

Factors Associated with Repeat Teenage Pregnancy in Refugee Settlements in Uganda

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Background: Repeat teenage pregnancy is a global issue affecting low-, middle-, and high-income countries, with significant risks for both the mother and child. Despite the high prevalence of repeat teenage pregnancy in refugee or internally displaced persons camps, there are limited data on the phenomenon, particularly among teenage mothers residing in refugee settlements. We determined the prevalence and factors associated with repeat teenage pregnancies among teenage mothers in refugee settlements in Northern Uganda.

Methods: We performed a secondary analysis on data from a cross-sectional descriptive study conducted on conveniently sampled adolescent girls aged 15–19 years, from Bidi Bidi and Palorinya refugee settlement camps in Northern Uganda. Cluster sampling techniques, where each settlement represented one cluster was used. The prevalence of repeat teenage pregnancies was assessed by self-reported number of pregnancies of more than one. We performed multivariable logistic regression on all variables with $p < 0.2$ to assess for factors independently associated with repeat teenage pregnancy.

Results: We included 131 participants with a median age of 18 (IQR: 18 to 19) years, the median age of sex debut was 16 (Range: 13–18), years, and 60.3% ($n=79$) were married. The prevalence of repeat teenage pregnancy was 24.4% ($n=32$). No factor was seen to be independently significant at the multivariable level.

Conclusion: The study reveals a 24.4% rate of repeat teenage pregnancies among girls in northern Uganda's refugee settlements. This prevalence shows a significant public health challenge, particularly in humanitarian contexts where access to reproductive health services is limited. While no specific independent risk factors were identified, bivariate analysis linked male-headed households and cohabitation with increased risk. These findings suggest that male-headed households and cohabitation may influence reproductive decision-making or access to contraception, potentially due to power dynamics or socio-cultural norms.

Keywords: adolescents, teenagers, teenage pregnancy, repeat teenage pregnancy

Introduction

Repeat teenage pregnancy, defined as more than one pregnancy in a girl who is 13–19 years of age, represents one of the most critical and intractable challenges in adolescent sexual and reproductive health.¹ This age range is critical as it aligns with the World Health Organization's definition of adolescence, a period marked by significant physical, emotional, and social development, making teenagers particularly vulnerable to reproductive health challenges.² Repeat teenage pregnancy has been associated with an increased risk of preterm birth, low birth weight, stillbirths, and perinatal and neonatal mortality above and beyond the first pregnancy,^{3,4} with the increased likelihood of depression and behavioural disorders.⁵ Beyond these immediate obstetric risks, repeat teenage pregnancies perpetuate intergenerational cycles of poverty, school dropout, mental health disorders, and economic dependence, often trapping young mothers and their children in long-term disadvantage.^{6–8} In humanitarian settings, these consequences are amplified by disrupted education, weakened health systems, and heightened exposure to sexual and gender-based violence.⁹

The prevalence and trends of repeated teenage pregnancies vary around the world, and it is linked to poverty, unemployment, higher levels of income inequality, lower high school graduation rates, fewer publicly funded family planning clinics per capita, and more women receiving contraceptive services at publicly funded clinics.¹⁰ In middle-income countries such as Thailand, Brazil, and the Philippines, repeat teenage pregnancy ranges from 18.1% to 53.5%.¹¹

Although it is lower in African settings, this may be due to data limitations. Rates from 4.82% to 55.6% have been reported in sub-Saharan Africa, with Uganda and Kenya having the highest rates at 55.6% and 30.4%, respectively,^{12,13} while Gabon, Tanzania, and South Africa have lower rates of 20.93%, 18.8% and 4.82%, respectively.¹⁴

People, especially women and young girls living in refugee settlements, are vulnerable to sexual violence due to conflicts, insecurity, violence and poverty.⁹ These populations often face unique challenges, including limited access to education, healthcare, and economic opportunities, which exacerbate their vulnerability to early and repeat pregnancies.^{9,15} With over 1.5million refugees in Uganda, mostly from South Sudan and the Democratic Republic of Congo, of which women and children constitute 81%,¹⁶ it is imperative that teenage and repeat teenage pregnancy may be a problem, as reported elsewhere.¹⁷ Even with the available protections from the government of Uganda, United Nations agencies and international Non-Governmental Organizations (NGOs),¹⁶ Sexual and Gender Based Violence (SGBV) related to conflict and displacement are heightened by alcohol and substance abuse, limited access to sexual and reproductive health and rights (SRHR) information and services, and education and livelihood opportunities. This exposes refugee adolescent girls to risks of child marriage, sexual exploitation and abuse, among others. Sexual violence, exploitation, abuse as well as forced early marriages are prevalent in such settings.^{9,18} Poverty, limited access to education and healthcare, and cultural norms surrounding gender and sexuality^{19–21} remain a significant contributor to teenage and repeat teenage pregnancies in refugee settlements or displaced persons camps.¹⁷

West Nile region has the highest concentration of refugee settlement camps in Uganda, with a refugee population of 626,331¹⁶ and has been reported to have the highest rates of teenage pregnancies (New Vision, 2023).

Repeat pregnancies among teenage girls in refugee settlements present a concerning trend with profound implications for both the individual and community well-being. Teenage girls have a high risk of repeat pregnancy being driven by many other factors.²² Understanding the burden and factors contributing to repeat teenage pregnancies among teenage girls in refugee settlements is essential for designing targeted interventions aimed at breaking these cycles and improving the overall health and well-being of the affected populations. This study therefore seeks to contribute to this understanding by exploring the factors associated with and prevalence of repeat pregnancies among teenagers in refugee settlements in Northern Uganda.

Methods

Study Design

We conducted a community-based, cross-sectional descriptive study, adopting quantitative techniques between March and May 2023. Participant flow diagram is presented in [Figure 1](#).

Study Setting

This study was conducted in Palorinya and Bidi Bidi refugee settlements of the West Nile region, Northern Uganda. According to data from the Office of the Prime Minister (OPM) and United Nations Higher Commissioner for Refugees (UNHCR), Uganda is now home to 1,622,738 refugees living in 13 refugee settlements across the country, and almost half (6) of these are in the west Nile region.¹⁶ This setting was chosen because it hosts the biggest number of refugee settlements, proposed to provide a big pool of potential respondents for sampling.

Study Population and Sample Size

Our study targeted teenage girls living in the refugee settlements of Northern Uganda. This population is predominantly from South Sudan and the Democratic Republic of Congo, facing challenges such as poverty, limited access to education and healthcare, and exposure to sexual and gender-based violence, all of which increase their risk of repeat pregnancies. We included female refugees between 15 and 19 years old, who consented to our study, and those who were too ill to respond to

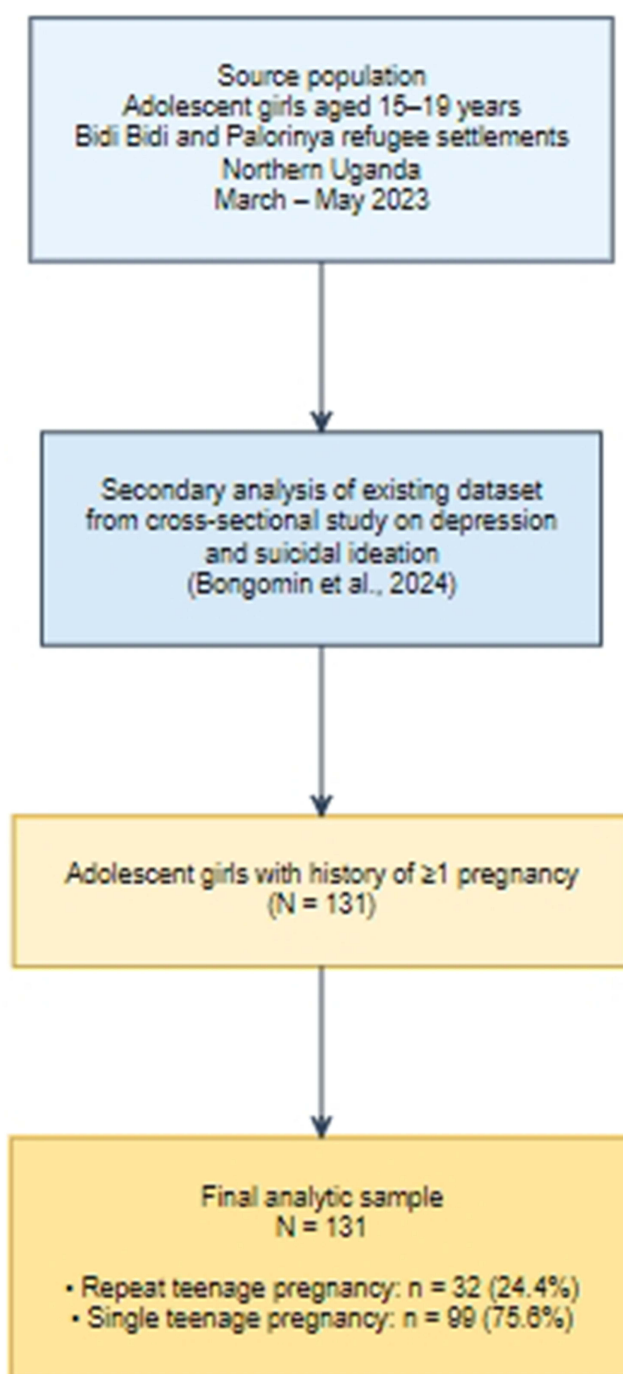


Figure 1 Participant flow diagram for secondary analysis of repeat teenage pregnancy in refugee settlements, Northern Uganda.

our study were excluded. The age range of 15–19 was chosen to focus on older adolescents who are more likely to have experienced pregnancy and to align with previous studies on teenage pregnancy in similar settings. This was a secondary analysis of data from a bigger study that explored depression and suicidal ideations among the same population, detailed methods for sampling, research instruments, and data collection procedure have been presented elsewhere.²³ Briefly, we conducted a combined sampling technique of cluster random sampling to select Bidi Bidi and Palorinya refugee settlements and convenience sampling to select participants within the clusters. A semi-structured questionnaire with open and closed-ended questions was developed in English, Arabic, and local languages (eg, Juba Arabic, Bari) and administered

electronically using the Kobo toolbox. To ensure validity and reliability across languages, the questionnaire was translated by bilingual experts, back-translated, and pre-tested among a small group of adolescents in a nearby settlement. In this secondary analysis, we included a total of 131 participants with a history of previous pregnancies as reported elsewhere.²³

Study Variables

Independent Variables

The study explored independent variables such as socio-economic factors (eg, household income, occupation, education level), socio-cultural factors (eg, marital status, cultural norms around early marriage), and individual factors (eg, age at sexual debut, history of sexual or physical abuse, peer influence). These variables were selected based on the socio-ecological model, which posits that individual, interpersonal, and community-level factors influence reproductive health outcomes. We hypothesized that lower socio-economic status, early marriage, and experiences of abuse would increase the likelihood of repeat teenage pregnancies.

Dependent Variables

The dependent variable explored by this study was repeated teenage pregnancy, defined as self-reported pregnancies of more than one in girls aged 15–19 years. This was measured by asking participants to report the number of pregnancies they had experienced, with repeat pregnancy defined as two or more pregnancies.

Data Management

The phone devices that were used to collect data were safely kept the devices under key and lock before and after data collection, and limited access. Participants were approached through community leaders and health workers, and interviews were conducted in private settings to ensure confidentiality. Research assistants underwent a two-day training session covering data collection ethics, questionnaire administration, and use of the Kobo Toolbox platform. We exported the data into STATA version 15, from which the analysis was done. Repeat teenage pregnancy was measured by self-reported number of pregnancies more than one. We performed Pearson's chi-square and Fisher's exact tests at bivariate analysis. We then performed a modified Poisson regression analysis for variables with $p < 0.2$ to assess for associations. The level of significance was set at $p < 0.05$.

Results

General Characteristics of 131 Teenage Girls Living in Refugee Settlements of Northern Uganda

Table 1 summarizes the general characteristics of 131 teenage girls living in refugee settlements in northern Uganda. The median age was 18 (IQR: 18 to 19), years and 98.5% were Christians, 102 (77.8%) had attained primary education as the highest level, 77.9% were not working, median monthly income was 0 (IQR: 0 to 10,000), Uganda shillings, 65.6% of household heads were male, and 60.3% of household leads were husband/spouse.

Overall, the median age of sex debut was 16 (Range: 13–18), years, sexual abuse was reported by 13.0% of respondents, meanwhile, physical abuse was reported by 61.1% of respondents, 68.7% of teenage girls experienced peer influence and alcohol consumption was reported by 18.3% of respondents.

Among the teenage girls, 33.6% had ever used modern contraceptives in their lifetime, 19.9% received contraceptive counselling from home, and 76.3% had ever been health educated on the dangers of teenage pregnancy, 68.7% were married, of whom 36.7% were forced/arranged.

Repeat Teenage Pregnancy

The prevalence of repeat teenage pregnancy was 24.4% (95% CI: 17.34 to 32.70), with a median of 1, and range of 1 to 3.

Table 1 General Characteristics of Respondents

Variable	Frequency	Percentage
Age , median (IQR), years	18	18-19
Religion		
Christian	129	98.5
Muslim	2	1.5
Occupation		
Working	29	22.1
Not working	102	77.9
Average monthly income , median (IQR), Ugx	0	0 – 10,000
Education		
No education	5	3.8
Primary	102	77.8
Secondary and beyond	24	18.4
Sex of Household head		
Female	45	34.4
Male	86	65.6
Relationship to the household head		
Parent	43	32.8
Relative	9	6.8
Husband/Spouse	79	60.3
Peer influence		
Yes	90	68.7
No	41	31.3
History of Contraceptive Use		
Yes	44	33.6
No	87	66.4
Living with both Parents		
Yes	65	49.6
No	66	50.4
Home sexuality education		
Yes	34	26.0
No	97	74.0
Home contraceptive use counseling		
Yes	26	19.9
No	105	80.1
Health education on the dangers of teenage pregnancy		
Yes	100	76.3
No	31	23.6

(Continued)

Table 1 (Continued).

Variable	Frequency	Percentage
Sexual abuse		
Yes	17	13.0
No	114	87.0
Physical abuse		
Yes	51	61.1
No	80	38.9
Alcohol Consumption		
Yes	24	18.3
No	107	81.7

Abbreviation: IQR, Interquartile Range.

Factors Associated with Repeat Teenage Pregnancy Among the Participants

Table 2 summarizes the factors associated with repeat teenage pregnancy among girls living in refugee settlements of northern Uganda.

At the bivariate level, factors such as: male sex of household head (PR: 2.3, 95% CI: 1.00–5.12, $p = 0.049$) and living with a spouse/husband (PR: 2.8, 95% CI: 1.17–6.86, $p = 0.021$) were associated with repeat teenage pregnancy among study participants.

We performed modified Poisson regression for factors independently associated with repeat teenage pregnancy among girls living in refugee settlements of northern Uganda. No factor remained significantly associated with repeat teenage pregnancy among study participants.

Table 2 Factors Associated with Repeat Teenage Pregnancy Among the Participants

Variable	All (N=131) Freq (%)	Repeat Teenage Pregnancy		Crude PR (95% CI)	P value	Adjusted PR (95% CI)	P value
		Yes (n=32) Freq (%)	No (n=99) Freq (%)				
Occupation							
Working	29 (98.5)	4 (13.8)	25 (86.2)	1			
Not working	102 (77.9)	28 (27.5)	74 (72.5)	1.9 (0.76–5.23)	0.163	1.9 (0.72–4.82)	0.196
Education							
No education	5 (3.8)	2 (40)	3 (60)	1.9 (0.51–7.27)	0.337	N/A	
Primary	102 (77.8)	25 (24.5)	77 (75.5)	1.2 (0.50–2.76)	0.709		
Secondary and beyond	24 (18.4)	5 (20.8)	19 (79.2)	1			
Sex of Household head							
Female	45 (34.4)	6 (13.3)	39 (86.7)	1		1	
Male	86 (65.6)	26 (30.2)	60 (69.8)	2.3 (1.00–5.12)	0.049	1.2 (0.46–3.19)	0.695
Relationship to household head							
Parent	43 (32.8)	5 (11.6)	38 (88.4)	1		1	
Relative	9 (6.8)	1 (11.1)	8 (88.9)	1.0 (0.12–7.28)	0.965	0.8 (0.11–5.81)	0.838
Husband/Spouse	79 (60.3)	26 (32.9)	53 (67.1)	2.8 (1.17–6.86)	0.021	2.7 (0.97–7.28)	0.056

(Continued)

Table 2 (Continued).

Variable	All (N=131) Freq (%)	Repeat Teenage Pregnancy		Crude PR (95% CI)	P value	Adjusted PR (95% CI)	P value
		Yes (n=32) Freq (%)	No (n=99) Freq (%)				
Peer influence							
No	90 (68.7)	7 (17.1)	34 (82.9)	1			
Yes	41 (31.3)	25 (27.8)	65 (72.2)	1.6 (0.76–3.46)	0.207	N/A	
History of Contraceptive Use							
Yes	44 (33.6)	11 (25.0)	33 (75.0)	1.0 (0.55–1.96)	0.914	N/A	
No	87 (66.4)	21 (24.1)	311 (75.9)	1			
Living with both Parents							
Yes	65 (49.6)	14 (21.5)	51 (78.5)	1			
No	66 (50.4)	18 (27.3)	48 (72.7)	1.3 (0.69–2.33)	0.449	N/A	
Home sexuality education							
Yes	34 (26.0)	11 (32.4)	23 (67.7)	1.5 (0.81–2.77)	0.203	N/A	
No	97 (74.0)	21 (21.7)	76 (78.3)	1			
Home contraceptive use counseling							
Yes	26 (19.9)	8 (30.8)	18 (69.2)	1.3 (0.68–2.65)	0.390	N/A	
No	105 (80.1)	24 (22.9)	81 (77.1)	1			
Health education on dangers of teenage pregnancy							
Yes	100 (76.3)	25 (25.0)	75 (75.0)	1.1 (0.53–2.32)	0.787	N/A	
No	31 (23.6)	7 (22.6)	24 (77.4)	1			
Sexual abuse							
Yes	17 (13.0)	4 (23.5)	13 (76.5)	1			
No	114 (87.0)	28 (24.6)	86 (75.4)	1.0 (0.42–2.62)	0.927	N/A	
Physical abuse							
Yes	51 (61.1)	12 (23.5)	39 (76.5)	1			
No	80 (38.9)	20 (25.0)	60 (75.0)	1.1 (0.57–1.98)	0.849	N/A	
Alcohol Consumption							
Yes	24 (18.3)	3 (12.5)	21 (87.5)	1			
No	107 (81.7)	29 (27.1)	78 (72.9)	2.1 (0.72–6.56)	0.171	2.0 (0.60–6.68)	0.256

Discussion

Repeat teenage pregnancy is a sexual and reproductive health challenge with a global magnitude. The factors influencing repeat teenage pregnancies in different settings are multifactorial. We used the socio-ecological model to guide our exploration of factors, hypothesizing that socio-economic (eg, poverty, low education), socio-cultural (eg, early marriage), and individual (eg, early sexual debut) factors interact to influence repeat pregnancies. We found out that 24.4% of teenage girls living in refugee settlements in northern Uganda experienced repeat teenage pregnancies. This prevalence is significant in the context of public health, as it indicates a high burden of repeat pregnancies that can exacerbate maternal and neonatal health risks, perpetuate poverty, and strain limited healthcare resources in humanitarian settings. Our observed prevalence of 24.4% aligns with recent estimates from non-refugee Ugandan settings, where repeat adolescent pregnancies affect 26–30% of young mothers in southwestern regions,²⁴ and exceeds the 16.7% reported in South Africa²⁵ and 12.2% in Cameroon,²⁶ 18.8% observed in Tanzania's general adolescent population.¹⁴ This elevated rate in

Uganda's refugee settlements likely reflects the compounded effects of displacement-related disruptions, including breakdown of community protection mechanisms, loss of parental oversight, and severely constrained access to long-acting contraception and postpartum family planning services amid ongoing influxes of over 65,500 Sudanese refugees since 2023.²⁷ The prevalence of repeat teenage pregnancy in refugee settlements of northern Uganda is comparable to the national average of teenage pregnancy according to the 2023 UDHS. However, the UDHS does not give information specific on repeat teenage pregnancy, especially, among special populations like teenage girls living in refugee settlements. Additionally, data drawn from the 2011 UDHS showed that 74% and 37% had experienced a rapid repeat pregnancy within 24 months and 12 months, respectively.²⁸ Notably, this study included women from 15 to 22 years, which explains the comparatively higher statistics compared to our study, which only included adolescent girls. Furthermore, our study was conducted among a special population, as compared to the other studies. Our findings were higher than those observed in refugee settlements of Ethiopia which found that up to 11.9% of girls experienced repeat teenage pregnancy.²⁹ The closeness of findings in the two studies highlights the urgency of the need for interventions geared towards addressing the challenges associated with repeat teenage pregnancies in refugee settings. Increasing the uptake of long-acting contraceptive methods, and encouraging post-partum long-acting modern contraceptive methods uptake in these settings will help to address the challenges of repeat teenage pregnancies and address the unmet need for family planning.

Our study did not identify any factor as independently associated with repeat teenage pregnancies among girls living in refugee settlements of northern Uganda. This could be because our study was conducted among a unique population, and, the small sample size included in this analysis. The multifactorial nature of teenage pregnancy suggests that factors such as poverty, cultural norms, and limited access to contraception interact in complex ways. A similar study conducted among teenage girls living in refugee settlements in Ethiopia highlighted forced/arranged marriages as an important factor associated with repeat teenage pregnancy.³⁰ Conversely, we did not find forced/arranged marriages to be independently associated with repeat teenage pregnancy in our study. Forced/arranged marriages, however, highlight the issues around sociocultural practices of early marriages and early sexual debut in refugee settings. The alarming rate of repeat pregnancies among adolescent girls trapped in forced child marriages emphasizes the urgent necessity for tailored interventions in addressing this challenge. It is only imperative that we hold accountable the perpetrators of such acts against the girl child, demanding strict justice from the appropriate authorities. This therefore necessitates a multi-sectoral collaboration and approach involving the legal authorities and human rights networks in addressing this challenge, signifying their contribution to the health sector.

The role of peer influence remains relevant and warrants further exploration in understanding adolescent reproductive health behaviours within refugee settlements. The importance of peer influence in teenage girls' sexual and reproductive health issues was emphasized in Nigeria,³¹ and in Northern Uganda.³² However, our study did not provide evidence of the role of peer influence in repeat teenage pregnancies among girls living in refugee settlements in northern Uganda. Nevertheless, to truly address the pressing challenges faced by teenagers, there is a need to empower them to be part of the solution. This means creating programs that actively engage young people in addressing their issues. Especially on the sensitive issue of sexual and reproductive health and rights, the active involvement of young girls is essential. Incorporating teenagers as peer counsellors who disseminate information on sexual and reproductive health is crucial in lowering the statistics of repeat teenage pregnancy.³³ This involvement ensures that solutions are relevant and effective meanwhile fostering a sense of ownership and empowerment, especially among teenage girls.

At the bivariate level, male-headed households and living with a spouse were associated with repeat teenage pregnancies. These factors may reflect power imbalances within households, where male heads or spouses may limit girls' access to contraception or influence reproductive decisions, potentially driven by socio-cultural expectations around early childbearing. These associations strongly suggest that gendered power imbalances play a central role in contraceptive decision-making and fertility outcomes, particularly in refugee contexts where economic dependence on male partners exacerbates girls' vulnerability to coercive reproductive control.³⁴ Qualitative evidence from South Sudanese refugees in Uganda reveals that husbands and male household heads often oppose contraceptive use, citing desires for large families or distrust of modern methods, while broader protection risks affect women disproportionately amid underfunded services.¹⁷ Such dynamics intersect with displacement stressors, amplifying repeat pregnancies through limited autonomy over sexual and reproductive choices.³⁵ Interventions must therefore extend beyond individual-level education to engage men and boys via community dialogue, couple counseling, and

male champion programs – approaches that have reduced repeat pregnancy rates and boosted contraceptive uptake in non-refugee Ugandan districts.³⁶ These findings suggest a need to explore gender dynamics and household structures in future studies. To address the inherent challenges of confounding and reverse causation in observational studies like ours, future research could incorporate advanced causal inference methods such as Mendelian randomization (MR), which leverages genetic variants as instrumental variables to infer causality while minimizing bias from unmeasured confounders.³⁷ Recent MR applications in reproductive epidemiology have demonstrated its utility in elucidating causal pathways, for instance, linking early age at first sexual intercourse and age at menarche to increased risks of teenage pregnancy and related behavioural outcomes.^{38,39} In humanitarian contexts, integrating MR with large-scale genomic data from diverse populations could help explain the interplay of genetic predispositions, socioeconomic stressors, and environmental exposures driving repeat teenage pregnancies, paving the way for more robust, targeted interventions. Our findings contribute to the growing body of literature on adolescent reproductive health in humanitarian settings and provide valuable insights for policymakers, healthcare providers, and humanitarian organizations working to address the unique needs of adolescent girls in refugee contexts. Breaking the cycle of repeat teenage pregnancy in these settlements demands simultaneous action on service delivery, gender norms transformation, and male engagement-actions that, if implemented comprehensively under frameworks like the Uganda Gender-Based Violence Strategy (2021–2025),⁴⁰ can yield intergenerational benefits for refugee communities and host nations alike.⁴¹

Limitations

Firstly, the cross-sectional design of our study limits causal inference. Longitudinal studies are needed to establish temporality and causality between the identified factors and repeat teenage pregnancy outcomes. However, the cross-sectional nature allowed us to capture a snapshot of the current prevalence and associated factors, providing valuable baseline data for future research. Secondly, the reliance on self-reported data may introduce recall and social desirability biases, potentially influencing the validity of our findings. Despite this, the use of self-reported measures enabled us to gather personal and sensitive information directly from the participants, which is crucial for understanding the complex dynamics of repeat teenage pregnancy in refugee settlements. Lastly, the small sample size and use of convenience sampling may limit the generalizability of our findings, given the diverse refugee populations in Uganda. This limited sample size and resulting low statistical power are the most likely explanations for the null findings at the multivariable level, despite suggestive associations observed in bivariate analysis. Future studies with larger, more representative samples are needed to expound these findings.

Conclusion

This study highlights a notable prevalence of repeat teenage pregnancy among girls living in refugee settlements of northern Uganda, with a rate of 24.4%. Despite the multifactorial nature of teenage pregnancy, our findings indicate that no specific factors were independently associated with repeat pregnancies in this unique population. Being in a household headed by a male, and living together with spouse, was shown to be a risk to having a repeat teenage pregnancy at bivariate analysis and this warrants further investigations with larger sample sizes. The study contributes valuable insights into the reproductive health dynamics in refugee settings, emphasizing the urgent need for comprehensive strategies to mitigate the risks of repeat teenage pregnancies.

Data Sharing Statement

The datasets used and/or analysed during the current study are available from the first author (Donald Otika) on reasonable request.

Ethics Approval and Consent to Participate

We obtained ethical approval Gulu University Research and Ethics Committee (approval number: GUREC-2022-291), which was presented to the District Health Offices (DHO) of the settlement host districts, to seek administrative clearance. We presented the introductory letter from the DHO to the Refugee Welfare Council 2 (RWC2) of selected refugee settlements to seek entry into the community and commence data collection. The study was conducted in accordance to the Declaration of Helsinki. A private and comfortable room was acquired and used during the process of data collection to ensure privacy and confidentiality.

Written informed consent was obtained from respondents who were 18 or 19 years old. For respondents under 18, a written informed assent was obtained from a parent or guardian, who also consented to allow their child to participate in the study. Participation was free and voluntary. Participants were assured of their freedom to withdraw from the study at any time with no penalty. Confidentiality of the information collected was observed using numbers and not names.

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Author Contributions

Felix Bongomin and Pebalo Francis Pebolo are joint senior authors. All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors of this manuscript declare no competing interests in this research work.

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