European Journal of Clinical Medicine
Vol 5 | Issue 3 | June 2024
ISSN 2736-5476

RESEARCH ARTICLE

Determinants of Prenatal Depression in Teenage Pregnant Women: A Comparative Study of Urban and Rural Settings in Lusaka Province, Zambia

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ABSTRACT

***Background*: Perinatal depression manifests during or after pregnancy, with prenatal depression occurring during pregnancy. Traditionally, research has focused more on postpartum depression, with less attention on prenatal depression among teenagers.**

***Objective:* This study aims to examine the correlates of prenatal depression among teenage pregnant women aged 13 to 17 and to explore the relationship between these factors and depression.**

***Methods*: A cross-sectional study was conducted at a university teaching hospital and a rural health facility, involving 105 pregnant teenagers. Initial screenings to assess depression were performed using the Edinburgh Postnatal Depression Scale, complemented by psychosocial evaluations with the Perceived Stress Scale and the Rosenberg Self-Esteem Scale. Data analysis was carried out using SPSS version 20, employing both descriptive and inferential statistical methods to interpret the findings.**

***Results*: Significant factors influencing prenatal depression included attempts to abort, stress, social support, household income, education level, and marital status. Logistic regression confirmed the significance of these correlates.**

***Conclusion*: Multiple factors influence prenatal depression in teenage pregnant women. The findings highlight the need for targeted preventive care and early interventions by medical professionals to improve health outcomes for mothers and infants.**

Keywords: Perinatal mental health, Prenatal depression, preventive mental healthcare, teenage pregnancy.

Submitted: April 26, 2024

Published: June 07, 2024

10.24018/ejclinicmed.2024.5.3.337

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1. Introduction

Teenage pregnancy, defined as pregnancy in females under the age of 20, is a significant public health issue due to its high prevalence and associated morbidity [1]. It often leads to academic setbacks, unemployment, and socioeconomic deprivation, and increases the risk of psychiatric disorders, including depression [2]–[5].

Depression, marked by persistent sadness and diminished interest in activities, can be triggered by genetic vulnerabilities and traumatic life events [6]–[8]. Studies indicate a 25% to 33% increase in depression rates among first-degree relatives of affected individuals, with women being more susceptible due to their XX genetic makeup and hormonal changes during key life stages such as adolescence and pregnancy [9], [10]. Shifts in sex hormones like estrogen and progesterone can exacerbate depression risks by affecting serotonin, a neurotransmitter involved in mood regulation [6], [11]–[13].

The American Psychiatric Association (APA) states that a diagnosis of major depressive disorder requires the presence of five or more specific symptoms over two weeks, including depressed mood or anhedonia [14]. Symptoms also include significant weight changes, sleep disturbances, fatigue, feelings of worthlessness, and recurrent thoughts of death [14], [15]. Socio-demographic factors, obstetric history, and psychosocial stressors are key risk factors for mental disorders, particularly depression, especially during pregnancy [16]–[20]. Depression in this demographic is often undertreated due to insufficient screening practices,

highlighting the need for targeted detection and intervention [21]–[25].

Despite the evident issue of prenatal depression in teenage pregnancies, data and publications are scarce. World Health Organization (WHO) research shows that about 1 in 8 women with postpartum depression symptoms are teenagers, with about 7% experiencing depression during prenatal teenage pregnancy [26]. The disorder affects one in seven teenage pregnant women, many of whom do not receive the necessary testing and treatment. WHO indicates higher rates in low-and middle-income countries [26]. A Centers for Disease Control and Prevention (CDC) analysis found that depression diagnoses at delivery were seven times higher in 2015 than in 2000 [27]. Various factors, including psychosocial, socio-demographic, and clinical/obstetric, worsen depression in young mothers, negatively impacting their quality of life [28].

Most studies on prenatal depression focus on postpartum depression and are conducted in Western, developed countries, with fewer studies in Africa and Zambia [29], [30]. Moreover, these studies often focus on single factors and are limited to individual health facilities, complicating the generalization of findings. This study aims to address these gaps by investigating the correlates of prenatal depression in teenage pregnant women and evaluating their association with socio-demographic, obstetric/clinical, and psychosocial factors. This information could lead to innovative health strategies to prevent and mitigate adverse outcomes for mothers and children.

The study will explore the correlates associated with prenatal depression among teenage pregnant women at the University Teaching Hospital (UTH) and Chongwe Rural District Health Facility (CRDHF). It aims to dissect the interplay of demographic, psychosocial, and clinical factors contributing to prenatal depression within this demographic. Specifically, the study has two main objectives: to examine the demographic, psychosocial, and clinical correlates of prenatal depression in teenage pregnancies, and to determine the relationships between these variables and prenatal depression in teenage pregnancies.

The research seeks to answer critical questions: What are the primary correlates associated with prenatal depression among young women? How do socio-demographic, psychosocial, and clinical/obstetric factors interrelate to influence prenatal depression in teenage pregnancies?

The significance of this study lies in addressing a gap in understanding prenatal depression among teenagers, specifically those aged 13 to 17. By identifying and analyzing the extent of prenatal depression and its correlates, the study refines our understanding of its prevalence and lays the groundwork for preventive measures. This is particularly valuable given the scarcity of data and limited publications on this topic.

This study is distinctive in its comprehensive focus on all associated correlates of prenatal depression within a single framework, a first in Zambia, where most previous studies isolated single factors. Including data from two different geographical health facilities, the findings are expected to offer a robust basis for generalization, applicable to similar environments elsewhere. This research paves the way for innovative health strategies aimed at preventing and minimizing adverse outcomes for mothers and their children, enriching academic discourse, and enhancing practical health interventions in maternal and child health.

2. Method

2.1. Study Areas

UTH is Zambia's largest medical facility and serves as a key teaching center for the University of Zambia's School of Medicine. UTH caters to a diverse population with varying ethnic and socioeconomic backgrounds. Its antenatal clinic provides primary care to the local community and serves as a referral center for medium to high-risk pregnancies needing specialized interventions, such as caesarean sections and management of complications from conditions like hypertension, diabetes, epilepsy, asthma, and HIV/AIDS.

CRDHF, located 35 kilometers from Lusaka, offers antenatal care to its local population through its clinic. This facility ensures accessible healthcare services to the surrounding community, reinforcing its commitment to maternal and prenatal health.

2.2. Population

Annually, about 1050 pregnant women visit the antenatal clinic, mostly in their second and third trimesters, due to referrals in later pregnancy stages for proper delivery planning. The study was designed with a minimum statistical power of 10%, focusing on teenage pregnant women aged 13 to 17 years, spanning three to nine months of pregnancy, from both urban and rural backgrounds.

2.3. Sample Size and Sampling Techniques

The study recruited 105 teenage pregnant women from UTH and CRDHF. The sample size was calculated using the formula for minimum statistical power, derived from 10% of the estimated annual 1050 clinic attendees. This calculation incorporates a Z value of 1.96 for a 95% confidence level and an expected sample proportion, P, of 0.06%, based on typical clinic attendees.

A purposive sampling technique was used to select participants, allowing researchers to gather in-depth information from subjects meeting specific study objectives.

2.4. Inclusion and Exclusion Criteria

The study targeted depressed teenage pregnant women between 3 and 9 months of pregnancy, aged 13 to 17 years, using antenatal services at UTH and CRDHF. Eligible participants met DSM-5 criteria for depression and had completed at least primary education.

Exclusion criteria were established to avoid confounding factors, including developmental disabilities, ongoing chemotherapy or radiation treatments, previous brain injuries with significant loss of consciousness, CNS diseases not associated with depression, and severe neurological conditions. Participants with known psychiatric conditions treated with antipsychotic drugs were also excluded, as were those outside the specified age range.

2.5. Data Collection Procedure

Potential participants were identified and referred to the researcher by midwives in a private setting. They received detailed study information and gave their consent or assent. Screening was conducted using the Edinburgh Depression Scale for depressive symptoms, followed by psychosocial instruments such as the Perceived Stress Scale (PSS), the Medical Outcomes Study Social Support Survey (MOS-SSS), the Rosenberg Self-Esteem Scale (RSES), and the Generalized Anxiety Disorder 7-item scale (GAD-7). Additional clinical and obstetric data were extracted from hospital records. Each assessment session lasted about 90 minutes, and participants received a K50 transport refund.

2.6. Data Analysis

Statistical analysis was conducted using SPSS version 20.0. Descriptive statistics summarized demographic data, providing frequencies and percentiles. The Chi-square test compared mean performances between the two facilities, and Pearson correlation assessed relationships between various correlates and depression levels. Logistic regression analysis further explored these relationships, determining the impact of correlates on depression scores.

2.7. Ethical Considerations

Ethical approval was granted by the University of Zambia Biomedical Research Ethics Committee (UNZ-ABREC)–approval No 882-2020. Additional clearances were obtained from the National Health Research Authority (NHRA), UTH, and CRDHF, ensuring full compliance with ethical standards. Participation was voluntary, with informed consent obtained without affecting healthcare. Confidentiality was strictly maintained, with data shared only under authorized consent. While no physical risks were involved, psychological support was available for any distress encountered. Interviews were paused or stopped if necessary, and participants in poor health were excused to prevent stress.

TABLE I: Age Range of Participants

	Depression scores			
	Mild	Moderate	Severe	Total
13 years	0	2	0	2
14 years	7	7	06	20
15 years	7	10	08	25
16 years	0	10	20	30
17 years	6	16	06	28
Totals	20	45	40	105

TABLE II: Marital Status of Respondents

	Depression scores			
	Mild	Moderate	Severe	Total
Married	6	11	10	27
Unmarried	14	34	30	78
Total	20	45	40	105

TABLE III: Level of Education

	Depression scores			
	Mild	Moderate	Severe	Total
Primary	14	35	30	79
Secondary	5	8	10	23
Tertiary	1	2	0	3
Totals	20	45	40	105

TABLE IV: Household Income

	Depression scores			
	Mild	Moderate	Severe	Total
<500	2	6	5	13
500–1499	5	15	17	37
1500–2499	6	11	8	25
2500–3499	4	7	5	16
3500–4499	1	3	4	8
>5000	2	3	1	6
Total	20	45	40	105

3. Results

3.1. Age Range of Participants Vs. Depression

Table I presents the age distribution of the 105 participants, ranging from 13 to 17 years. Specifically, 2 participants were 13 years old (1.9%), 20 were 14 years old (19%), 25 were 15 years old (24%), 30 were 16 years old (29%), and 28 were 17 years old (27%). Among these, 40 participants (38%) were classified as severely depressed, with the 16-year-olds exhibiting the highest prevalence of severe depression at 75%.

3.2. Marital Status Vs. Depression

Table II indicates that among the 105 participants, 27 (26%) were married and 78 (74%) were unmarried. Additionally, 40 participants (38%) were classified as severely depressed, with 30 of these (75%) being unmarried.

3.3. Level of Education Vs. Depression

Table III reveals that among the 105 participants, 79 (75%) had completed primary education, 23 (22%) had secondary education, and 3 (2.9%) had achieved tertiary education. Of the 105 participants, 40 (38%) were identified as severely depressed, with 30 of these (75%) having only primary education.

3.4. Income Distribution Vs. Depression

Table IV shows the income distribution of the 105 participants: 12.4% (13 participants) earned less than K500, 35% (37 participants) earned between K500 and K1499, 23.8% (25 participants) earned between K1500 and K2499, 15.2% (16 participants) earned between K2500 and K3499, 15.2% (15 participants) earned between K3500 and K4499, and 5.7% (6 participants) earned more than K5000. Among these participants, 40 (38%) were severely depressed, with the highest incidence of severe depression, 17 cases (43%), occurring in the K500-K1499 income range.

3.5. Obstetric Correlates

Table V outlines various obstetric correlates, including bleeding, pre-eclampsia, intentions to abort, abortion

TABLE V: Depression Scores Vs. Obstetrics Correlates

		Bleeding		Total
		Yes	No	
Depression scores	Mild	06	14	20
	Moderate	18	27	45
	Severe	10	30	40
Total		34	71	105
		Preeclampsia		Total
		Yes	No	
Depression scores	Mild	04	16	20
	Moderate	20	25	45
	Severe	13	27	40
Total		37	68	105
		Intent to abort		Total
		Yes	No	
Depression scores	Mild	10	10	20
	Moderate	30	15	45
	Severe	18	22	40
Total		58	47	105
		Attempt to abort		Total
		Yes	No	
Depression scores	Mild	14	8	20
	Moderate	25	20	45
	Severe	17	23	40
Total		56	48	105
		Planned pregnancy		Total
		Yes	No	
Depression scores	Mild	4	18	20
	Moderate	12	33	45
	Severe	8	32	40
Total		24	81	105

attempts, and planned pregnancies. Among the 105 participants, 58 (55%) intended to abort while 47 (45%) had no such intention. Additionally, 40 participants (38%) were categorized as severely depressed.

3.6. *EPDS Scores of the Participants*

Fig. 1 illustrates the depression scores of the participants as assessed by the Edinburgh Postnatal Depression Scale (EPDS). Among the 105 participants evaluated, 19% exhibited mild depression, 34% displayed moderate depression, and a significant 43% were found to have severe depression.

3.7. *RSES Scores of the Participants*

Fig. 2 displays the self-esteem levels among 105 participants: 39% had low self-esteem, 39% exhibited normal self-esteem, and 22% demonstrated high self-esteem.

3.8. *PSS Scores of the Participants*

Fig. 3 illustrates the stress levels among 105 participants: 16% experienced low stress, 50% reported moderate stress, and 34% faced severe stress.

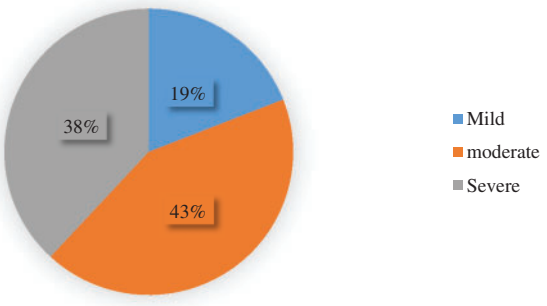

Fig. 1. Edinburgh postnatal depression scale scores of the participants.

3.9. *MOS-SSS Scores of the Participants*

Fig. 4 presents the social support levels among 105 participants: 24% experienced low social support, 42% received moderate social support, and 34% enjoyed high social support.

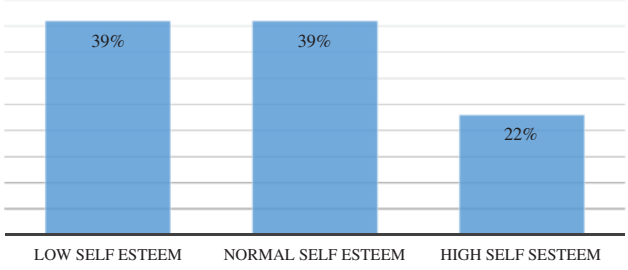

Fig. 2. Rosenberg self-esteem scale scores of the participants.

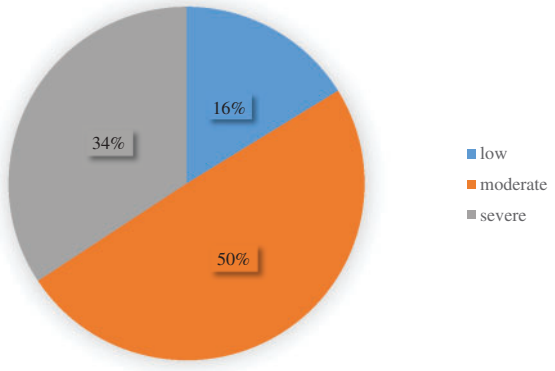

Fig. 3. The perceived stress scale score results of the participants.

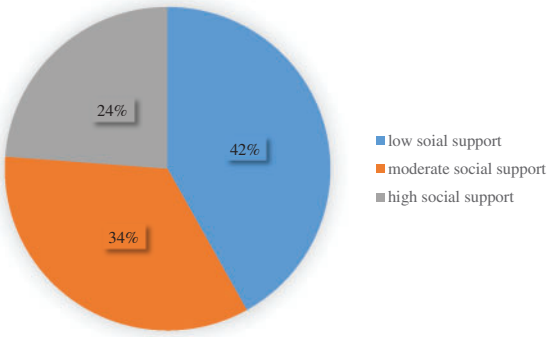

Fig. 4. The medical outcome study social support survey scores of the participants.

3.10. GAD-7 Scores of the Participants

Fig. 5 illustrates the distribution of anxiety levels among 105 participants: 28% experienced minimal anxiety, 30% had mild anxiety, 18% displayed moderate anxiety, and 24% suffered from severe anxiety.

3.11. Obstetric Correlates Between UTH and CRHF

Table VI compares obstetric correlate scores between UTH and CRHF. Among the examined correlates, only "attempt to abort" showed a statistically significant difference, with a p-value of 0.04, indicating significant variations in this measure between the two facilities.

3.12. Comparison of Psychosocial Correlates Between UTH and CHRF

Table VII presents a comparison of psychosocial correlates between UTH and CRHF. The results indicate significant differences in two of the psychosocial measures:

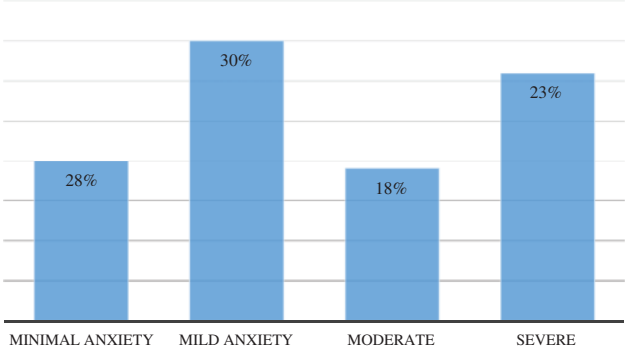

Fig. 5. Generalized anxiety disorder–7 scores of the participants.

stress and social support. Specifically, the differences in scores for stress and social support between the two facilities were statistically significant, with p-values of 0.05 and 0.03, respectively.

3.13. Comparing Household Incomes Between UTH and CRHF

Table VIII provides a comparison of the socio-demographic correlate 'household income' between UTH and CRHF. The analysis reveals significant differences in household income scores between the two facilities, with a p-value of 0.05, indicating a statistically significant disparity.

3.14. Comparison of Socio-Demographics Correlates Between UTH and CRHF

Table IX presents comparisons of socio-demographic correlates ('education level', 'marital status', and 'employment status') between UTH and CRHF. The analysis indicates that the differences in education level and marital status between the two facilities were statistically significant, with p-values of 0.05 and 0.01, respectively.

3.15. Associations Between Prenatal Depression and Obstetric, Psychosocial, and Sociodemographic Correlates

The analysis of prenatal depression and its associations with obstetric, psychosocial, and sociodemographic factors revealed significant findings. Only one obstetric correlate, 'attempt to abort,' showed a moderately positive association with depression ($r = 0.20$, $p = 0.04$). All psychosocial correlates demonstrated significant associations: stress and depression had a moderately positive correlation ($r = 0.29$, $p < 0.01$), perceived stress was moderately negatively correlated with depression ($r = -0.27$, $p = 0.01$), and anxiety showed a strongly negative correlation ($r = -0.80$, $p < 0.01$). Similarly, there was a moderately negative association between self-esteem and depression ($r = -0.37$, $p < 0.01$). However, none of the socio-demographic factors significantly correlated with depression.

Regression analyses revealed that various factors could predict depression. In the socio-demographic category, age range demonstrated a moderately positive relationship, accounting for 8% of the variability in depression. In the clinical/obstetric domain, the variable 'attempt to abort' showed a moderately positive relationship with depression,

TABLE VI: Comparison of Obstetric Correlates Between UTH and CRHF

	Depression (%)			Bleeding (%)		Pre-eclampsia (%)		Intent to abort %	
	Mild	Mod	Sev	Yes	No	Yes	No	Yes	No
UTH	19	45	34	13	87	17	83	09	91
CHRF	19	37	44	4	96	4	96	03	97
Sig		0.71			0.18		0.09		0.04

TABLE VII: Comparison of Psychosocial Correlates Between UTH and CHRF

	Stress (%)			Anxiety (%)				Self-esteem (%)			Social support (%)		
	Low	Mod.	Sev.	Min.	Mild	Mod.	Sev.	Low	Norm.	High	Low	Mod.	High
UTH	12	55	33	20	32	21	27	36	40	24	40	41	19
CHRF	30	33	37	15	37	11	37	40	37	15	48	15	37
Sig.		0.05			0.54				0.44			0.03	

TABLE VIII: Comparing Household Incomes Between UTH and CRHF

	Household income (%)					
	<500	500–1499	1500–2499	2500–3499	3500–4499	>5000
UTH	18	22	27	15	10	8
CHRF	4	74	15	7	0	0
Sig.				0.05		

TABLE IX: Comparison of Socio-Demographics Correlates Between UTH and CRHF

	Education level (%)			Marital status (%)		Employment status (%)	
	Pri	Sec.	Tert	Married	Unmarried	Employed	Unemployed
UTH	69	27	4	32	68	6	94
CHRF	93	7	0	7	93	0	100
Sig.		0.05			0.01		0.18

explaining 4% of its variability. Among psychosocial correlates, self-esteem, stress, anxiety, and social support were significant predictors of depression. These factors exhibited moderate relationships with depression, explaining 4%, 6%, 47%, and 11% of the variability, respectively.

3.16. Logistic Regression Analysis

Logistic regression analysis was employed to evaluate the relationship between depression scores and various independent variables, each represented as a dichotomous categorical outcome. Dummy variables were created for each independent variable to facilitate maximum likelihood estimations. Clinical correlates such as bleeding and hypertension were each split into two levels, using the presence of each condition as the reference category. In the psychosocial domain, self-esteem was categorized into three levels with high self-esteem as the reference; anxiety into four levels with severe anxiety as the reference; social support into three levels with low support as the reference; and perceived stress into three levels with severe stress as the reference. Socio-demographic factors like age were broken into seven levels with age sixteen as the reference, marital status into two with married as the reference, education into three with primary education as the reference, household income into six levels with the K500–K1499 range as the reference, and employment status into two with unemployment as the reference.

Three models were constructed to test the combined effects of these variables on depression scores:

- *Model 1 included clinical/obstetric correlates*: bleeding, pre-eclampsia, intent to abort, attempt to abort, and planned pregnancy.
- *Model 2 comprised psychosocial correlates*: self-esteem, perceived stress, anxiety, and social support.
- *Model 3 consisted of socio-demographic factors*: age, marital status, education level, household income, employment status, and facility attended.

In Model 1, none of the variables were significant, and the overall model lacked significance. In contrast, Model 2 was statistically significant; notably, anxiety emerged as a significant predictor, with a beta of 5.19 (SE = 1.09, p = 0.00), explaining substantial variance in depression scores (Cox and Snell R^2 = 0.50, Nagelkerke R^2 = 0.69). Model 3 also showed statistical significance with age as a significant variable; an increase in one standard deviation in age corresponded to a β increase of 1.33 in depression scores (SE = 0.55, p = 0.02). The models demonstrated varying predictive capabilities, with psychosocial factors showing a particularly strong link to depression, as evidenced by Model 2's high explanatory power.

4. Discussion

This study aimed to elucidate the determinants of prenatal depression among teenage pregnant women in urban and rural settings in Lusaka Province, Zambia, revealing a complex interplay of socio-economic, psychosocial, and demographic factors. The significant determinants identified, such as attempts to abort, stress, social support, household income, education level, and marital status, offer a deeper understanding of the challenges faced by this vulnerable population. These results align with existing literature indicating that socio-economic and psychosocial factors significantly impact prenatal depression [10], [19].

4.1. Socio-Economic and Demographic Determinants

Economic constraints and educational limitations are significant predictors of prenatal depression. Lower household incomes and limited education lead to higher depression rates among pregnant teenagers, underscoring socio-economic instability's impact on mental health [28]. Financial instability exacerbates feelings of uncertainty and inadequacy, particularly for pregnant teenagers facing early motherhood's complexities [16].

Economically disadvantaged teenagers often encounter multiple stressors like insecure housing, inadequate nutrition, limited healthcare access, and poverty-related stigma. These factors collectively heighten stress levels, increasing depression risk [20]. Moreover, a lack of financial resources limits access to necessary prenatal care, exacerbating health issues that contribute to depression risk.

Education also plays a critical role. Teenagers with only primary education lack access to vital prenatal health information, leading to poor health decisions and increased anxiety about pregnancy and motherhood. This educational gap limits future job prospects, perpetuating a cycle of poverty and mental health challenges [19]. Additionally, the isolation and reduced social interaction associated with lower educational attainment can intensify depression, with social support identified as a crucial mitigating factor [13].

Addressing these socio-economic challenges requires a multifaceted intervention approach. Public health initiatives should provide mental health services and tackle socio-economic barriers. Programs offering educational support, financial aid, and comprehensive prenatal care are essential for breaking the poverty cycle and improving mental health. Community-based support systems providing emotional and social support can also reduce stress related to economic and educational hardships.

The prevalence of prenatal depression among economically and educationally disadvantaged teenagers necessitates an integrated care approach, combining clinical, social, and economic interventions tailored to this vulnerable group's needs. Such strategies can enhance health outcomes for mothers and their future children, promoting healthier generations [21], [23].

Moreover, unmarried status correlates with higher depression scores, underscoring the mental health challenges single mothers face due to lacking partner support. The absence of a partner reduces emotional and practical support, often increasing social stigma and isolation, which exacerbates the psychological stress experienced during pregnancy and heightens the risk of prenatal depression [9].

The protective role of social support is pivotal. Practical support, such as medical appointment assistance, financial help, and daily task support, is crucial yet often inaccessible to unmarried pregnant teenagers. This lack of support adds significant stress, compounded by financial difficulties and pregnancy's physical demands [3].

Interventions should include programs that strengthen social networks, like community support groups and mentoring programs involving experienced mothers. Increased access to mental health services and educational programs aimed at reducing stigma around teenage pregnancy and single motherhood are also vital.

Incorporating these support mechanisms into prenatal care programs can substantially alleviate the mental health burden on these young women, benefiting not only the individuals but also fostering healthier familial and community environments. This study's evidence highlights the importance of enhancing social support networks to mitigate the adverse effects associated with being an unmarried pregnant teenager, emphasizing the need for holistic approaches in prenatal healthcare settings.

4.2. Psychosocial Determinants

Stress and self-esteem are significant psychosocial predictors of prenatal depression. High stress levels correlate strongly with elevated depression scores, highlighting the need for stress management interventions in antenatal care programs [20]. Stress during pregnancy, stemming from financial concerns, relationship issues, and anxiety about parenting responsibilities, can particularly affect younger mothers, leading to mental health conditions like prenatal depression and adverse fetal outcomes such as preterm labor or low birth weight [31].

Non-pharmacological methods, such as mindfulness and relaxation techniques, are effective in managing stress. These practices can decrease anxiety, alleviate depression symptoms, and improve the overall well-being of expectant mothers. Structured mindfulness programs, for instance, have been shown to reduce stress markers and enhance emotional regulation in pregnant women [32]. Techniques like progressive muscle relaxation and guided imagery also offer substantial benefits in reducing stress and boosting maternal mental health [33].

Additionally, enhancing self-esteem is crucial in antenatal care. Low self-esteem, often linked to a greater risk of depression, influences stress perception, and increases feelings of helplessness and vulnerability. Interventions aimed at building a positive self-image and developing coping skills can mitigate the impact of stress on mental health. Programs that improve self-esteem have shown that pregnant teenagers with lower self-esteem scores tend to exhibit higher depression scores, emphasizing the importance of self-esteem in mental health [13].

Supportive therapies and educational sessions, such as cognitive-behavioral therapy (CBT), can effectively enhance self-esteem by transforming negative thoughts and behaviors into positive ones [34]. Group therapy sessions that connect pregnant teenagers with peers can also

help reduce isolation and boost social support, further enhancing self-esteem [35].

Empowerment programs that include skill-building workshops, prenatal and parenting education, and vocational training tailored to young expectant mothers can foster a sense of achievement and self-worth [36]. These programs not only help pregnant teenagers develop a positive outlook on their future but also strengthen their ability to cope with stress, reducing their risk of depression.

4.3. Obstetric Determinants

Interestingly, clinical factors such as attempts to abort and obstetric complications were not significant predictors of prenatal depression in our logistic regression models, contradicting some studies that link these factors strongly with prenatal depression [29]. This discrepancy could be due to different social contexts or dynamics within the study populations, highlighting the necessity for context-specific research.

In Lusaka Province, the absence of a significant correlation might reflect unique aspects of the healthcare system or cultural influences. In parts of Zambia, pregnancy-related issues are heavily stigmatized, potentially affecting the reporting and recognition of obstetric complications and their psychological impacts. The available support systems (or it lack) might also influence the mental health outcomes of these complications.

Conditions like gestational diabetes, hypertension, and pre-eclampsia are documented risk factors for prenatal depression. Managing these conditions can significantly stress pregnant women, potentially leading to depression due to the physical and emotional strain and the need for substantial medical intervention [19].

Furthermore, the decision to abort can be traumatic, especially where abortion is culturally stigmatized or legally restricted, potentially leading to depressive symptoms. The psychological impact of such decisions varies greatly depending on the support from partners, family, and healthcare providers [37].

This underscores the importance of developing culturally sensitive research methodologies that consider the specific healthcare and social contexts of the study population, ensuring that interventions are effectively tailored to meet diverse cultural needs.

4.4. Implications for Practice and Policy

This study highlights the importance of socio-economic, psychosocial, and demographic factors in predicting prenatal depression, emphasizing the need for comprehensive screening processes. By incorporating variables such as income level, education, marital status, and stress factors into routine prenatal screenings, healthcare providers can identify and intervene earlier with at-risk populations, particularly in regions like Lusaka Province. Early detection allows for tailored interventions, enhancing the efficacy of treatment plans and support systems.

The insights gained should inform public health policies aimed at improving maternal mental health. Policies could include funding for integrated mental health services in prenatal care facilities, training healthcare providers on the psychosocial aspects of prenatal care, and community outreach programs to reduce stigma and increase awareness about mental health during pregnancy.

Given the high prevalence of prenatal depression among teenagers, targeted mental health services and support systems are crucial. Implementing interventions like CBT and Interpersonal Therapy (IPT) could be particularly beneficial [15]. These therapies, effective in treating prenatal depression, should be adapted for cultural relevance and accessibility in Low and Middle-Income Countries (LMICs).

Incorporating these evidence-based therapies into routine prenatal care requires careful planning and resource allocation. Ensuring that these services are culturally sensitive and accessible to all pregnant teenagers is essential. Such integrated care models could significantly improve outcomes, reducing the incidence and severity of prenatal depression and fostering a foundation for healthy motherhood. These programs should be developed in collaboration with local communities to ensure they meet specific needs and are sustainable long-term.

5. Conclusion

This study aimed to explore the correlates of prenatal depression in teenage pregnancies, specifically examining the relationship between socio-demographic, obstetric/clinical, and psychosocial factors and depression. Significant findings indicated that the most severe cases of depression were among 16-year-old, unmarried teenagers with primary education and household incomes between 500 and 1499 Zambian Kwacha, residing in UTH reported more severe cases than CRHF.

The analysis identified household income, marital status, education level, attempts to abort, stress, and social support as significant links to prenatal depression. Regression analyses emphasized that variables like self-esteem, stress, anxiety, social support, age, and attempts to abort significantly correlate with depression. However, obstetric correlates were not significant predictors.

The results highlight the need for early screening, detection, and intervention to address the morbidity and risks associated with prenatal depression, such as compromised maternal health and adverse neonatal outcomes like preterm birth and low birth weight.

Recommendations

This study underscores the critical importance of comprehensive antenatal care that integrates clinical, psychosocial, and socio-demographic assessments to mitigate prenatal depression's impact. It suggests enhancing awareness through media and community outreach, training healthcare providers in psychotherapy, and urging policymakers to meet the specific needs of teenage pregnant women to improve health outcomes.

Conflict of Interest

Authors declare that they do not have any conflict of interest.

References

[1] Leftwich HK, Alves MV. Adolescent pregnancy. *Pediatr Clinic*. 2017;64(2):381–8.

[2] Maemeko EL, Nkengbeza D, Chokomosi TM. The impact of teenage pregnancy on academic performance of grade 7 learners at a school in the Zambezi region. *Open J Soc Sci*. 2018;6(9):88–100.

[3] Barnet B, Liu J, DeVoe M. Double jeopardy: depressive symptoms and rapid subsequent pregnancy in adolescent mothers. *Arch Pediatr Adolesc Med*. 2008;162(3):246–52.

[4] Tsikouras P, Dafopoulos A, Trypsianis G, Vrachnis N, Bouchlariotou S, Liatsikos SA, *et al.* Pregnancies and their obstetric outcome in two selected age groups of teenage women in Greece. *J Mater-Fetal Neonatal Med*. 2012;25(9):1606–11.

[5] Barnet B, Joffe A, Duggan AK, Wilson MD, Repke JT. Depressive symptoms, stress, and social support in pregnant and postpartum adolescents. *Arch Pediatr Adolesc Med*. 1996;150(1):64–9.

[6] Tsarkov A, Petlovanyi P. Depressive disorder in child psychiatric practice: a case report. *Health Press Zambia Bull*. 2017;1(5):9–16.

[7] Hildingsson I, Rubertsson C. Depressive symptoms during pregnancy and after birth in women living in Sweden who received treatments for fear of birth. *Arch Women's Ment Health*. 2022;25(2):473–84.

[8] Tsarkov A, Petlovanyi P, Paul R, Prashar L. Modern approach to the treatment of Parkinson's disease: the role of pramipexole in the correction of motor and non-motor disorders. *Br J Med Health Res (BJMHR)*. 2017;4(2):63–71.

[9] Turner RJ, Grindstaff CF, Phillips N. Social support and outcome in teenage pregnancy. *J Health Soc Behav*. 1990;31(1):43–57.

[10] Bunevicius R, Kusminskas L, Bunevicius A, Nadisauskiene RJ, Jureniene K, Pop VJ. Psychosocial risk factors for depression during pregnancy. *Acta Obstetricia et Gynecologica Scandinavica*. 2009;88(5):599–605.

[11] Albert KM, Newhouse PA. Estrogen, stress, and depression: cognitive and biological interactions. *Annu Rev Clinic Psychol*. 2019;15(1):399–423.

[12] Petlovanyi P, Tsarkov A. Child schizophrenia: theory and practice. *Eur J Med Health Sci (EJMED)*. 2020;2(1):1–5.

[13] Wieczorek K, Targonskaya A, Maslowski K. Reproductive hormones and female mental wellbeing. *Women*. 2023;3(3):432–44.

[14] American Psychiatric Association. Diagnostic and statistical manual of mental disorders. In *Text Revision*, 5th ed. Washington (DC): Amer Psychiatric Pub Inc, 2022.

[15] Boland R, Verduin M, Ruiz P. *Kaplan & Sadock's Synopsis of Psychiatry*. 12th ed. Philadelphia (PA): Lippincott Williams & Wilkins (LWW); 2021.

[16] Ongeri L, Wanga V, Otieno P, Mbui J, Juma E, Stoep AV, *et al.* Demographic, psychosocial and clinical factors associated with postpartum depression in Kenyan women. *BMC Psychiatry*. 2018;18(1):1–9.

[17] Moonga VJ, Tsarkov A, Petlovanyi P. A descriptive study on the factors influencing readmission of mentally ill adults at chainama hills college hospital, Lusaka, Zambia. *Eur J Med Health Sci (EJMED)*. 2023;5(3):51–9.

[18] Miguez MC, Vázquez MB. Risk factors for antenatal depression: a review. *World J Psychiatry*. 2021;11(7):325–36.

[19] Kumar JS, Paul R, Tsarkov A, Zyambo C. The prevalence of alcohol use among pregnant women attending antenatal clinic at mother and new born hospital-university teaching hospital, Lusaka. Zambia. *EC Psychol Psychiatry*. 2020;9(9):87–111.

[20] Field T. Prenatal depression effects on early development: a review. *Infant Behav Dev*. 2011;34(1):1–14.

[21] Figueiredo B, Bifulco A, Pacheco A, Costa R, Magarinho R. Teenage pregnancy, attachment style, and depression: a comparison of teenage and adult pregnant women in a Portuguese series. *Attachment Hum Dev*. 2006;8(2):123–38.

[22] Lungu G, Tsarkov A, Petlovanyi P, Phiri C, Musonda NC, Hamakala D, *et al.* Health-seeking behaviors and associated factors in individuals with substance use disorders at Chainama Hills College Hospital, Lusaka, Zambia. *World J Adv Res Rev*. 2023;17(3):480–99.

[23] Tsarkov A, Msoni P, Petlovanyi P. Induced delusional disorder: a case report. *Br J Med Health Res (BJMHR)*. 2018;5(6):12–22.

[24] Edwards B, Galletly C, Semmler-Booth T, Dekker G. Does antenatal screening for psychosocial risk factors predict postnatal depression? A follow-up study of 154 women in Adelaide, South Australia. *Australian New Zealand J Psychiatry*. 2008;42(1):51–5.

[25] Edwards B, Galletly C, Semmler-Booth T, Dekker G. Antenatal psychosocial risk factors and depression among women living in socioeconomically disadvantaged suburbs in Adelaide, South Australia. *Australian New Zealand J Psychiatry*. 2008;42(1):45–50.

[26] Institute of Health Metrics and Evaluation. *Global Health Data Exchange (GHDx)*. Seattle, WA: University of Washington; 2021.

[27] Centers for Disease Control and Prevention. *Depression Among Women*. Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion; 2021.

[28] Jahan N, Went TR, Sultan W, Sapkota A, Khurshid H, Qureshi IA, *et al.* Untreated depression during pregnancy and its effect on pregnancy outcomes: a systematic review. *Cureus*. 2021;13(8):e17251.

[29] Batra K, Pharr J, Olawepo JO, Cruz P. Understanding the multidimensional trajectory of psychosocial maternal risk factors causing preterm birth: a systematic review. *Asian J Psychiatr*. 2020;54:102436.

[30] Reid V, Meadows-Oliver M. Postpartum depression in adolescent mothers: an integrative review of the literature. *J Pediatr Health Care*. 2007;21(5):289–98.

[31] Coussons-Read ME. Effects of prenatal stress on pregnancy and human development: mechanisms and pathways. *Obstet Med*. 2013;6(2):52–7.

[32] Noroña-Zhou AN, Coccia M, Epel E, Vieten C, Adler NE, Laraia B, *et al.* The effects of a prenatal mindfulness intervention on infant autonomic and behavioral reactivity and regulation. *Psychosom Med*. 2022;84(5):525–35.

[33] Toussaint L, Nguyen QA, Roettger C, Dixon K, Offenbächer M, Kohls N, *et al.* Effectiveness of progressive muscle relaxation, deep breathing, and guided imagery in promoting psychological and physiological states of relaxation. *Evid Based Complement Alternat Med*. 2021;2021:5924040.

[34] Hofmann SG, Asnaani A, Vonk IJ, Sawyer AT, Fang A. The efficacy of cognitive behavioral therapy: a review of meta-analyses. *Cogn Ther Res*. 2012;36(5):427–40.

[35] Hodgkinson S, Beers L, Southammakosane C, Lewin A. Addressing the mental health needs of pregnant and parenting adolescents. *Pediatrics*. 2014;133(1):114–22.

[36] Nkhoma DE, Lin CP, Katengeza HL, Soko CJ, Estinfort W, Wang YC, *et al.* Girls' empowerment and adolescent pregnancy: a systematic review. *Int J Environ Res Public Health*. 2020;17(5):1664.

[37] Lyon R, Botha K. The experience of and coping with an induced abortion: a rapid review. *Health SA*. 2021;26(1):1543.