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Depression among pregnant teenagers receiving antenatal care from primary healthcare facilities in Mbarara city, Southwestern Uganda

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Abstract

Background Depression is a serious mental health condition whose risk is highest among women during pregnancy. The risk is high among pregnant teenagers due to intertwined developmental, hormone-mediated physical and psychosocial changes of pregnancy, with significant negative impacts on the unborn baby and the mother. This study aimed to determine the prevalence of depression and associated factors among pregnant teenagers in Mbarara city, southwestern Uganda.

Methods This was a cross-sectional study where we enrolled pregnant teenagers (13–19 years) attending antenatal care at 4 selected lower healthcare facilities in Mbarara City southwestern Uganda. We collected information on depression, resilience, social support and household food insecurity. Depression was defined as a score > 10 on the Edinburgh Postnatal Depression Scale (EPDS). Resilience was assessed using the 14-item Wagnild and Young Resilience Scale, Multi-dimensional Scale of perceived social support (MDSPSS) assessed perceived social support, and Household Food Insecurity Access Scale (HFIAS) assessed food insecurity in addition to sociodemographic variables. We run logistic regression analysis to determine factors associated with depression.

Results A total of 373 participants were recruited; median age was 19 (IQR: 18–19) years, 59% attained primary level education. The prevalence of depression was 35.9% (95% CI: 31.1% to 41.0%). Factors significantly associated with depression were current alcohol use (aOR = 1.98, 95% CI: 1.18 – 3.32, $p = 0.010$), and food insecurity (aOR = 2.24, 95% CI: 1.25 – 4.01, $p = 0.006$). Factors that reduced the odds of depression included resilience (aOR = 0.93, 95% CI: 0.91 – 0.97, $p = 0.001$) and family social support (aOR = 0.94, 95% CI: 0.88 – 0.99, $p = 0.031$).

Conclusions and recommendations In this study the prevalence of depression among pregnant teenagers was significantly high. Mental health services should be integrated in the antenatal care clinics to address the mental health needs of pregnant teenagers. We recommend further studies to explore the lived experiences focusing on the challenges and further understanding of their coping strategies and other possible confounders of depression. In addition, longitudinal studies should be conducted to establish the temporal relationships between the different factors related to depression to support intervention studies that promote the mental health of young mothers.

Keywords Depression, Pregnant teenagers, Resilience, Alcohol use, Food insecurity, Social support, Uganda

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Introduction

Depression is a serious mental health condition that is characterized by persistent feelings of sadness, hopelessness, low mood, loss of interest or pleasure in activities that were once enjoyable [1]. Sometimes it may be associated with physical symptoms such as fatigue, changes in appetite and sleep patterns which impair daily activities of affected individuals [2, 3]. Women are more likely to experience depression, especially in low-and middle-income countries (LMICs), compared to high-income countries (HICs) [4]. The risk of depression is higher during pregnancy due to hormone-mediated physical and psychological changes that affect the neurophysiology of the brain [5]. Among teenage mothers, the physiological changes of pregnancy and the impending motherhood role compounds the pre-existing developmental challenges of adolescence, increasing the risk of depression [6]. Teenage pregnancy and mental health challenges present a *double vulnerability* to adverse outcomes for both the teen mother and the unborn child [7].

East Africa has been identified as having one of the highest rates of teenage pregnancies globally given the dense population of young people in this setting [8]. Globally, depression affects 16% to 44% of pregnant teenagers [9]. Varying prevalences of depression among pregnant teenagers have been reported in sub-Saharan Africa ranging from 55.8% in southwest Nigeria, 44.3% from rural South Africa and 43.1% in Kenya [10–12]. In a recent systematic review the pooled prevalence of depression among postpartum or pregnant women (including pregnant teenagers) in Uganda was 26.9% [4].

Factors that have been found to increase the likelihood of depression among pregnant teenagers include history of physical and sexual abuse, exposure to domestic and intimate partner violence, stigma and negative cultural perception of teenage pregnancy, low socioeconomic status, prior history of mental health problems, and difficulties in healthcare access [12, 13]. Additionally, lack of social support and poor coping mechanisms like alcohol and substance abuse have been associated with depression among pregnant teenagers in high income countries [14]. Depression during teenage pregnancy has a significant impact on both the mother and the developing fetus [5]. For the mother, there is a heightened risk for post-partum depression and obstetrics complications including preterm labour, antepartum, and postpartum hemorrhage [15–17]. The fetus may be at-risk of impaired fetal development which results into intrauterine growth restriction, low infant birth weight, and early life adversities resulting into long-term cognitive and emotional problems later in the life of the offspring [15–17].

Despite the multitude of negative factors contributing to depression among pregnant teenagers and the fact that Africa records almost twice the global prevalence of teenage pregnancies, there is scarcity of literature about depression among pregnant teenagers which impedes efforts to address this problem in these settings [18]. This study aimed to determine the prevalence of depression and associated factors among pregnant teenagers receiving antenatal care services at selected healthcare facilities in Mbarara city, southwestern Uganda.

Methods

Study design

This was a cross-sectional quantitative study among pregnant teenagers attending antenatal care in selected health facilities within Mbarara city, southwestern Uganda.

Study setting

The study was conducted from May 28, 2024 to Aug 2, 2024 at 4 primary health care facilities in Mbarara city, which offer high-risk antenatal services (ANC), as per the Ugandan Ministry of Health (MOH) guidelines [19]. Mbarara city is approximately 270 km (170 miles), by road, to the southwest of Kampala, Uganda's capital city. The selected health facilities included Mbarara Municipal Council Health Centre IV, Kakoba Health Centre III (HC III), Biharwe HC III and Nyakayojo HC III. In Uganda, provision of antenatal services to pregnant teenagers in public institutions starts at health centre III (HC III) which is at sub-county level, with subsequent referrals to health centre IV at the county level, district hospitals, regional referral hospitals, and finally to the national referral hospital where specialized high-risk antenatal services are provided.

From the 2021/2022 annual antenatal records of Mbarara city, it was found that Mbarara Municipal Council Health Centre IV receives the highest number of teenage mothers annually (302 teenagers) followed by Kakoba HC III (180 teenagers), then Biharwe HC III (139 teenagers). The high numbers of pregnant teenagers have been attributed to cultural practices, including early marriages and related risky sexual practices in the region, compounded by low socioeconomic status and illiteracy about existing sexual and reproductive services [20].

Eligibility criteria

Inclusion criteria

We enrolled pregnant teenagers aged 13 to 19 years who were receiving antenatal care (ANC) at the selected health facilities and who were willing to provide written informed consent for participation in the study.

Exclusion criteria

We excluded those who were in need of emergency intervention (e.g. severe pre-eclampsia in hypertensive crisis,

per vaginal bleeding, altered level of consciousness) and those with communication impairments, as well as those unable to provide consent.

Sample size estimation

Sample size was determined using the Kish Leslie formula and based on prevalence estimates of depression rates of 32.9% among pregnant teenagers in Nairobi, which was assessed with a similar tool (Edinburgh Postnatal Depression Scale) to the one used in this study [21]

$$n = \frac{Z^2 P(1-P)}{e^2}$$

$$n = \frac{1.96^2 0.329(1-0.329)}{0.05^2} = 339 + 10\%\ \text{non} - \text{response rate} = 373\ \text{participants.}$$

where; $\boldsymbol{n}$ is the sample size, $\boldsymbol{Z}$ is standard normal distribution of 1.96 which corresponds with 95% confidence level, $\boldsymbol{p}$ is 32.9%; the prevalence of depression among pregnant teenagers in Kenya [21], **e** is the allowable margin of error of 0.05. We added a 10% non-response rate, making the final sample size of 373 participants.

Sampling procedure

Pregnant teenagers were recruited using consecutive sampling. After their routine clinical assessment and management, participants were approached and given information about the purpose of the study. Those who provided written informed consent were included in the study. Sampling was done proportionately to the number of patients enrolled at the specific health facility.

Study variables

Dependent variable

The dependent variable was depression using the Edinburgh Postnatal Depression Scale (EPDS) [22].

Independent variables

The independent variables were factors that have been identified in the literature to be associated with depression among pregnant teenagers. These included sociodemographic characteristics, pregnancy-related factors, and psychosocial factors [1, 11, 23–25].

Sociodemographic factors included age (in complete years), geographical location (rural, urban), level of education (none, primary, secondary, tertiary), marital status (currently in an intimate relationship, not currently in an intimate relationship), employment status (employed, unemployed), and HIV status (negative, positive). Pregnancy-related factors included gravidity, parity, gestational age (in weeks), number of antenatal care (ANC) visits, conception circumstances (consensual, commercial, *or* rape). The psychological factors included the family history of mental illness (yes, no), current use of alcohol use (yes, no), perceived social support, resilience, and food insecurity.

Study measures

Depression was assessed using the Edinburgh Postnatal Depression Scale (EPDS) [22]. The EPDS is a 10-item instrument originally used to screen depression among postnatal women. It has been used widely in sub-Saharan Africa for comprehensive screening of depression symptoms during pregnancy among adolescents, and has shown good and reliable psychometric properties [26]. Each item is responded to on a 4-point Likert scale ranging from 0 to 3. Items 3, 5, 6, 7, 8, 9, 10 are reverse scored (3 to 0). The total score is determined by adding together the scores for each of the 10 items, producing a sum score range from 0 to 30, with higher scores indicating increased severity of depressive symptoms. In this study, pregnant teenagers who scored 10 and above were considered depressed [25]. Depression was categorized into 4 categories depending on the total scale scores as follows: no depression (0 to 6), mild depression (7 to 13), moderate depression (14 to 19) and severe depression (20 to 30). The Cronbach alpha of the scale in the present study was 0.87.

Social support was assessed using the multi-dimensional scale of perceived social support (MDSPSS) (Zimet et al., 1988). The MDSPSS is a 12-item measure of perceived adequacy of social support from three sources: family, friends, and significant others. The MDSPSS is scored on a 7-point Likert-type scale ranging from 1(strongly disagree) to 7 (strongly agree) giving a total minimum score of 12 and a total maximum score of 84 with higher scores indicating greater perceived social support. The scale has 3 subscales: "Family subscale" (items 3, 4, 8 and 11), "Friends subscale" (items 6, 7, 9 and 12) and "significant others subscale" (items 1, 2, 5 and 10). The MDSPSS has been validated for use in Uganda where it demonstrated good internal consistency, reliability, and validity [27]. Among pregnant teenagers, the total Cronbach's alpha of the MDSPSS reported at 0.80, while Cronbach's alpha coefficients for family, friends and significant others subscales were 0.81, 0.88 and 0.92 respectively [28]. For the present study, the Cronbach alpha coefficients for

family, friends, and significant other subscales and total scale were 0.89, 0.91, 0.80, and 0.87 respectively.

Resilience was screened using the 14-item Wagnild and Young Resilience Scale (RS) which has been used among pregnant teenagers in Africa [29]. The scale is rated on a 7-point Likert type scale (1 = strongly disagree to 7 = strongly agree) with summed scores ranging from 14 to 98 where higher scores reflect higher resilience. Based on standard classification, the summed scores were categorized into levels of resilience as follows: low (≤ 64), moderate (65–81) and high (≥ 82) [30]. A prior study in Nigeria reported good reliability of the scale among pregnant teenagers with a Cronbach's alpha of 0.80 [29]. In this study, the scale had a Cronbach alpha of 0.89.

Food insecurity was assessed using the 9-item Household Food Insecurity Access Scale (HFIAS). This scale addresses the frequency in the previous 4 weeks with which any household member experienced anxiety and uncertainty of food access, inadequacy of food quality, insufficient food intake or hunger [31, 32]. Responses are coded based on the frequency of occurrence with **0** meaning "*never* (0 times)", **1** meaning "*rarely* (1–2 times)", **2** meaning "*sometimes* (3–10 times)", and **3** meaning "*often* (11 + times)" with a total score ranging from 0 to 27. It has been used in Uganda to differentiate between food secure and food insecure households with good reliability [33]. In the present study, the scale had a Cronbach alpha of 0.85.

Data collection and management

Data collection was done using the Kobo Collect Toolbox. Data was collected by two research assistants who had received training in responsible conduct of research and data collection techniques. The study participants were approached one at a time after receiving their ANC package. Research assistants administered the interviewer-administered questionnaire to the participant. The principal investigator settled any mishaps in data at the end of each data collection day. All data entered was stored on google cloud with a backup copy on a password protected computer of the principal investigator.

Quality control

The research data collection tools and consent forms were translated from English to the local language (Runyankole/Rukiga) and back-translated to English to ensure consistency. Research assistants were fluent in both English and Runyankore, and were trained on how to administer the questionnaire, how to ask sensitive questions, and ethical conduct of research before data collection started. Participants who were found to have significant distress (those whose psychological state causes impairment in social, occupational, or other important areas of daily functioning) were referred for evaluation and management at the psychiatry department of Mbarara regional referral hospital.

Data analysis

Data were imported into STATA version 17 for data cleaning and analysis [34]. Continuous variables were summarized using means and standard deviations (if normally distributed), and median and interquartile rage (if non-normally distributed). Categorical variables were summarized as frequencies and percentages. The Shapiro-Wilks test and histograms were used to assess normality under the Gaussian assumption. Our outcome variable was depression, defined as scores of 10 and above on the Edinburgh Postnatal Depression Scale. Logistic regression models were run to determine factors associated with depression among pregnant teenagers. Following bivariate analysis, only factors that are biologically plausible (consistent with known biological mechanisms) and statistically significant were considered for the final multivariable model. This was done to avoid model overfitting and to improve model parsimony. All analysis was done at 95% confidence interval considering the level of significance to be less than 0.05.

Results

Study characteristics of the participants

A total of 373 participants were recruited in the study with a median age of 19 years and interquartile range of 18 to 19 years. Over half of participants, 220 (59%), had attained primary education level, the majority were unemployed, 248 (66.5%), and over a-quarter, 100 (26.8%), were not in currently in an intimate relationship (Table 1).

Regarding the conception circumstances of pregnant teenagers, the majority had conceived following a consensual intercourse, 303 (82.6%) whereas 10 (2.7%) of the teenagers conceived through rape. It is also important to note that almost three quarters 273 (73.2%) were prime gravidas, in their second trimester 189 (50.7%).

Only 40 (10.7%) reported a positive family history of mental illness and 150 (40.2%) were currently drinking alcohol. Participants living with HIV were 20 (5.4%) and over two-thirds 236 (63.3%) were experiencing food insecurity. On the other hand, about three quarters 277 (74.3%) were moderately to highly resilient, and derived perceived social support mostly from significant others with highest median score of 23 and interquartile range of (20, 24) (Table 1).

Prevalence of depression among pregnant teenagers

The prevalence of depression among pregnant teenagers was 35.9% (95% CI: 31.1% to 41.0%). More specifically,

Table 1 Study characteristics of pregnant teenagers ($N = 373$)

Study characteristics	Frequency (%) or Mean ± SD or Median (IQR)
Name of the health facility	
Biharwe HC III	19 (5.1%)
Kakoba HC III	28 (7.5%)
Mbarara Municipal council HC IV	315 (84.5%)
Nyakayojo HC III	11 (2.9%)
Sociodemographic factors	
Age (in complete years)	19 (18, 19)
Level of education	
None	20 (5.4%)
Primary	220 (59.0%)
Secondary	124 (33.2%)
Tertiary	9 (2.4%)
Employment status	
Employed	125 (33.5%)
Unemployed	248 (66.5%)
Marital status	
Not currently in an intimate relationship	100 (26.8%)
Currently in an intimate relationship	273 (73.2%)
Pregnancy related factors	
Conception circumstances	
Consensual	308 (82.6%)
Commercial	55 (14.7%)
Rape	10 (2.7%)
Prime gravidas	
No	100 (26.8%)
Yes	273 (73.2%)
Trimester	
First trimester	63 (16.9%)
Second trimester	189 (50.7%)
Third trimester	121 (32.4%)
Psychological factors	
Family history of mental illness	
No	333 (89.3%)
Yes	40 (10.7%)
Currently drinking alcohol	
No	223 (59.8%)
Yes	150 (40.2%)
HIV status	
Negative	353 (94.6%)
Positive	20 (5.4%)
Food insecurity	
No	137 (36.7%)
Yes	236 (63.3%)
Total resilience score	70.22 ± 10.21
Resilience categories	
Low resilience (≤ 64)	96 (25.7%)
Moderate resilience (65 to 81)	230 (61.7%)
High resilience (≤ 82)	47 (12.6%)
Perceived social support scale	
Overall total social support score	58 (51, 64)
Family subscale	20 (17, 23)
Friends' subscale	16 (10, 20)
Significant others subscale	23 (20, 24)
Depression	
No	239 (64.1%)
Yes	134 (35.9%)

HIV/AIDS Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome, *IQR* Interquartile range, *SD* standard deviation

174 (46.6%) participants had no depression, 122 (32.7%) had mild depression, 49 (13.1%) had moderate depression and only 28 (7.5%) were considered to have severe depression.

Factors associated with depression among pregnant teenagers

Using bivariate logistic regression analysis, factors that reduced the likelihood of depression among participants included age (Crude OR (cOR) = 0.70, 95% CI: 0.55–0.90, $p = 0.006$), having attained secondary level of education (cOR = 0.33, 95% CI: 0.13–0.88, $p = 0.026$), being in a current intimate relationship (cOR = 0.50, 95% CI: 0.31–0.80, $p = 0.004$), being in secondary trimester of pregnancy (cOR = 0.53, 95% CI: 0.30–0.95, $p = 0.034$), resilience (cOR = 0.92, 95% CI: 0.89–0.94, $p < 0.001$), perceived social support from family (cOR = 0.88, 95% CI: 0.85—0.93, $p < 0.001$), and perceived social support from significant others (cOR = 0.84, 95% CI: 0.79–0.89, $p < 0.001$).

Alternatively, factors that increased the likelihood of depression included being unemployed (cOR = 1.81, 95% CI: 1.13—2.89, $p = 0.013$), having conceived through commercial sex (cOR = 2.61, 95% CI: 1.45–4.67, $p = 0.001$) or rape (cOR = 5.06, 95%: 1.28–20.05, $p = 0.020$), positive family history of mental illness (cOR = 2.71, 95% CI: 1.39–5.27, $p = 0.003$), current use of alcohol (cOR = 1.97, 95% CI: 1.28–3.04, $p = 0.002$), and experiencing food insecurity (cOR = 3.84, 95% CI: 2.32–6.36, $p < 0.001$).

Using multivariable logistic regression analysis, factors associated with increased likelihood of depression included current use of alcohol during pregnancy (aOR = 1.98, 95% CI: 1.18—3.32, $p = 0.010$), and experiencing

food insecurity (aOR = 2.24, 95% CI: 1.25—4.01, p = 0.006).

Factors that were associated with lower odds of depression were resilience (aOR = 0.93, 95% CI: 0.91—0.97, p = 0.001) and perceived social support from their family (aOR = 0.94, 95% CI: 0.88—0.99, p = 0.031) (Table 2).

Discussion

In the present study, the prevalence of depression among pregnant teenagers was 35.9%. Current alcohol consumption and food insecurity were associated with increased odds of depression, whereas resilience and family social support were associated with lower odds of depression among pregnant teenagers.

Our study found the prevalence of depression at 35.9% among pregnant teenagers, which was higher than the 15.9% reported in South Africa and 17.7% as reported in Nigerian pregnant teenagers [35, 36]. Both studies used the Edinburgh Postnatal Depression Scale (EPDS) which has been psychometrically validated for assessing depression among adolescent mothers [22]. However, both studies used higher cut off scores (EPDS ≥ 12 and ≥ 13 respectively), which is high compared to the cut off of 10 we used in this study [35, 36]. Higher cut-offs are likely to exclude many teenagers which may be lead in underestimation of depression. In addition to the above, the high prevalence of depression among pregnant teenagers could be due to the socioeconomic challenges and diverging cultural beliefs that may lead to social stigma and isolation that worsen mental health outcomes [24].

However, our prevalence of depression was slightly lower than the 43.1% reported among pregnant teenagers in two Nairobi county primary health care facilities [12] where the Patient Health Questionnaire-9 (PHQ-9) was used to screen for depression, a tool that has not been psychometrically validated among pregnant teenagers. The prevalence of depression in our study was further lower than 44.3% prevalence of probable depression among South African teenagers during both pre-natal and post-natal periods, where only 38.3% of teenage mother were prenatal with the majority being post-natal mothers [11]. The varying burden of teenage pregnancy could be due to differences in health care access, accessibility to education to healthcare [37].

Factors that increased the likelihood of depression among pregnant teenagers in this study were current use of alcohol and food insecurity. According to the World Health Organization, no amount of alcohol is safe during pregnancy due to high risk for birth defects and developmental disabilities [38]. Teenage girls who use alcohol before pregnancy are likely to continue using it throughout their pregnancy and after delivery [39]. There is vast evidence on the relationship between alcohol use and higher depression symptom severity among the general population [40]. This is likely worse among pregnant teenagers due to specific complex social, psychological, and cultural challenges [41]. Therefore, pregnant teenagers often use alcohol as a coping mechanism, as has been documented in similar studies in sub-Saharan Africa [11],.

We also found that food insecurity was associated with higher odds of having depression. There is evidence from existing research that food insecurity is the greatest risk factor for maternal mental health problems in Africa [31, 36, 42, 43]. Pregnant teenagers face unique nutritional demands required for their body to develop in order to keep up-to-pace with physical and physiological demands of pregnancy to provide sufficient nutrients for fetal development [43]. Therefore, inability to meet such demands due to food insecurity may result in psychological distress and subsequent depression [42].

Further findings in our study showed that adequate perceived social support was associated with lower odds of having depression. This finding echoes findings of previous studies in both low and high-income settings that clearly indicate that the presence of social support from friends, partners, and family reduces the risk of all mental health conditions associated with teenage pregnancy [44–47]. Studies among teenage mothers in South Africa have qualitatively explored social support during pregnancy, where it has been found to provide emotional security, thus improving their overall mental health [48]. This stems from the behavioral response of the partner and family after disclosure of the pregnancy [48]. Studies among South African young mothers have concluded that sufficient social support from immediate networks have been found to increase the pregnant teenager's potential to embrace the pregnancy changes [49]. In addition, adequate perceived social support has been found to improve maternal mortality rates and increase reproductive health access worldwide [48]. For instance, one study among 352 pregnant teenagers in Mexico found good quality of social support provided by blood relatives in a given family was associated with positive maternal and fetal outcomes, including maternal mental health and child birth weight [50].

Further, we found that resilience was associated with lower odds of depression. Resilience denotes one's ability to bounce back from an adversity, and encompasses individual concepts like inner strength, competence, flexibility and self-esteem [23]. Pregnant teenagers face a variety of stressful circumstances related to pregnancy and impending motherhood and this psychological burden may result in physical and mental incapacity with maternal and fetal consequences [29, 51]. Resilience has been found to improve healthcare access among young

Table 2 Logistic factors for factors associated with depression among pregnant teenagers

Study characteristics	Bivariate logistic regression		Multivariable logistic regression	
	Crude OR (95% CI)	*p*-value	Adjusted OR (95% CI)	*p*-value
Sociodemographic factors				
Age	0.70 (0.55—0.90)	0.006	0.95 (0.67—1.36)	0.795
Level of education				
None	Reference		Reference	
Primary	0.50 (0.20—1.25)	0.136	0.97 (0.31—3.09)	0.964
Secondary	0.33 (0.13—0.88)	0.026	1.09 (0.32—3.78)	0.886
Tertiary	0.65 (0.13—3.19)	0.600	2.56 (0.38—17.0)	0.330
Employment status				
Employed	Reference		Reference	
Unemployed	1.81 (1.13—2.89)	0.013	1.40 (0.79—2.46)	0.244
Marital status				
Not currently in an intimate relationship	Reference		Reference	
Currently in an intimate relationship	0.50 (0.31—0.80)	0.004	1.39 (0.72—2.67)	0.328
Living parents				
Both live	Reference			
Both deceased	1.11 (0.42—2.93)	0.827		
Father only lives	1.03 (0.39—2.67)	0.955		
Mother only lives	1.33 (0.79—2.23)	0.285		
Pregnancy related factors				
Conception circumstances				
Consensual	Reference		Reference	
Commercial	2.61 (1.45—4.67)	0.001	1.42 (0.67—3.02)	0.357
Rape	5.06 (1.28—20.05)	0.020	1.17 (0.19—7.18)	0.864
Prime gravidas				
No	Reference			
Yes	0.94 (0.58—1.51)	0.793		
Trimester				
First trimester	Reference		Reference	
Second trimester	0.53 (0.30—0.95)	0.034	0.62 (0.31—1.26)	0.188
Third trimester	0.72 (0.39—1.33)	0.295	0.98 (0.46—2.08)	0.965
Number of antenatal care visits so far	0.99 (0.86—1.13)	0.859		
Psychological factors				
Family history of mental illness				
No	Reference		Reference	
Yes	2.71 (1.39—5.27)	0.003	2.03 (.92—4.45)	0.078
Currently drinking alcohol				
No	Reference		Reference	
Yes	1.97 (1.28—3.04)	0.002	1.98 (1.18—3.32)	0.010
HIV status				
Negative	Reference			
Positive	1.85 (0.75—4.56)	0.183		
Food insecurity				
No	Reference		Reference	
Yes	3.84 (2.32—6.36)	< 0.001	2.24 (1.25—4.01)	0.006
Resilience	0.92 (0.89—0.94)	< 0.001	0.93 (0.91—0.97)	< 0.001
Perceived social support scale				
Family support	0.88 (0.85—0.93)	< 0.001	0.94 (0.88—0.99)	0.031
Support from friends	0.96 (0.93–1.00)	0.052	1.02 (0.97—1.07)	0.481
Support from significant other	0.84 (0.79—0.89)	< 0.001	0.96 (0.89—1.04)	0.351

mothers even when they experience stigma and negative stereotypes from healthcare providers with associated improvement in their mental health [52]. It has been reported that women with high resilience are more inclined to use positive coping strategies to pregnant-related stress like seeking out for social support, self-care and staying away from harmful environments [52]. This has been associated with better mental health and symptom reduction among those with mental illnesses (depression, anxiety) [53].

Our study findings should be interpreted in considering the following limitations. Firstly, our study was conducted among pregnant teenagers from within Mbarara city, thus the findings may not be generalizable to apply to other pregnant teenagers in Uganda, which has diverse cultures. Secondly, the study was cross-sectional in nature, which limits our ability to determine causal relationships. Thirdly, the estimates in the study might have been affected by misclassification bias due to nature of self-report measures. Lastly, other potentially stressful life events that were not assessed are potential confounders that might influence the social support and resilience levels of the teenage mothers.

Conclusions and recommendations

Notwithstanding the above limitations, this study found a significantly high prevalence of depression among pregnant teenagers and that current alcohol consumption and food insecurity were associated with increased odds of depression, whereas family social support and resilience were associated with lower odds of depression in this vulnerable population. To improve mental health outcomes among pregnant teenagers, mental health services should be integrated into routine antenatal care. The availability of mental health services in the antenatal clinics will also help in addressing other compounding factors like alcohol use. Further studies among pregnant teenagers are recommended to qualitatively explore the lived experiences of teenage pregnancy focusing on the challenges and further understanding of their coping strategies (whether positively or negatively). Other possible confounders of depression in this population like domestic violence should be explored in future studies. Longitudinal studies should be conducted to establish the temporal relationships between the different factors related to depression to support intervention studies that promote the mental health of young mothers.

Abbreviations

ANC Antenatal Ccare
LMICs Low and Middle Mncome Countries
EPDS Edinburgh Postnatal Depression Scale
PHQ-9 Patient Health Questionnaire-9
HFIAS Household Food Insecurity Access Scale

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Authors' contributions

All authors made substantial contributions to the manuscript. Conception and design: MM, SO, and DM. Acquisition of data: MM, SA, and SO. Analysis and interpretation of data: MM and SO. MM and SO wrote the first draft of the manuscript. MM, SO, DM, and PL took part in critically revising the manuscript for important intellectual content; and all authors agreed to submit to the current journal; gave final approval of the version to be published; and agreed to be accountable for all aspects of the work.

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Data availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

We confirm that all methods used in this study were conducted as according to the World Medical Association Decleration of Helsinki [54]. We obtained ethical approval from the Mbarara University of Science and Technology Research Ethics Committee (Approval number: MUST-2023–1232). We also obtained administrative clearance from the Uganda National Council for Science and Technology (HS3913ES), the Mbarara city health offcier and the health facility in-charges. All participants provided written informed consent before participating in the study. Participation was volunatry and participants had the right to withdraw from the study at any point without any consequences whatsoever.

Information collected was anonymissed with codes and kept private. In cases of disclosed ongoing abuse (like sexual abuse, physical abuse, e.t.c), participants were linked to the social worker at the referral mental health facility who intitiated the required legal processes where necessary in consultation with the pregnant teenager victim.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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