contribute evidence that simultaneously supports efforts towards achieving Target 3.1 of the United Nations Sustainable Development Goals, with the Specific Indicators 3.1.1 (to reduce the global maternal mortality ratio to less than 70 per 100 000 live births) and 3.4.2 (to reduce by one-third premature mortality from suicide) in Ghana. It is also anticipated that the evidence will inform further research and be informative for primary care providers, midwives

and obstetricians in monitoring and early identification of clinical manifestations, potential risk factors and actionable warning signs related to suicidal behaviours among pregnant adolescent girls presenting for antenatal care in Ghana. Specifically, the current study aims to:

1. Estimate the prevalence of suicidal ideation and suicide attempt among pregnant adolescent girls in Ghana.
2. Identify some of the commonly reported sociodemographic and psychosocial correlates of suicidal ideation and suicide attempt among pregnant adolescent girls in Ghana.
3. Describe the self-reported reasons for suicide attempt among pregnant adolescent girls in Ghana.

METHODS

Design, setting and participants

This study is reported following the community-agreed recommendations of Strengthening the Reporting of Observational Studies in Epidemiology.¹⁷ We adopted a cross-sectional survey design utilising an anonymous questionnaire. The target population comprised pregnant

adolescent girls in Ghana. Notably, while teenage pregnancy remains a concerning social and public health challenge in Ghana, reliable country-level statistics are unavailable. A cardinal reason for the unavailability of reliable, representative statistics on pregnant adolescents in Ghana (and sub-Saharan Africa in general) is that many of these girls do not attend antenatal clinics—where their data can be captured. Thus, we followed Cochran’s formula for calculating sample size for proportions, where the population size is unknown, to predetermine a (minimum) sample size of 422, including an additional 10% to provide for non-response or missing data.¹⁸ Furthermore, the 16 administrative regions of Ghana were regrouped into three broad geographical zones (northern/savannah, central/middle and southern/coastal), and 15 healthcare facilities were selected. **Figure 1** summarises the three-stage sampling process followed. In stage 1, five health facilities (where pregnant adolescent girls who seek professional care typically access antenatal and postnatal care) were selected from each geographical zone. In stage 2, the antenatal unit within

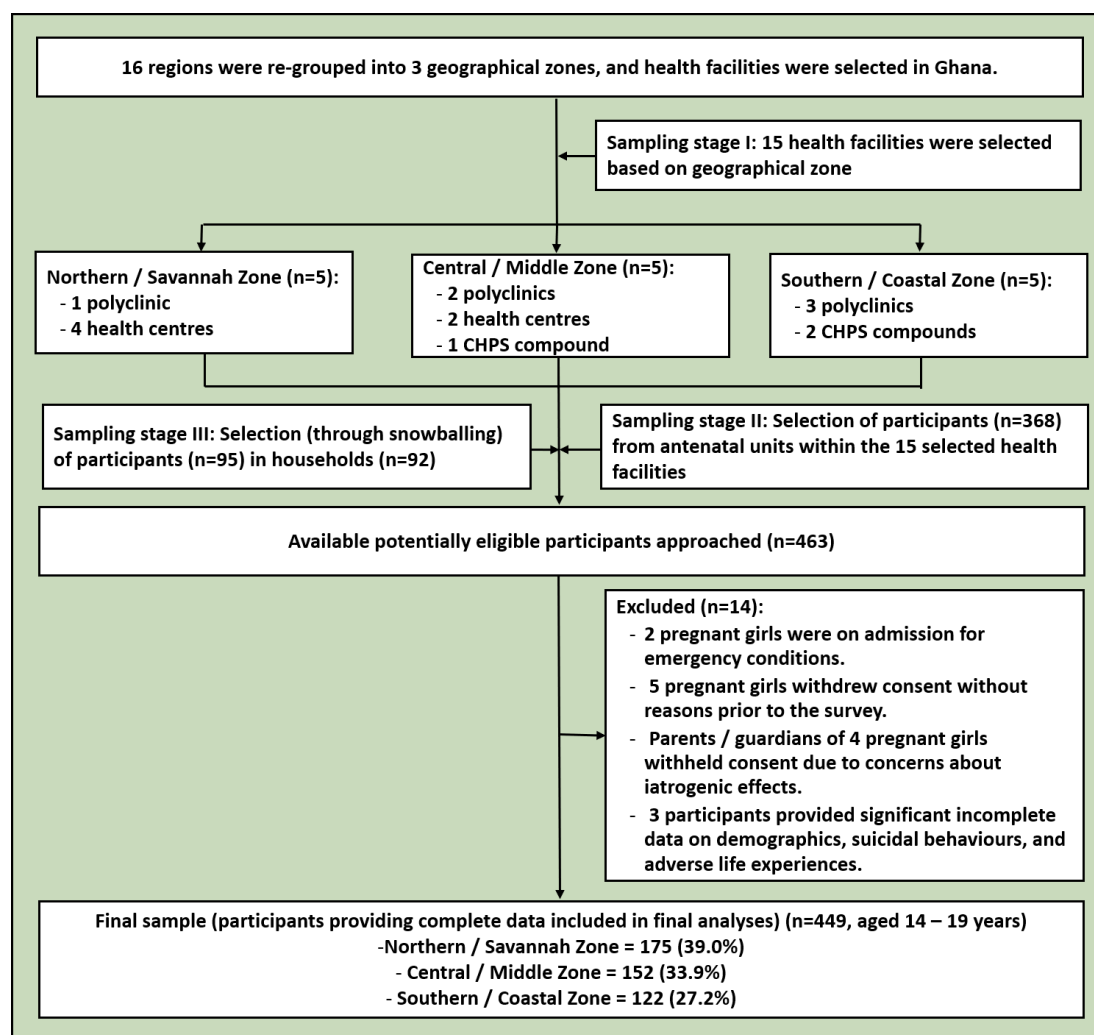


Figure 1 Flowchart summarising the process of participant recruitment. CHPS, Community-based Health Planning and Services.

Table 1 Inclusion and exclusion criteria of participants

Criterion	Inclusion criteria	Exclusion criteria
Age	▶ Pregnant adolescent girls aged between 13 and 19 years	▶ Pregnant women aged 12 years and younger, or those aged 20 years and older
Health and physical state	▶ Pregnant adolescent girls with no major mental or chronic health condition known to be a risk factor for suicidal behaviours	▶ Pregnant adolescent girls available to participate in the survey but have known major mental or chronic health conditions, including substance dependence or comorbid post-traumatic stress disorder (PTSD) ▶ Potential participants who are visibly ill or intoxicated with alcohol or another drug or substance
Service	▶ Pregnant adolescent girls accessing outpatient clinical services	▶ Pregnant adolescent girls presenting with emergency conditions, and pregnant adolescent girls on admission wards
Consent	▶ Pregnant adolescent girls willing to respond to the survey questions on previous suicidal behaviours and key socio-demographic variables	▶ Pregnant adolescent girls unwilling to participate in the survey or refuse to sign the consent or assent form ▶ Pregnant adolescent girls aged 17 years and younger who are unaccompanied by a significant other adult who can provide parental or guardian consent ▶ Pregnant adolescent girls aged 17 years and younger accompanied by a significant other adult who is unwilling to provide parental or guardian consent
Age of pregnancy/gestational age	▶ Adolescent girls whose current pregnancy is at least 2 weeks old	▶ Adolescent girls whose current pregnancy is <2 weeks old

each selected health facility was selected, and pregnant adolescent girls presenting for antenatal services were approached and invited to participate. Table 1 provides the eligibility criteria applied in the selection of participants. For example, potentially eligible pregnant adolescent girls must be aged between 13 and 19 years of age.

To ensure that participants who were not attending an antenatal clinic at the time of data collection were also represented and included in this study, stage 3 of the sampling process utilised the snowball approach. Participants recruited in stage 2 were asked to provide information facilitating the recruitment of other pregnant adolescent girls in their communities, neighbourhoods or households.

Ethics approval

Two Institutional Review Boards approved this study (Ghana Health Service Ethics Review Committee, and the Departmental Research and Ethics Committee, Department of Psychology, University of Ghana, Accra). Participants signed written consent prior to taking part in the survey. Parents/guardians of participants aged 17 years and younger also provided written consent, while their underage pregnant adolescent girls assented to participate. Permissions were sought from the management of the health facilities where participants were approached and recruited.

Variables and measures

This study utilised an anonymous questionnaire composed of sociodemographic factors (ie, age, gestational age, number of pregnancies, living arrangement,

marital status, educational background and religious background), outcome variables and exposure variables.

Outcome variables

Suicidal ideation and suicide attempt were assessed using the 4-item Suicide Behaviour Questionnaire-Revised (SBQ-R).¹⁹ The Cronbach's alpha score in the current study was 0.70. The internal consistency score of the SBQ-R is satisfactory (Cronbach's alpha=0.78) among adolescents and young adults in Ghana. Specifically, a single item of the SBQ-R ('During your current pregnancy, how often have you thought about ending your own life?') was used to assess suicidal ideation. Similarly, suicide attempt was evaluated using a single item: 'During your current pregnancy, how often have you ever attempted to end your own life?' Ratings of the responses to each item ranged from never=1, to very often (five or more times)=5. Responses were dichotomised (absence vs presence, for analysis). The 10-item checklist of frequently reported reasons for adolescent attempted suicide was used to assess participants' motivations/reasons for attempted suicide.²⁰ Previous evidence supports the application of this checklist in Ghana.¹⁵ Participants who reported attempted suicide in their current pregnancy also responded to the checklist of possible intentions that might have had major (scored 2), minor (scored 1) or no influence (score 0) on why they attempted suicide.

Exposure variables

Three broad categories of exposure variables were included—lifestyle, mental health and personal-level factors (eg, religious participation, alcohol use,

depression, help-seeking for mental health problems); family-level factors (eg, food insecurity, conflict with parents) and interpersonal-level factors (eg, intimate partner violence victimisation, intimate partner-accepted paternity).

Lifestyle, mental health and personal-level factors

The single item, 'In a typical week, how many times do you have at least one alcoholic drink?' was adopted from the 2012 World Health Organization–Global School-based Student Health Survey (WHO-GSHS) questionnaire used in Ghana²¹ and was used to assess alcohol use. Another single item, 'How often do you attend church or other religious meetings?' with response options ranging from 1 (never) to 6 (more than once per week) was adopted from the Duke University Religion Index to measure religious participation.²² Current unplanned or planned pregnancy was assessed using the item, 'How would you describe your current pregnancy: did you plan/intend it or you did not plan it?' (response options: unplanned (0), planned (1)). Pregnancy-related anxiety was measured using the 10-item pregnancy-related anxiety scale.²³ Pregnancy-related anxiety is conceptualised as the fears a pregnant woman has about her baby's health, her own health, and labour and delivery.²³ Items on this scale include, 'I have a lot of fear regarding the health of my baby'; response ratings range from 1 (never or not at all) to 4 (a lot of the time or very much). Total scores ranged from 10 to 40. Several scoring formats have been proposed for this scale; however, the current study applied a median cut-off score of ≥ 28 to dichotomise the total scores (a total score ≥ 28 represented high pregnancy-related anxiety). The Cronbach α coefficient for the pregnancy-related anxiety scale in the present study was 0.87.

The 5-item World Health Organization Well-Being Index (WHO-5) was used to assess depression.²⁴ WHO-5 is a 5-item, 6-score scale, from 'all of the time' to 'at no time' (eg, 'I have felt cheerful and in good spirits'), with the possible total score ranging from 0 to 25, which is multiplied by four to give the final score ranging from 0 to 100. As recommended by previous studies, a cut-off score of ≤ 50 on the WHO-5 was used to assign a 'screening diagnosis' of depression. The Cronbach α coefficient for this scale in the present study was 0.88. History of attempted suicide before current pregnancy was assessed using a binary response based (no/yes) single item: 'Have you ever attempted to end your own life before your current pregnancy?' Help-seeking for mental health problems during the current pregnancy was assessed using the actual help-seeking single item²⁵: 'During your current pregnancy, whom do you typically seek help from if you are experiencing personal or emotional problems?' The responses include, 'I don't seek help from anyone', and a list of help sources (eg, parents, friends/peers, teacher, counsellor, nurse). The responses were dichotomised into 0 ('I don't seek help from anyone') and 1 ('I seek help from someone'). A single item ('How satisfied are

you with your access to health services?') from the World Health Organization Quality of Life Scale - Brief Version (WHOQOL-BREF) was used to assess satisfaction with access to healthcare services.²⁶ The response ratings ranged from 1 (very dissatisfied) to 5 (very satisfied).

Family-level factors

A single item ('During the past 30 days, how many times did you go hungry because you were unable to afford two square meals per day?') was modified from the 2012 Ghana WHO-GSHS survey questionnaire to assess food insecurity (hunger) during the current pregnancy.²¹ Responses were dichotomised (no/yes). Conflict with parents during the current pregnancy was assessed with a no/yes item: 'During your current pregnancy, have you had any serious conflict or fights with one or both of your parents?' Adverse childhood experiences (ACE) were assessed with the 10-item Adverse Childhood Experiences scale.²⁷ In the current study, ACE is conceptualised as potentially traumatic events experienced in childhood between the ages of 1 and 12 years. Total scores on the ACE scale range from 0 to 10; a total score ≥ 4 is used as the cut-off, indicating the more ACE the respondent has had, the higher the risk for negative mental or social outcomes. The Cronbach's α coefficient for this scale in the present study was 0.82.

Interpersonal-level factors

Intimate partner acceptance of paternity was assessed with a no/yes item: 'Did your partner/husband/boyfriend accept responsibility for your current pregnancy?' Intimate partner violence victimisation during current pregnancy was also assessed using a no/yes item: 'During your current pregnancy, have you been hit, slapped, kicked or physically hurt by your husband, partner, boyfriend, ex-husband, ex-partner, ex-boyfriend or someone else you relate to intimately?' This item was adopted from the Abuse During Pregnancy Scale.²⁸ Current pregnancy resulting from rape was assessed with a no/yes item: 'Did your current pregnancy result from rape or sexual intercourse that happened against your will or consent?'

Procedure

As shown in figure 1, pregnant adolescent girls presenting to outpatient units of the antenatal care departments of the selected health facilities were approached and invited to respond to the self-report survey. For participants accessed in households, the survey was administered to the participants in safe and private spaces. Survey administration was carried out between August 2022 and December 2023. The questionnaire took between 16 min and 25 min to complete and was filled out by the respondent. Notably, to ensure uniformity of meaning, participants were informed that, in this study, suicide attempt was taken to mean any intentional non-fatal self-inflicted poisoning or injury with an intent to die as a result of the behaviour, and suicidal ideation was used to mean thoughts of engaging in suicide-related behaviour. Each

participant received GH¢50 (equivalent to US\$5) as compensation for their time spent in responding to the survey.

Data analysis

Univariable analysis was performed using frequencies and percentages to explore the distribution of key demographic factors across the data and to ascertain the reported reasons for attempted suicide and the prevalence estimates of suicidal ideation and suicide attempt. The Pearson's Chi-square (χ^2) and point-biserial correlation (r_{pb}) tests were used to examine the bivariate relations between the exposure variables and sociodemographic factors, and suicidal ideation and suicide attempt. Multivariable binary logistic regression was used to assess the correlates of suicidal ideation and suicide attempt. All the sociodemographic variables were included in the adjusted logistic models as covariates. Exposure variables and sociodemographic factors were included in the logistic regression models regardless of their statistically significant bivariate associations with the outcomes in order to avoid overfitting the models.²⁹ Notably, in the final adjusted logistic models, the exposure variable, Current pregnancy resulted from rape, was excluded due to insufficient cell frequency yielding very large ORs and CIs, thereby rendering the initial models invalid and unstable. Although the arbitrary statistical threshold of $p < 0.05$ partly informed the judgement of the statistical significance of results, we determined statistically significant results mainly based on the ORs and associated 95% CIs and the clinical importance of effect sizes observed.³⁰ Missing data were completely deleted using the list-wise approach, as the loss of cases due to the missing data was less than 5%. All data were analysed using SPSS (SPSS V.29.0 for Windows).

RESULTS

Overall, 463 potential participants were approached and invited to respond to the survey. Of these, 449 (aged 14–19 years; mean (standard deviation (SD))=18.00 (1.03)) provided complete data for the study—representing a response rate of 96.98%. While the majority (61.69%) of the participants identified as single/unmarried, 4.67% (95% CI 2.92% to 7.06%) reported that their pregnancy resulted from rape. Demographic characteristics of the participants and the distribution of exposure variables across the sample are shown in online supplemental e-table 1.

Prevalence of suicidal ideation and suicide attempt during current pregnancy

Of the total sample ($n=449$), 28.51% (95% CI 24.37% to 32.93%) reported suicidal ideation, and 18.04% (95% CI 14.59% to 21.91%) reported suicide attempt during the current pregnancy. Additionally, 11.80% (95% CI 8.97% to 15.15%) reported a history of attempted suicide before the current pregnancy. As shown in online supplemental

e-figure 1, the pooled prevalence estimates of suicidal ideation and suicide attempt across the three geographical zones showed no statistical difference—the estimates were similar and comparable.

Correlates of suicidal ideation and suicide attempt during current pregnancy

As shown in online supplemental e-table 2,3, several factors at the lifestyle, mental health, and personal level (eg, alcohol use, pregnancy-related anxiety, depression, history of attempted suicide, help-seeking for mental health problems and satisfaction with access to health-care service); family-level (eg, conflict with parents, food insecurity and adverse childhood experiences); and interpersonal-level (intimate partner violence victimisation, intimate partner accepted paternity and current pregnancy resulted from rape) showed strong bivariate associations with both suicidal ideation and suicide attempt (online supplemental e-table 3 presents the results of the point-biserial correlation tests).

Table 2 shows the results of the final adjusted logistic regression models assessing the correlates of suicidal ideation and suicide attempt. Food insecurity (aOR=2.69; 95% CI 1.34 to 5.41; $p=0.005$) was uniquely associated with increased odds of suicidal ideation. Adverse childhood experiences (aOR=3.04; 95% CI 1.33 to 6.97; $p=0.008$), history of attempted suicide before current pregnancy (aOR=3.47; 95% CI 1.27 to 9.47; $p=0.015$) and depression (measured by WHO-5; aOR=0.31; 95% CI 0.12 to 0.77; $p=0.012$) were uniquely associated with increased odds of suicide attempt. Five variables were commonly associated with increased odds of both suicidal ideation and suicide attempt: conflict with parents, alcohol use, pregnancy-related anxiety, history of attempted suicide and intimate partner violence victimisation. While being in junior high school (aOR=0.39; 95% CI 0.17 to 0.91; $p=0.029$) was uniquely associated with reduced odds of suicidal ideation, intimate partner accepted paternity of current pregnancy was commonly associated with reduced odds of both suicidal ideation and suicide attempt.

Reasons for the last episode of suicide attempt during the current pregnancy

Table 3 presents the reasons endorsed by the adolescent girls who reported attempted suicide during their current pregnancy. The participants endorsed multiple reasons for their last attempt at suicide. All the participants reporting attempted suicide ($n=81$) endorsed 'to die' as the reason: 35.8% endorsed it as a major reason, and 64.2% endorsed it as a minor reason. Twenty-seven participants (33.3%) endorsed 'to make people understand how desperate I was feeling' as a major reason. Taken together, in terms of major reasons, 40% of the participants reporting attempted suicide endorsed 'interpersonal reasons', 52.9% endorsed interpersonal reasons and 7.1% endorsed 'it was the work of the devil' as 'other reason' for their last episode of suicide attempt.

Table 2 Multivariable associations between exposure and outcome variables

Variables in the model	Suicidal ideation				Suicide attempt			
	β	aOR	95% CI	P value	β	aOR	95% CI	P value
Age	-0.08	0.92	0.67 to 1.26	0.609	0.23	1.26	0.83 to 1.92	0.285
Gestational age:								
1st trimester	Reference				Reference			
2nd trimester	-0.15	0.86	0.34 to 2.14	0.742	-0.71	0.49	0.16 to 1.51	0.215
3rd trimester	-0.16	0.85	0.37 to 1.92	0.693	-0.72	0.48	0.18 to 1.32	0.156
Number of previous pregnancies	-0.45	0.64	0.34 to 1.21	0.168	0.39	1.48	0.67 to 3.27	0.325
Living arrangement	0.43	1.55	0.68 to 3.53	0.300	-0.09	0.91	0.30 to 2.75	0.872
Marital status	-0.11	0.89	0.39 to 2.01	0.782	-0.74	0.48	0.16 to 1.44	0.191
Educational background:								
Primary school	Reference				Reference			
Junior high school	-0.93	0.39	0.17 to 0.91	0.029	-0.25	0.78	0.26 to 2.31	0.652
Senior high school	-0.75	0.47	0.21 to 1.07	0.072	-0.74	0.47	0.16 to 1.39	0.175
Religious group	0.21	1.23	0.55 to 2.77	0.616	0.53	1.71	0.58 to 5.01	0.331
Religious participation	0.22	1.24	0.91 to 1.69	0.166	0.14	1.16	0.79 to 1.70	0.454
Alcohol use	1.17	3.23	1.27 to 8.21	0.014	1.46	4.31	1.57 to 11.84	0.005
Pregnancy-related anxiety	0.53	1.71	0.91 to 3.19	0.094	0.94	2.58	1.16 to 5.77	0.021
Depression (measured by WHO-5)	-0.53	0.59	0.28 to 1.22	0.153	-1.17	0.31	0.12 to 0.77	0.012
History of attempted suicide before current pregnancy	0.71	2.04	0.84 to 4.95	0.116	1.24	3.47	1.27 to 9.47	0.015
Help-seeking for mental health problems	-0.17	0.84	0.31 to 2.26	0.732	-0.94	0.39	0.13 to 1.16	0.089
Satisfaction with access to healthcare service	-0.07	0.93	0.59 to 1.47	0.767	0.07	1.08	0.59 to 1.94	0.808
Current pregnancy unplanned/unintended or planned	0.02	1.02	0.46 to 2.27	0.951	0.39	1.49	0.54 to 4.08	0.441
Intimate partner accepted paternity	-1.97	0.14	0.07 to 0.27	<0.001	-0.83	0.44	0.19 to 0.96	0.040
Conflict with parents during current pregnancy	1.29	3.63	1.95 to 6.75	<0.001	1.28	3.61	1.66 to 7.85	0.001
Food insecurity during current pregnancy	0.99	2.69	1.34 to 5.41	0.005	0.55	1.74	0.70 to 4.29	0.231
Intimate partner violence victimisation during current pregnancy	0.96	2.62	1.15 to 5.96	0.022	0.99	2.69	1.09 to 6.67	0.032
Adverse childhood experiences	0.05	1.06	0.52 to 2.13	0.875	1.11	3.04	1.33 to 6.97	0.008

Statistically significant results are in boldface.

aOR, adjusted odds ratio; CI, confidence interval; WHO-5, the 5-item World Health Organization Well-Being Index; β , beta value.

DISCUSSION

Main findings

The current study is the first to examine the prevalence and correlates of suicidal ideation and suicide attempt and the reasons for attempted suicide among pregnant adolescent girls in Ghana. Nearly 2.8 out of 10 pregnant

girls reported suicidal ideation, and about 1.8 out of 10 reported suicide attempt during their current pregnancy. It is noteworthy that comparing the estimates of suicidal ideation and suicide attempt in the current study to the estimate of suicidal behaviour reported recently among adult pregnant women in the Volta Region of Ghana¹⁶ is

Table 3 Reasons for suicide attempt checked by pregnant adolescent girls (n=81)

Reason	Endorsed as major reason, n (%)	Endorsed as minor reason, n (%)	Endorsed as having no influence, n (%)
To die	29 (35.8)	52 (64.2)	–
To get relief from a terrible state of mind	38 (47.0)	28 (34.5)	15 (18.5)
To escape for a while from an impossible situation	34 (42.0)	37 (45.7)	10 (12.3)
To make people understand how desperate I was feeling	27 (33.3)	40 (49.4)	14 (17.3)
To make people feel sorry for the way they've treated me; frighten someone or get back at someone	23 (28.4)	38 (46.9)	20 (24.7)
To try to influence someone or get them to change their mind	19 (23.5)	46 (56.8)	16 (19.7)
To show how much I loved someone	23 (28.4)	23 (28.4)	35 (43.2)
To find out whether someone really loved me or not	25 (30.9)	44 (54.3)	12 (14.8)
To seek help from someone	15 (18.5)	53 (65.4)	13 (16.1)
Other (it was the work of the devil)	18 (22.2)	37 (45.7)	26 (36.1)

The major reasons 'I wanted to die', 'to get relief from a terrible state of mind' and 'to escape for a while from an impossible situation' were categorised as 'intrapersonal reasons' (40%).

The major primary reasons 'to make people understand how desperate I was feeling', 'to make people feel sorry for the way they've treated me; frighten someone or get back at someone', 'to try to influence someone or get them to change their mind', 'to show how much I loved someone', 'to find out whether someone really loved me or not' and 'to seek help from someone' were categorised as 'interpersonal reasons' (52.9%).

'It was the work of the devil' was categorised as 'other reason' (7.1%).

conceptually and practically impossible, as the authors, Kugbey and colleagues, defined and measured suicidal behaviour in their study as a composite of ideation, planning and attempt.¹⁶ Kugbey and colleagues failed to disaggregate the observed estimates in their study in terms of ideation, planning, and attempt.¹⁶

Even so, the estimates in the current study fall within the range of prevalence estimates of suicidal ideation and suicide attempt reported among adult pregnant women in some high-income countries—for example, the USA.⁶ But they are also comparable to estimates of suicide attempt among non-pregnant adolescent girls in Ghana.¹⁴ The prevalence estimate of suicidal ideation in the current study is relatively higher compared with the known estimate of suicidal ideation among non-pregnant adolescent girls in Ghana.¹⁴ Plausibly, this finding suggests that compared with non-pregnant adolescent girls, pregnant adolescent girls may be faced with many challenges that predispose them to thoughts of suicide—for example, high rate of dropping out of school, social stigma, major inequality of access to healthcare and household wealth.¹¹ Beyond this possibility, the finding also supports the growing body of evidence that the rates of suicidal ideation could be even higher among pregnant girls and women—thereby defying the popular perception that pregnancy may be protective against suicidal behaviour.⁶

The major evidence in the current study regarding correlates is less surprising but important: that family adversity (ie, conflict with parents), mental health challenges (ie, alcohol use, pregnancy-related anxiety and history of attempted suicide) and intimate partner violence victimisation show strong association with

increased odds of suicidal ideation and suicide attempt, while intimate partner accepted paternity is associated with reduced odds of both ideation and attempt.

Considering that most of the participants in the current study were single, conflict with parents is expected to have a strong association with the odds of both suicidal ideation and attempt. In the African cultural value system, the normative expectation is that unmarried adolescent girls and young women will develop into adult women and serve as social insurance to their (aged) parents, but more importantly, avoid pregnancy or childbirth out of wedlock. Becoming pregnant before marriage is considered a dishonour, a stigma and a disgrace to the family. Teenage pregnancy is a taboo in some African communities. Parents often interpret pregnancy out of wedlock as failed parenting, and this can potentially strain parent-adolescent relationships, leading to conflict between pregnant adolescent girls and their parents.¹³ Such conflict with parents can, in turn, lead to and increase the risk for depression, self-blame, self-hate, suicidal thoughts and self-directed harmful acts among pregnant adolescent girls.

The chances of conflict with parents can also be heightened in cases of adolescent pregnancy where the intimate partner refuses to accept paternity. Besides the social stigma, teenage pregnancy without known paternity can increase the economic burden on the parents or family of the pregnant girl, even after delivery. The girl's family must care for the young mother and her (unborn) baby. This can increase perceived burdensomeness—the belief on the part of the pregnant girl that she is a burden on her parents, guardians or family. Perceived burdensomeness

creates a desire for suicide. On the contrary, as shown in the current study, intuitively, it could be expected that where the intimate partner accepts paternity, the pregnant girl is likely to be less vulnerable to perceived burdensomeness and hopelessness, and the likelihood of conflict with parents diminishes. In other words, when the intimate partner accepts paternity, the chance of suicidal ideation and suicide attempt by a pregnant adolescent girl is reduced (although the effect size observed in the current study is relatively small).

Relatedly, adolescent-parent conflict and other familial or interpersonal adversities can also be associated with increased risk of risky health behaviours among adolescents, including alcohol use as a coping mechanism. Although the association of alcohol use with suicidal behaviour is well established in the suicidology literature, the cross-sectional nature of the current study makes it difficult to determine the role of alcohol use (whether as an exposure or an outcome variable) in the association. On the one hand, when ingested as a coping mechanism, alcohol use can disrupt the natural course of depression or other mood-related problems. It can cause a sudden dip in moods, which in turn can lead to suicidal ideation and self-harm tendencies. On the other hand, some people experiencing (intrusive) thoughts of suicide and self-harm resort to alcohol use as a distractive strategy—making alcohol use an outcome rather than an exposure variable. Beyond these, alcohol use is also known to impair judgement and self-regulation, which can elevate the risk of suicidal thoughts and attempts.

The association of pregnancy-related anxiety with increased odds of suicidal thoughts and attempts could be interpreted in relation to three observations in the current study: the young maternal age of the participants, the fact that most of the participants had an unplanned/unintended pregnancy, and the fact that most of the participants were pregnant for the first time (primigravida). Taken together, these factors tend to be associated with an increased risk of experiencing uncertainty and fear about pregnancy and delivery/birth.⁴ Future qualitative studies could nuance our understanding by exploring the living and lived experiences of how pregnancy-related anxiety may be associated with the risk of suicidal behaviour among this young population.

Regardless of the population, a history of attempted suicide represents the strongest risk for current and future suicidal behaviour.^{1,4} Perhaps this finding in the current study could be pointing to the influence of undiagnosed or untreated mental health issues or unresolved psychosocial challenges underlying previous attempts at suicide. Possibly, this finding underscores the need to prioritise the imperative role of mental health and psychosocial support screening of pregnant adolescent girls.

The plethora of evidence from recent research in both high-income countries and LMICs suggests that intimate partner violence victimisation has telling effects on the mental and physical health of girls and women—whether pregnant or not.⁷ Without timely intervention, intimate

partner violence victimisation can lead to depression among pregnant women, which in turn elevates the risk for both antepartum and postpartum suicidal ideation, suicide attempt and suicidal deaths.^{4,6} While the recommendation for screening of intimate partner violence during pregnancy remains contested, what is clear is that screening accompanied with accessible, effective intervention yields (mental) health-promotive outcomes among antepartum and postpartum women.

The majority of the participants in the current study who reported attempted suicide during the current pregnancy endorsed the intention ‘to die’ as a minor reason for their last attempt at suicide. This could support the evidence from Ghana that some adolescents who engage in self-harm do so as a communicative act—a ‘cry for help’ in anticipation of support and rescue by significant others.¹⁵ Similarly, the finding that most participants in the current study endorsed more interpersonal reasons (eg, to communicate distress, to seek help or to influence others) than intrapersonal reasons (eg, to die, to attain emotional or cognitive relief) as a major influence for their attempted suicide also supports previous evidence from Ghana and sub-Saharan Africa that the intention to change multiple interpersonal strictures and adversities tends to influence suicidal behaviour among young people.^{13,15}

Limitations

A noteworthy strength of this study is that it is the first study from Ghana that attempts to select a nationally representative sample of pregnant adolescent girls in a self-reported survey on antepartum suicidal behaviour. Thus, this study serves as an informative point of departure for more expansive studies on antepartum suicidal behaviour among this young female population not only in Ghana but also in other sub-Saharan African countries. Even so, some notable limitations of this study are identified. The one-time cross-sectional design did not allow for causal interpretations of the results. The authors applied single-item measures to assess suicidal ideation and suicide attempt, which could be less elaborative and less encompassing in capturing all the critical dimensions and nuances of suicidal ideation and suicide attempt in young people. Future studies could consider applying multi-item measures (with satisfactory psychometric properties) to contribute further contextually relevant evidence. Relatedly, including several dichotomised data in this study might have led to imprecise results in the logistic regression models. In the current study, all the participants utilised antepartum clinical services—even those who were identified and approached through snowballing in households. This implies that while the evidence of the current study may apply to pregnant adolescent girls who attend antepartum clinical services, the findings may not necessarily apply to pregnant adolescent girls who do not use antepartum services in Ghana. Similarly, the lack of a comparison group of non-pregnant adolescent girls from the same or similar sociodemographic backgrounds

(even in the published literature from Ghana) makes the comparative discussion of the key findings less nuanced.

Implications

The key findings of the current study underscore several implications for policy and clinical practice aimed at improving the mental health of pregnant adolescent girls in Ghana. Most importantly, the government of Ghana, in collaboration with its international development partners (eg, WHO, the United Nations Population Fund, the United Nations Children's Fund) and other global and local key stakeholders (including families), must strengthen the drive towards the prevention of teenage pregnancy and child marriage in Ghana.^{10 11}

The key evidence of the current study also highlights a need for routine antepartum primary care mental health screening for suicidality and intimate partner violence and related risks. Antepartum visits present an opportunity for comprehensive screening and treatment regimens for risky health behaviours (eg, alcohol use) and symptoms of depression, suicidal tendencies and related comorbidities among pregnant adolescent girls. Relatedly, given the critical frontline role that midwives play in the provision of antepartum and postpartum care, there is a need to develop curricula with content regarding the mental health of pregnant girls and women for midwifery trainees and professionals, medical students, general nursing trainees, obstetrics and psychiatric residents and practising obstetricians and psychiatrists. This way, frontline professionals with the requisite skills and knowledge can carefully monitor and identify potential risk factors, associated clinical manifestations and actionable signs of both antepartum and postpartum suicide; they can also provide meaningful maternal mental health support services to pregnant adolescent girls presenting for antepartum or postpartum care.

The evidence of the current study underscores a need for policy frameworks that promote the quality of life for pregnant adolescent girls within the lens of health (access) equity. This includes advocating for comprehensive sexual and reproductive health education programmes that are accessible to all adolescent girls, enhancing their ability to form healthy relationships and recognise signs of abuse. Additionally, interventions should aim to strengthen family and community support systems, creating family environments that foster open communication, understanding and protection against intimate partner violence.

Future studies (eg, those using robust qualitative designs) could include the voices of pregnant adolescent girls who are living with suicidal ideation or have survived antepartum suicide attempt to inform and nuance our understanding of the shared and individualised meanings, first-hand accounts, disclosure of suicidal behaviour, intimate partner violence victimisation and professional (mental health) help-seeking. Evidence from such future studies would also benefit clinical practice and policy and inform intervention, prevention and mental

health promotion training programmes for professionals (clinicians and teachers), families and young pregnant mothers.

Although the prevalence estimates of attempted suicide in this study are comparable to known rates among other adolescent groups, particularly non-pregnant adolescent girls in Ghana, the rates of suicidal ideation in the current study are relatively higher. Additional research is needed to explore and nuance our understanding of the correlates identified in this study. The evidence also highlights a need for both routine antepartum primary care mental health screening for suicidality and related risks and targeted prevention and intervention programmes.

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