Interdisciplinary
Advances in Health

QUARKLIC

ORIGINAL

Anxiety, Depression, Quality of Life, Subjective Well-being, and Social Support as Predictors of Emotional Development in Pregnant Adolescents with HIV

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OPEN ACCESS

Citation
Cevallos-Salazar, A. (2023). Anxiety, Depression, Quality of Life, Subjective Well-being, and Social Support as Predictors of Emotional Development in Pregnant Adolescents with HIV. *Interdisciplinary Advances in Health*, *1*, 3. https://doi.org/10.69653/iah20233

Submitted: 11-06-2023
Accepted: 19-12-2023
Published: 20-12-2023

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Abstract

Background: The emotional health of pregnant adolescents with HIV is influenced by multiple psychosocial factors. This vulnerable group faces significant challenges that affect their quality of life and subjective well-being due to the stigma and discrimination associated with both HIV and adolescent pregnancy. Anxiety and depression are prevalent in this population and may compromise their emotional development and adherence to antiretroviral treatment.
Objective: To assess how anxiety, depression, quality of life, subjective well-being, and social support act as predictors of emotional development in pregnant adolescents with HIV.
Methods: A cross-sectional study was conducted involving 368 HIV-positive pregnant adolescents aged 12 to 17 years in Ecuador, using questionnaires to measure anxiety, depression, social support, subjective well-being, and quality of life. Structural equation modeling was employed to analyze the relationships among these variables.
Results: Data revealed a positive correlation between subjective well-being, quality of life, social support, and emotional development. Anxiety and depression showed a strong negative correlation with emotional development. Statistical tests indicated a good fit of the theoretical model with CFI and TLI greater than .90, an RMSEA of 0.06, and an SRMR of 0.07, confirming the proposed hypotheses. **Conclusions:** Depression and anxiety have a significant negative impact on the emotional development of pregnant adolescents with HIV, whereas social support, subjective well-being, and good quality of life act as protective factors. These findings underscore the importance of specific interventions that improve social support and address mental health issues to promote healthy emotional development in this group. The research provides a basis for future strategies aimed at improving the psychological and emotional aspects in pregnant adolescents with HIV, highlighting the need for a holistic approach in health care.

Keywords:

Emotional Development, Adolescence And HIV, Anxiety And Depression, Social Support, Quality Of Life.

Introduction

In the current context, mental health emerges as a crucial pillar for overall well-being, recognized not only as an essential human right but also as a vital component for personal, community, and socioeconomic development (Godoy et al., 2020). Within this framework, the emotional health of pregnant adolescents with HIV

represents a particular area of interest due to the convergence of multiple risk factors and vulnerabilities. Adolescence is a significant transitional stage encompassing biological, psychological, and sociocultural changes. The World Health Organization defines this stage as the period extending from 10 to 19 years, subdivided into early, middle, and late adolescence (Totomol et al., 2023). During this time, adolescents are particularly susceptible to emotional disorders such as anxiety and depression, especially during critical life events like pregnancy (Diaz et al., 2013). Adolescent pregnancy is a global public health issue, exacerbated in contexts of poverty, exclusion, and gender-based violence, often coexisting with weaknesses in access to sexual and reproductive (Ministerio de Educación del Ecuador, 2017). This problem intensifies when adolescent pregnancy is complicated by an HIV diagnosis, a virus that weakens the immune system by attacking CD4 lymphocytes (Vera et al., 2004). The incidence of HIV among adolescents remains high, underscoring the need for preventive approaches and specialized care for this population (Cortés et al., 2000). The convergence of HIV and pregnancy in adolescents not only poses medical challenges but also deepens psychosocial implications, affecting the quality of life, subjective well-being, and emotional development of these young women. These adolescents face stigma and discrimination, which can deteriorate their social support, a crucial factor for their mental and emotional health (S. S. Martins et al., 2007; OMS, OPS, UNFPA, 2018). In summary, research on the predictors of emotional development in pregnant adolescents with HIV must comprehensively consider aspects such as anxiety, depression, quality of life, subjective well-being, and social support. These factors not only indicate their current health status but also can predict their future life trajectories, highlighting the importance of early and contextually appropriate interventions (UNAIDS, 2023; WHO, 2018).

The quality of life in pregnant adolescents with HIV can be significantly impacted by the stigma associated with both HIV and adolescent pregnancy, which can reduce perceived social support, a fundamental element for subjective well-being and positive emotional development in this population (Earnshaw & Chaudoir, 2009; Logie & Gadalla, 2009). It is essential for the pregnancy to progress with minimal disruption to the autonomy and daily life of the adolescents to preserve their quality of life (Guarino, 2010). Social support acts as a buffer against the negative effects of anxiety and depression, thereby improving quality of life and subjective well-being (Cohen & Wills, 1985). According to the World Health Organization, social support should be considered within the individual's cultural and value context, and how these factors relate to their personal expectations and goals (Martín et al., 2009). Such support can come from various sources, including family, friends, the community, and healthcare providers, and has been shown to enhance resilience, reduce symptoms of anxiety and depression, and promote healthy and adaptive behaviors (Simoni et al., 2006) Additionally, anxiety and depression are common comorbidities that can be exacerbated by stigma and pregnancy complications in adolescents with HIV, affecting not only their physical health but also their emotional development (Bhana et al., 2016). It is imperative to integrate these factors to explore their predictive potential and design specific interventions that address the needs of this vulnerable group. Although there are studies analyzing various aspects of mental health and social support in adolescents with HIV, there remains a significant gap in the literature on how these elements interact and specifically affect pregnant adolescents with HIV (Allan-Blitz et al., 2021)except among youth, and in particular among Black and Latinx young men who have sex with men (MSM.

In this complex scenario, anxiety and depression emerge as prevalent disorders that not only deteriorate the quality of life but also compromise adherence to antiretroviral treatment and proper pregnancy management. These disorders profoundly affect mood and can disrupt normal cycles of sleep, eating, and self-esteem (Diener et al., 2012; Hidalgo & Rodríguez, 2013). Subjective well-being, reflecting the cognitive and emotional evaluation of the adolescents' lives, is identified as a potential buffer against psychological stress. Higher levels of subjective well-being are associated with better health outcomes and greater treatment adherence in people with HIV (Diener et al., 2012; Moskowitz et al., 2009). This well-being is closely linked to emotional development, enabling adolescents to have a greater awareness of their own emotions and those of others, which is crucial for their adaptation to pregnancy and management of HIV (Mulsow, 2008). Additionally, social support represents an essential pillar, as it not only modulates the effects of stress but also directly influences the well-being and emotional adaptation of adolescents (Uchino, 2006). This support can mitigate the impact of the stigmas associated with HIV and the emotional and physical demands of pregnancy, significantly improving the quality of life in this group (Earnshaw & Chaudoir, 2009).

In Latin America and the Caribbean, it is reported that four out of five pregnancies in adolescents are unintended, reflecting not only a high prevalence but also highlighting the existing social and gender inequalities in these regions (Valcárcel et al., 2018). The high fertility rate among adolescents in countries such as Venezuela, Ecuador, and Bolivia (Bucheli et al., 2018) suggests a scenario where early motherhood can significantly limit the autonomy and future opportunities of young women (Céspedes & Robles, 2016). Specifically, in Ecuador, the incidence of adolescent pregnancies is particularly high, with a notable number of births among young women under 20 years of age (Arias Rodríguez et al., 2023). Additionally, a significant proportion of these pregnancies result from initial sexual relationships with much older partners, and a notable minority end in abortion (Ministerio de Salud Pública, 2021)

Considering the above arguments, the following hypotheses are proposed (Figure 1):

- H1: There is a negative relationship between Depression and Emotional Development.
- H2: There is a positive relationship between Social Support and Emotional Development.
- H3: There is a negative relationship between Anxiety and Emotional Development.
- H4: There is a positive relationship between Social Well-being and Emotional Development.
- H5: There is a positive relationship between Quality of Life and Emotional Development.

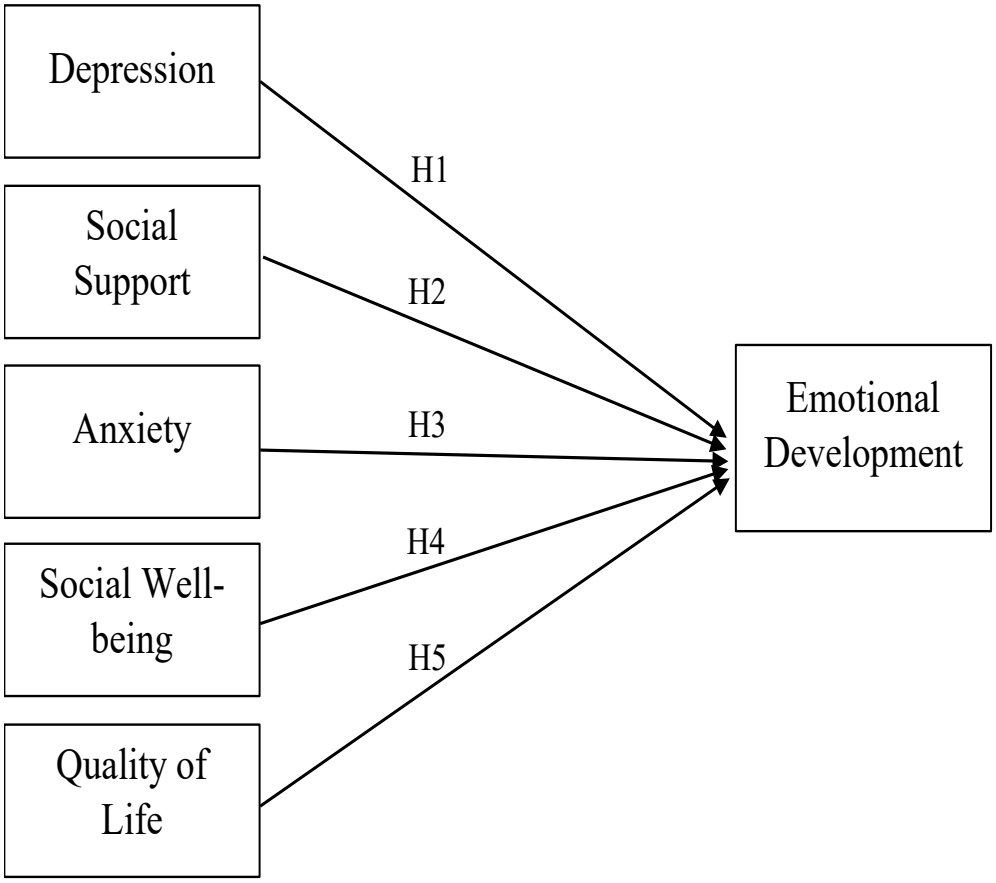


Figure 1. Theoretical Model

Methods

Design and Participants:

A cross-sectional and explanatory study was designed (Ato et al., 2013). For the sample size analysis, the Soper calculator was used (Soper, 2024), considering the number of variables in the model, an effect size that accounts for the number of observed and latent variables in the model, the anticipated effect size ($\lambda = 0.3$), the desired statistical significance ($\alpha = 0.05$), and the statistical power level ($1 - \beta = 0.95$), which suggests a minimum sample size of 223. However, this study includes a sample of 368 pregnant adolescent patients with HIV, aged between 12 and 17 years (M=15, SD=1.17) from Ecuador. Table 1 shows the sociodemographic characteristics, indicating that 97.3% of the surveyed women have completed secondary education, reflecting a high level of basic schooling among them.

Regarding marital status, the majority of the women are single, with 84.2%, followed by those in common-law relationships at 14.7%. Concerning the age at first sexual intercourse, the ages with the highest percentages are 15 years at 30.7%, followed by 14 years at 27.7% and 16 years at 20.7%. Additionally, regarding reproductive experience, 58.2% of the respondents are experiencing their first pregnancy, while 41.8% have been pregnant two or more times. These data reflect significant aspects of the demographics and sexual and reproductive behavior of this group.

Table 1. Descriptive Statistics

Characteristic		**n**	**%**
Educational Level	No Education	2	.5
	Primary	8	2.2
	Secondary	358	97.3
Marital Status	Married	4	1.1
	Single	310	84.2
	Common-law Union	54	14.7
Age at First Sexual Intercourse	12	5	1.4
	13	15	4.1
	14	102	27.7
	15	113	30.7
	16	76	20.7
	17	57	15.5
Number of Previous Pregnancies	Two or More Pregnancies	154	41.8
	First Pregnancy	214	58.2

Procedure:

For the execution of this research, a letter of introduction was addressed to the Gyneco-Infectology department of a hospital in Guayaquil, Ecuador, to obtain the necessary permission. Additionally, before data collection, approval was obtained from the ethics committee of the Graduate School at Universidad Peruana Unión (UPeU), under the code 2023-CE-EPG-00014. An informed consent form was also sent virtually to the legal guardians of the participating adolescents, briefly outlining the research objectives and ensuring anonymity, confidentiality, and respect for the participants' autonomy and right to freedom. The results obtained will be used exclusively for academic purposes. The main data collection instrument was a questionnaire administered via Google Forms, which assessed variables such as anxiety, depression, quality of life, subjective well-being, and social support, considered predictors of emotional development in pregnant adolescents with HIV.

Instruments:

Sociodemographic and Clinical Data: Information on age, sex, sexual orientation, socioeconomic level, employment status, educational level, and people with whom the participant lives was collected using a self-administered questionnaire for adolescents. This instrument aimed to explore attitudes, knowledge, and sexual behaviors related to sexually transmitted infections and the human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) (Cortés et al., 2000).

Anxiety: The Generalized Anxiety Disorder Scale (GAD-7) was primarily designed for detection and severity measurement of GAD. It also has excellent operational characteristics for social anxiety disorder. This scale consists of 7 items, each scored between 0 and 3, with possible minimum and maximum scores (Spitzer et al., 2006)there is no brief clinical measure for assessing GAD. The objective of this study was to develop a brief self-report scale to identify probable cases of GAD and evaluate its reliability and validity. Methods: A criterion-standard study was performed in 15 primary care clinics in the United States from November 2004 through June 2005. Of a total of 2740 adult patients completing a study questionnaire, 965 patients had a telephone interview with a mental health professional within 1 week. For criterion and construct validity, GAD self-report scale diagnoses were compared with independent diagnoses made by mental health professionals; functional status measures; disability days; and health care use. Results: A 7-item anxiety scale (GAD-7.

Depression: The PHQ-2 was used, consisting of 2 questions regarding the frequency of depressed mood over the past two weeks, each scored from 0 ("not at all") to 3 ("nearly every day"). The PHQ-2 score ranges from 0 to 6. A score of 3 was identified by the authors as the optimal cutoff for detecting major depressive disorder; a score of 3 or higher indicates a likely major depressive disorder (Kroenke et al., 2003)including the 9-item Patient Health Questionnaire depression module (PHQ-9.

Emotional Development: This was assessed using the Revised Emotional Awareness Questionnaire (Rieffe et al., 2008)which refers to an attentional process (e.g. to monitor and differentiate emotions, locate their antecedents, a 30-item self-report with response options ranging from 1 to 3 points (1: False, 2: Sometimes true, 3: True).

Social Support: Evaluated using the Duke-UNC-11 Functional Social Support Questionnaire, validated in Spain for the general population and those with HIV. It consists of 11 items with Likert-type response options ranging from 1 ("as much as I would like") to 5 ("much less than I would like"). This questionnaire has high

reliability as it includes two subscales related to confidential social support (opportunities to communicate with people) and affective support (demonstrations of affection, empathy, and love) (S. Martins et al., 2022)it is important to gather knowledge about the different forms of support that families can benefit from. The aim of this study was to translate, adapt, and validate the Portuguese version of the Duke-UNC Functional Social Support Questionnaire (FSSQ.

Subjective Well-being: The method proposed by Herdman et al. was used, which includes the GWBI (6 items with a 5-point Likert scale format, ranging from "never" to "always") (Herdman et al., 1998)interviews and discussions with researchers working in HRQoL and related areas and practical experience in the adaptation and development of HRQoL instruments. The model incorporates six key types of equivalence. For each type of equivalence the paper provides a definition, proposes various strategies for examining whether and how types of equivalence can be achieved, illustrates the relationships between them and suggests the order in which they should be tested. The principal conclusions are: (1.

Quality of Life: The Spanish version of the Quality of Life Index was used, consisting of ten items using a semantic differential scale from 1 to 10 points, where 1 is poor and 10 is excellent (Mezzich et al., 2000).

Data Analysis

To analyze the proposed theoretical model, structural equation modeling (SEM) was employed using the MLR estimator. This estimator is suitable for handling numerical variables and is robust against deviations from inferential normality (Muthen & Muthen, 2017). The model fit was assessed using indicators such as the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). Adequate values were considered to be CFI and TLI greater than .90 (Bentler, 1990), an RMSEA less than . (MacCallum et al., 1996), and an SRMR also less than .080 (Browne & Cudeck, 1992).

Calculations were performed using R software, version 4.1.2, and the "lavaan" package, version 0.6-10 (Rosseel, 2012).

Results

Preliminary Analysis

The results in Table 1 reflect various variables evaluated through means (M) and standard deviations (SD). The depression scale shows moderate reliability with an α of 0.64. In contrast, the social support scale shows high reliability with an α of 0.90. Similarly, anxiety has very high reliability with an α of 0.89, while social well-being registers an α of 0.82. Quality of life stands out with the highest reliability at an α of 0.94, and emotional development also shows good reliability with an α of 0.84. The results presented correspond to correlations between different psychological and social variables. Anxiety has a strong positive correlation with depression ($r = .74$, $p < .01$), indicating that higher anxiety is associated with higher depression. On the other hand, social support shows a moderate negative correlation with depression ($r = -.52$, $p < .01$), suggesting that higher social support is associated with lower depression. In terms of social well-being, a very high positive correlation with social support ($r = .78$, $p < .01$) and a high positive correlation with quality of life ($r = .79$, $p < .01$) are observed. Anxiety also shows moderate negative correlations with social well-being ($r = -.59$, $p < .01$) and quality of life ($r = -.57$, $p < .01$), implying that lower levels of anxiety are associated with better social well-being and better quality of life. Finally, emotional development is positively correlated with social support ($r = -.37$, $p < .01$), social well-being ($r = -.38$, $p < .01$), and quality of life ($r = -.32$, $p < .01$), and negatively correlated with depression ($r = .35$, $p < .01$) and anxiety ($r = .49$, $p < .01$).

Table 2. Descriptive Statistics, Internal Consistencies, and Correlations for Study Variables

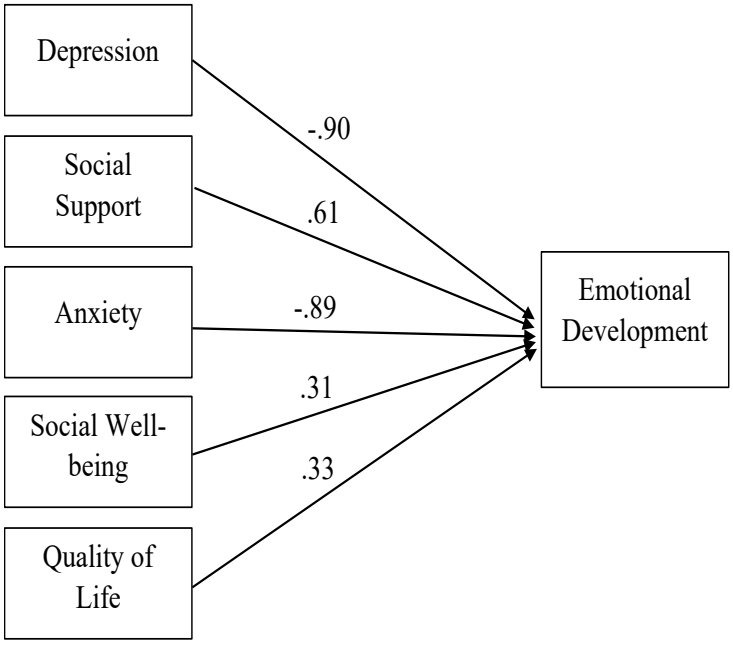
Variable	M	SD	α	1	2	3	4	5
1.Depression	1.63	1.3	.64					
2.Social Support	29.8	5.21	.90	-.52**				
3. Anxiety	6.24	4.24	.89	.74**	-.59**			
4. Social Well-being	16.89	3.03	.82	-.56**	.78**	-.59**		
5.Quality of Life	79.67	11.57	.94	-.53**	.74**	-.57**	.79**	
6. Desarrollo Emocional	5.04	2.93	.84	-.35**	.37**	-.49**	.38**	.32**

** $p < .01$. α =Alfa de Cronbach

Analysis of the Theoretical Model

The fit of the theoretical model presented in Figure 1 shows an adequate fit: $x^2 = 1235.190$, $df = 501$, $p < .001$, CFI = .90, TLI = .90, RMSEA = 0.06 (90% CI 0.06 - 0.07), SRMR = 0.07. The loadings indicate strong negative effects of Depression (H1, ß = -.90, $p < .001$) and Anxiety (H3, ß = -.89, $p < .001$) on Emotional Development,

while Social Support (H2, ß = .61, p < .001), Social Well-being (H4, ß = .31, p < .001), and Quality of Life (H5, ß = .33, p < .001) show significant positive effects. These results are crucial for understanding the dynamics influencing Emotional Development in the studied context.



Discussion

In a context where adolescent pregnancy represents a public health problem exacerbated by HIV, these factors acquire critical relevance. Adolescence is a phase of vulnerability to emotional disorders, particularly in situations of increased stress such as pregnancy and chronic illnesses. The stigma and discrimination associated with HIV and adolescent pregnancy can significantly deteriorate the quality of life and subjective well-being of young women, reducing perceived social support and exacerbating anxiety and depression, which in turn negatively affect their emotional development. However, robust social support can act as a buffer against these negative effects, facilitating better emotional development. This study aims to evaluate the impact of anxiety, depression, quality of life, subjective well-being, and social support as predictors of emotional development in pregnant adolescents with HIV.

Hypothesis 1, which presented a negative relationship between Depression and Emotional Development in pregnant adolescents with HIV, was confirmed. This phenomenon can be understood through various interconnected dimensions, such as the impact of depression on self-perception and social interactions, which is fundamental during adolescence—a critical period for developing emotional and social skills. In this sense, depression in pregnant adolescents with HIV can diminish their ability to process and respond to emotions adequately. Depressive symptoms, such as persistent sadness, lack of energy, and social isolation, can compromise adolescents' ability to engage in social interactions and experiences that are crucial for emotional development (Diener et al., 2012). Moreover, depression can negatively affect self-esteem and self-image, reducing personal efficacy and increasing the perception of inefficacy in handling vital challenges such as pregnancy and living with HIV (Hidalgo & Rodríguez, 2013). The interface between depression and adherence to antiretroviral treatment is also critical. Depression can compromise treatment adherence, which has direct consequences not only on physical health but also on the perception of personal well-being and the ability to manage pregnancy and HIV proactively. This can reinforce a negative cycle of health and emotional well-being deterioration, further limiting emotional development (Moskowitz et al., 2009). Therefore, it is crucial to recognize the importance of specific interventions that address both mental health and social support in this demographic group. Implementing psychological support strategies and effective social support networks could significantly improve both mental health and emotional development of these young women, providing a more conducive environment for managing HIV and the challenges of adolescent pregnancy (Earnshaw & Chaudoir, 2009; Simoni et al., 2006)

Hypothesis 2, which indicated a positive relationship between Social Support and Emotional Development in pregnant adolescents with HIV, was confirmed. This is due to the significantly high incidence of anxiety

and depression resulting from the multiple stigmatizations they face, both due to their serological status and adolescent pregnancy (Bhana et al., 2016). These disorders not only deteriorate the quality of life but can also compromise adherence to antiretroviral treatment, essential for the health of the individual and the future baby. In this context, social support acts as a crucial buffer against the negative effects of anxiety and depression, fostering more positive and robust emotional development (Cohen & Wills, 1985; Simoni et al., 2006).

An essential aspect of social support is its ability to mitigate the impact of stigma associated with HIV and adolescent pregnancy. This stigma can drastically reduce perceived social support, which in turn negatively affects the emotional and mental health of the adolescents (Earnshaw & Chaudoir, 2009). By providing an environment of support and understanding, social support can significantly improve quality of life and subjective well-being, contributing to better stress management and greater resilience in the face of adversity (Logie & Gadalla, 2009). Moreover, subjective well-being, which involves a positive cognitive and emotional evaluation of life, correlates with greater social support and is associated with better overall health outcomes and greater treatment adherence in people with HIV (Diener et al., 2012; Moskowitz et al., 2009). This subjective well-being facilitates better recognition and management of one's own and others' emotions, which is crucial for the emotional development of pregnant adolescents with HIV.

Hypothesis 3, indicating a negative relationship between Anxiety and Emotional Development in pregnant adolescents with HIV, was also confirmed. Constant anxiety can limit adolescents' ability to process emotions and situations effectively, thereby reducing their ability to develop mature and adaptive emotional responses (Diaz et al., 2013).

The presence of anxiety, especially when intense or persistent, is associated with a decrease in quality of life and can hinder the effective management of pregnancy and HIV itself, compromising both adherence to antiretroviral treatment and proper prenatal care (Hidalgo & Rodríguez, 2013). Robust social support is fundamental in buffering the effects of anxiety and promoting healthy subjective well-being and emotional development (Cohen & Wills, 1985; Earnshaw & Chaudoir, 2009). The lack of this support can exacerbate anxiety, reducing emotional resilience and limiting adolescents' ability to effectively cope with the challenges imposed by their situation. Research has shown that when pregnant adolescents with HIV experience high levels of anxiety, there is a correlation with poorer outcomes in their emotional development. This manifests in a reduced ability to identify and manage their emotions, a crucial skill during pregnancy and HIV management (Bhana et al., 2016). This relationship suggests that interventions aimed at reducing anxiety could be key to improving emotional development in these young women, highlighting the importance of incorporating psychological and social support strategies in care programs (Simoni et al., 2006)

Hypothesis 4, which indicates a positive relationship between Social Well-being and Emotional Development in pregnant adolescents with HIV, was confirmed. According to Earnshaw and Chaudoir (2009), the stigma associated with HIV and adolescent pregnancy can significantly reduce perceived social support, negatively impacting subjective well-being and emotional development. However, when social support is robust, it can serve as a buffer against the effects of anxiety and depression, improving quality of life and subjective well-being (Cohen & Wills, 1985).

Adolescence is a critical stage of personal and social development, and when complicated by pregnancy and an HIV diagnosis, the psychosocial challenges increase. Studies indicate that high levels of subjective well-being, reflecting a positive evaluation of life, are associated with better adherence to antiretroviral treatment and pregnancy management (Moskowitz et al., 2009). This suggests that subjective well-being not only improves physical health but also strengthens emotional development by allowing adolescents to better manage the psychological stress related to their condition. In the Latin American context, where the prevalence of adolescent pregnancies is high and often unplanned, the importance of social support is magnified (Valcárcel et al., 2018) This support can come from family, community, or healthcare providers and has the potential to enhance resilience, reduce the prevalence of anxiety and depression, and foster healthy and adaptive behaviors (Simoni et al., 2006).

Hypothesis 5, which indicates a positive relationship between Quality of Life and Emotional Development in pregnant adolescents with HIV, was also confirmed. The stigma associated with HIV and adolescent pregnancy can significantly reduce quality of life by limiting opportunities to receive adequate social support and negatively affecting mental health. Combating stigma is crucial to improving quality of life and promoting healthy emotional development in these adolescents (Logie & Gadalla, 2009). Studies indicate that a higher quality of life is associated with better levels of subjective well-being, which in turn can buffer the effects of psychological stress caused by pregnancy and HIV (Diener et al., 2012; Moskowitz et al., 2009). Conversely, a decline in quality of life can exacerbate these disorders, and these disorders can further deteriorate quality of life. However, when these emotional disorders are effectively managed, there is an improvement in subjective well-being, leading to better emotional development and a higher quality of life (Bhana et al., 2016; Hidalgo & Rodríguez, 2013).

Implications

The results of this study highlight the critical importance of social support and subjective well-being in mitigating anxiety and depression, factors that negatively impact the emotional development of pregnant adolescents with HIV. Healthcare professionals and social workers should prioritize creating supportive environments that foster a positive climate for these young women. It is recommended to implement group support programs and therapies focused on strengthening social networks and coping skills, specifically designed for adolescents in similar contexts.

This study underscores the need for public policies that comprehensively address the mental health of pregnant adolescents with HIV. It is imperative for governments and public health organizations to integrate mental health services into prenatal and HIV care programs, ensuring easy and stigma-free access. Additionally, policies should promote awareness and education on sexual and reproductive health among adolescents, aiming to reduce unplanned pregnancies and the impact of HIV on this vulnerable population.

The study contributes to the theory of emotional development in pregnant adolescents with HIV by identifying how variables such as quality of life and subjective well-being can effectively buffer against anxiety and depression. This suggests a revision of existing theoretical models to include these elements as central components in predicting emotional development in adolescents facing these complex circumstances.

Limitations

A significant limitation is the cross-sectional nature of the design, which prevents establishing causal relationships between the variables studied. Without being able to determine the direction of the relationships, it is difficult to say whether low subjective well-being leads to poor emotional development or if poor emotional development affects subjective well-being. Longitudinal studies would be necessary to unravel these temporal dynamics and provide deeper insights into causality. Another aspect to consider is the generalizability of the results. Although a significant sample of pregnant adolescents with HIV in Ecuador was included, the findings might not be generalizable to adolescents in different socioeconomic or cultural contexts. Differences in access to health services, social support, and stigma associated with HIV can vary considerably between different regions and countries, which could influence the generalization of the results. Additionally, collecting data through self-administered questionnaires can introduce social desirability bias, where participants may respond in a way that they perceive as favorable. Although measures were taken to ensure confidentiality and anonymity, this bias cannot be completely ruled out. Finally, although validated instruments were used to measure the study variables, relying on self-assessment may not fully capture the complexity of constructs such as subjective well-being and emotional development. Future studies could benefit from incorporating clinical assessments and qualitative interviews that provide a richer and more detailed perspective on these experiences. To address these limitations in future research, it would be advisable to implement longitudinal designs that follow participants over time, thus providing more robust data on causal relationships. Additionally, expanding the research to multiple centers in different cultural and socioeconomic contexts could help validate and extend the applicability of the findings. Incorporating mixed methods, combining quantitative and qualitative approaches, could also enrich the understanding of the issues addressed and provide a more comprehensive picture of the challenges faced by pregnant adolescents with HIV.

Conclusions

This study provides substantial empirical evidence on the predictors of emotional development in pregnant adolescents with HIV, highlighting the significant impact of anxiety, depression, subjective well-being, quality of life, and social support in this vulnerable group. The findings confirm that depression and anxiety have negative effects on emotional development, while robust social support, high subjective well-being, and satisfactory quality of life act as protective factors and promoters of healthy emotional development. The contribution of this study to the field of mental health and HIV research in pregnant adolescents is significant, as it provides a solid foundation for designing interventions aimed at improving emotional and psychological health in this group. Furthermore, it identifies social support not only as a buffer against the adverse effects of anxiety and depression but also as an enhancer of overall well-being and quality of life, which in turn improves emotional development.

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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