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An Exploration of Behavioral Variation in Family and Mental Health of Mothers during Pregnancy. A Case Study of Bethany Women and Family Hospital, Kampala, Uganda

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Abstract

This study was an exploration of behavioral variation in family and mental health of mothers during Pregnancy at Bethany Women's and Family Hospital, offering a balanced perspective on a pressing public health issue. A case study design and qualitative approach was adopted with a sample size of 12 pregnant mothers, 3 healthcare workers and 5 family members enrolled through convenience non-probability sampling and in-depth interviews for gathering qualitative data analyzed thematically. The study findings revealed that family dynamics profoundly shape behavioral variations and mental health among pregnant women at Bethany Women's and Family Hospital. Supportive interactions mitigate stress, while conflicts drive mood swings, withdrawal, anxiety, and depression, reflecting Uganda's unique cultural and economic context. Furthermore, the results showed that strategies like family education, counseling, and community support present a practical, culturally sensitive framework for action, empowering healthcare providers, families, policymakers, and researchers to collaborate on improving maternal well-being. The areas for further discussion ensure that this research remains a catalyst for ongoing inquiry, inviting exploration of longitudinal effects, cultural nuances, and scalable solutions. As Uganda confronts high rates of maternal mental health challenges, this study serves as a clarion call to prioritize pregnant women's psychological health, fostering healthier mothers, stronger families, and thriving communities through a shared commitment to care and understanding.

Keywords: *Family dynamics, Behavior, Mental health, Pregnancy, Women, Biopsychosocial model, Ecological Systems theory*

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1. INTRODUCTION

This study explored the impact of family dynamics on behavioral variations and mental health of pregnant women attending Bethany Women and Family Hospital, Kampala, Uganda. The severity of the mental health challenges undergone by women during pregnancy has become a pressing global concern, with statistics showing that about 10% of pregnant women and 13% of postpartum women experience mental disorders, including maternal depression (WHO, 2024). These challenges are caused by several physical and emotional changes women undergo during pregnancy, which in turn expose them to mental health complications.

Previous studies indicated that these mental health complications during pregnancy can have adverse effects on both the mother and the child (O'Hara & McCabe, 2013). For example, it has been established that women who are depressed or anxious during pregnancy are more likely to encounter premature birth, low birth weight, and postnatal depression (Grote and Bledsoe, 2010). Besides, the children of mothers who have mental health problems during pregnancy are likely to develop behavioral and emotional challenges (Talge et al., 2007). Notwithstanding the enormity of mental health disorders during pregnancy and its devastating impact, much attention has not been paid to pregnant women's mental health globally. In fact, pregnant women in most countries do not have access to mental health services and healthcare givers are not well equipped with the knowledge and tools that enable them to provide proper mental health care (WHO, 2024).

In Africa, the literature indicates that the prevalence of mental health disorders during pregnancy is alarming with about 40% of the pregnant women experiencing depression or anxiety (Heyningen et al., 2016). This is a serious challenge on its own, which requires urgent attention as mental health problems during pregnancy can have adverse effects for both the mother and the child such as preterm birth, low birth weight, and impaired mother-child bonding (O'Hara & McCabe, 2013). The common challenges the African continent has been facing while attempting to address these mental health problems during pregnancy are scarcity of appropriate healthcare facilities and cultural beliefs about mental health (Aderinto et al., 2022).

In East Africa, various studies have shown that pregnant women struggle with some mental health disorders, with 37.68% of pregnant women having depression (Kasujja et al., 2024). This is a serious concern owing to the fact that depression during pregnancy can lead to a devastating health outcome for both the mother and the child, including premature birth, low birth weights, and poor mother-child relationships during infancy (O'Hara & McCabe, 2013). Several authors point out that pregnancy in East Africa is also associated with anxiety, which affects about 30% of pregnant women (Haile et al., 2024). Similarly, Sigalla et al., (2017) examined the role of social support in intimate partner violence (IPV) among pregnant women attending antenatal care in Moshi, Tanzania and discovered that about one-third of the women suffered IPV during pregnancy and most of them suffered multiple incidents of abuse. Despite the several incidents of pregnancy-related mental health disorders experienced by pregnant women in East Africa, there is a scarcity of research considering the impact of family dynamics on behavioral variations among pregnant women which can in turn trigger these mental health challenges. Family dynamics are also crucial in shaping the mental health of pregnant women since the behaviors of family members can influence the mother's variation in behavior, which shapes her mental health status.

In Uganda, mental health disorders during pregnancy are one of the major public health concerns. Research has shown that about one-quarter of pregnant women in Uganda go through depression. This is a staggering statistic and indicates a high necessity for urgent intervention regarding the mental health status of pregnant women in Uganda. Another mental health challenge in Ugandan pregnant women is anxiety. For instance, up to 13% of 501 pregnant women at Mulago National Referral Hospital in Uganda were shown to have experienced anxiety disorders. Moreover, risk factors connected with anxiety disorders were found to include low income, marriage status, spouse relationship, and history of hypertension in previous pregnancies. The research calls for a number of strategies in tackling anxiety disorders specifically during pregnancy, in order to enhance the well-being of both the mother and child (Nabwire et al., 2024). Maternal anxiety during pregnancy can put the baby, as well as the mother's health at risk for conditions like preterm labor, deliveries with low birth weight and postnatal depression (Grote, Swan, & Evans, 2010). Although pregnancy-related mental health disorders are endemic in Uganda, there is a paucity of research exploring the specific behavioral variations due to family dynamics that influence the mental health of pregnant women during pregnancy. Pregnancy is one of the special times in a woman's life as the body undergoes through many changes and is sensitive to different conditions, one of which is the family dynamics which can influence the mental health status of the woman. However, despite this, the impact of family dynamics on perinatal mental health in Uganda has not been investigated comprehensively, hence the need to do further studies in this area.

At the Contextual level, Bethany Women's and Family Hospital is a tertiary specialized hospital based in Kampala Uganda that mainly focuses on the health of women and their families (Bethany Women's and Family Hospital, 2024). Established as a major healthcare facility in Uganda, the hospital has a responsibility to ensure healthy pregnant women in the region. However, despite the fact that the hospital makes many effort to provide adequate antenatal care services, there is limited literature considering the impact of family dynamics on the behavioral variations among pregnant women who attend the hospital and the effect of these behavioral variations on their mental health. Research has shown that family dynamics has a significant impact on the mental health status of pregnant women (Sigalla et al., 2017). However, the specific ways in which family dynamics influence behavioral variations and mental health during pregnancy among women attending Bethany Women's and Family Hospital have not been discovered. Thus, this study addressed this challenge through an exploration of the impact of family dynamics on behavioral variations and mental health of pregnant women attending Bethany Women's and Family Hospital, Kampala, Uganda with a specific goals to investigate the effects of family dynamics on the behavioral variation and mental health of pregnant women at Bethany Women's and Family Hospital, Kampala, Uganda. And lastly, explored effective strategies which may be adopted by healthcare providers and family members to overcome mental health challenges and behavioral variations among pregnant women at Bethany Women's and Family Hospital, Kampala, Uganda. Addressing these concerns was crucial to enhance maternal mental well-being, enhancing family dynamics, improve healthcare practice, developing context-specific solutions,

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contributing to knowledge, informing policy makers, empowering pregnant women, and strengthening interdisciplinary collaboration in handling mental health issues.

2. LITERATURE REVIEW

Theoretical review

Two theories guided this study, namely, the ecological systems theory by Urie Bronfenbrenner (1979) and the biopsychosocial model by George Engel (1977).

The Ecological Systems Theory also referred to as the bioecological model, was developed by Urie Bronfenbrenner in 1979. The theory postulates that human development is influenced by five nested systems: the microsystem, mesosystem, exosystem, macrosystem, and chronosystem (Bronfenbrenner, 1979).

Microsystem refers to the immediate environment in which a person interacts such as family and friends. The mesosystem refers to the interaction between different microsystems, for instance, family and school. The exosystem is an external environment that impacts the individual's life, but which the individual does not directly experience, for instance, the parent's workplace or social services. The macrosystem is the cultural and social environment of the individual. Lastly, the chronosystem captures the time aspect of human development or changes over time (Bronfenbrenner, 1979).

The Ecological Systems Theory has been used frequently by researchers to understand the effect of family or cultural disparities on maternal mental health (MMH). For instance, Noursi et al., (2020) conducted a study to determine the factors affecting racial disparities in maternal morbidity and mortality (MMM) in the United States. The research applied the Ecological Systems Theory to assess the roles of individual, interpersonal, community and societal factors affecting these disparities. The results show that preconception health, access to prenatal care, implicit bias of healthcare professionals, and Medicaid policies affect MMM disparities. Based on the findings, the recommended areas for intervention are the modification of the educational curriculum, improved consultations with different prenatal caregivers, and changes in Medicaid policies.

The ecological systems theory can be used in the case of the behavioral variations and mental health of pregnant women at Bethany Women's and Family Hospital since it provides a framework for understanding the impact of family dynamics on the behavioral variations and mental health of pregnant women. According to the theory, the microsystem (family dynamics) and exosystem (healthcare provider interactions) may affect the behavior and mental health of the individual (pregnant woman).

On the other hand, the Biopsychosocial model introduced by Engel in 1977, posit that health and illness are determined by biological, psychological and social factors (Engel, 1977). The biological component deals with the body and genetic make-up in relation to health and disease. The psychological aspect has to do with the thought, feeling, and behavior of the person. The social component has to do with the external environment of the person such as family, culture, and socioeconomic status (Engel, 1977).

Many authors have used the biopsychosocial model when researching the impact of mental health on pregnancy outcomes. For instance, Grote et al. (2010) undertook a meta-analysis to compare the effects of depression during pregnancy with pregnancy outcomes. This work revealed that prenatal depression was related to preterm delivery, low birth weight, and intrauterine growth restriction.

In the context of behavioral variations and mental health of pregnant women at Bethany Women's and Family Hospital, the biopsychosocial model is particularly relevant as it gives a theoretical foundation for the analysis of the biological, psychological and social factors that may affect the behavioral variation and mental health of pregnant women. The model shows that the biological part (pregnancy), psychological part (mental health), and social part (family relationships, support from the healthcare provider) are interrelated and determine the behavior and mental health of the individual (pregnant woman).

Family dynamics, behavioral variation and mental health of pregnant women

The impact of family dynamics on the behavioral variations and mental health of pregnant women has drawn the attention of many researchers in recent years. For example, Hawkins et al. (2021) conducted a longitudinal study to examine the correlation between the level of family involvement during pregnancy and the psychological well-being of Black pregnant women. The views of pregnant women with regards to their relationship with their family members including partners, maternal family, and paternal family were used in the study. This study found that relationship with family members was positively associated with other parameters of psychological well-being such as self-reported depressive symptoms, perceived stress, pregnancy-related anxiety, and self-identified psychological well-being. More specifically, the research showed that father involvement, maternal family involvement and paternal family involvement are significant predictors of psychological health among Black pregnant women. Of particular interest, the findings were similar for all the gestational ages investigated, thereby supporting the notion that family involvement continues to be a strong predictor of psychological well-being during pregnancy.

Social support has been found to play an important role in maintaining maternal mental health during pregnancy. As a matter of fact, Bedaso et al., (2021) conducted a community-based cross-sectional study on 493 pregnant women in Australia and realized that 7.1 % of them had low social support during pregnancy. This was attributed to mental health issues, stress, low socio-economic status, and being non-partnered. The study is useful in understanding the role of social support during pregnancy and the possible interventions to enhance the mental health and wellbeing of pregnant women and thus useful in the current study on behavioral variation and mental health of mothers during pregnancy at Bethany Women's and Family Hospital, Kampala, Uganda, though it failed to account for the certain roles of social support on behavioral variations among pregnant women. This has been taken care of in the present study.

In another study, Zhang et al. (2020) examined the prevalence of prenatal depression in 605 pregnant women across multiple sites in China using a multisite cross-sectional study. It was ascertained that 28.4% of the pregnant women had prenatal depression, and the risk factors included appearance anxiety and perceived stress while the protective factors included a good relationship with their own mother and resilience. This study is related to the current study since it also focuses on the family relationship and resilience in reducing prenatal depression.

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In addition, a cross-sectional study carried out by Amwonya et al. (2022) in Uganda compared the level of female education and maternal health care utilization. The results of the study revealed a positive relationship between female education and healthcare use. Employing a two-stage least squares (2SLS) model and regression discontinuity design (RDD) to analyze data collected from women in Uganda, the study further revealed that age also plays an important role in determining whether the pregnant mother will access healthcare facilities or not. The study is particularly relevant to the current study owing to the fact that it was conducted in Uganda and that it points out the importance of education, which is a function of family dynamics, in promoting maternal healthcare use, a major determinant of pregnant women's mental health. The present study has extended this to explain the roles of such family dynamics on behavioral variation of pregnant women at Bethany Women's and Family Hospital.

Research has revealed several factors associated with maternal depression during pregnancy. For instance, in a cross-sectional study conducted in Nigeria, Oladeji et al. (2022) explored the degrees of factors associated with depression among 1359 pregnant adolescents and found the prevalence rate to be 18.1%. The study employed the Edinburgh Postnatal Depression Scale (EPDS) and DSM-IV diagnostic criteria to screen for depression in the study. The results showed that young age, single marital status, unemployment, food insecurity were associated with depression, while severity of depression was linked to age, anxiety, disability, quality of life, and pregnancy attitudes. This study focused on the importance of eradicating social disadvantage and poverty in the prevention of depression among pregnant adolescents which is of particular importance in the context of Bethany Women's and Family Hospital in Kampala. It, however, did not focus on the impact of family dynamics on behavioral variations and mental health of pregnant women which was addressed in the current study.

Zhong et al. (2024) carried out a secondary analysis of quantitative data collected from 295 adolescent and young mothers in the United States and revealed that individual level factors such as religious attendance, low perceived discrimination, and high social support; family level factors such as adequate household income and no experience of violence were positively related to family functioning during pregnancy. The research evidence presented in the study implies that there is a possibility of enhancing family functioning and family resilience during pregnancy through the identification of family assets by the healthcare providers. This study is related to the current study because it shows how family functioning and resilience are crucial during pregnancy.

Strategies for mitigating mental health challenges and behavioral variations among pregnant women

It has been established that pregnant women have mental illness and behavioral variations that are unfavorable for both the mother and the child. Hence, authors have not lingered in looking for prevention and treatment measures that will reduce the prevalence of psychological disorders during pregnancy. For instance, Stentzel et al. (2023) conducted a systematic review to establish the telemedicine interventions in regard to mental health related outcomes of pregnant women and postnatal mothers. The review employed 44 articles that were selected based on the criteria for selection which were, telemedicine interventions involving randomized control trials and mental health related aspects. The findings revealed that the majority of the studies (62%) indicated that participants who received telemedicine interventions had significantly better mental health-related outcomes than the control. In detail, the strategy of internet-delivered cognitive behavioral therapy was effective in decreasing the symptoms of depression and stress, as well as peer support for postnatal depression and anxiety. This study is closely related to the current study as it focuses on the use of telemedicine interventions in managing mental health issues among pregnant women and new mothers, given that access to conventional mental health care services may be scarce in low-resource settings.

Going further, Corbally and Wilkinson (2021) performed a systematic review and meta-analysis of mindfulness-based interventions for stress, anxiety, and depression in perinatal women without a history of mental health disorders. The study used six databases and found 12 controlled trials that met the inclusion criteria. The study assessed the quality of the reviewed studies using a tool specifically designed for meta-analyses of mindfulness-based interventions. The results of the study showed that mindfulness-based interventions caused small but clear increases in mindfulness and reductions in depression in women without pre-existing disorders. Nonetheless, the effects of mindfulness-based interventions on other outcomes, such as anxiety and stress, were unclear due to heterogeneity. This study's ability to provide the potential benefits of mindfulness-based interventions in reducing symptoms of depression and improving mindfulness during pregnancy, particularly in women without pre-existing mental health issues, has been a great contribution to the current study.

A cross-sectional study done in tertiary hospitals among 413 pregnant women in Nigeria by Wegbom et al. (2023) examined the factors leading to depression, anxiety and stress. The study used the Depression Anxiety and Stress Scale-21 (DASS-21) and it was found that 9.5%, 26.6% and 17.3% of the respondents had at least moderate depression, anxiety and stress respectively. The results of the study showed that marital status, educational level, and employment status had a significant relationship with depression, while marital status, religion, and trimester had a significant relationship with anxiety. Age, marital status, educational level, religion, income, trimester and previous abortions/miscarriages had a significant relationship with stress. This study is useful in the current study as it focuses on the mental health problems of pregnant women especially in developing countries. However, its failure to address factors affecting behavioral variation among pregnant women was knowledge gap which the current study addressed.

Insomnia during pregnancy have been discovered to affect mental health and behavioral variation among pregnant women. On this note, research has devised effective strategies for tackling it, one of which is the digital cognitive behavioral therapy for insomnia (CBTI). For example, in a randomized controlled trial by Kalmbach et al. (2020), the efficacy of digital cognitive behavioral therapy for insomnia (CBTI) for pregnant women was examined. The study was performed on 91 pregnant women with insomnia and assigned them to either digital CBTI or digital sleep education control. The results showed that digital CBTI had beneficial effects on sleep quality and sleep length during pregnancy and after childbirth, and CBTI patients had a decrease in the severity of insomnia and sleep quality interference. The study's ability to demonstrate that sleep disturbances during pregnancy may affect

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mental health and behavioral variation lends support to the current study.

Group problem-solving therapy (PST) has also been proven helpful for pregnant women with mental health issues. In their recent cohort study, Nakku et al. (2021) evaluated the impact of group PST for perinatal depression on symptom severity and disability in Ugandan women. The study participants included 2652 pregnant women and 153 of them were given a diagnosis of depression. The intervention involved group PST sessions anchored by trained and supervised midwives. The study established a decrease in depressive symptoms assessed by the Patient Health Questionnaire (PHQ-9) and disability assessed by the World Health Organization Disability Assessment Schedule (WHODAS-2.0) at midline and endline. Clinical response was reported at midline by 69.1% and at endline 93.7%. This study is relevant to the current study as it establishes the feasibility of a psychological intervention in decreasing symptoms of depression and enhancing the results of women with perinatal depression in a low-resource setting.

Similarly, Uguz and Ak (2020) did a retrospective cohort study to assess the effectiveness of cognitive-behavioral therapy (CBT) in treating generalized anxiety disorder (GAD) in pregnant women. The study was carried out on 23 pregnant women who had GAD and who underwent CBT and 28 untreated pregnant women with GAD. The study's findings revealed that CBT greatly impacted on maternal mental health by reducing anxiety in pregnant women with GAD. In addition, the study revealed that no adverse effects on gestational age or newborn birth weight were recorded in the course of applying the CBT. This study is quite important for the current study as it indicates that CBT is effective in treating anxiety disorders in pregnant women, which can impact their mental health and behavioral variation during pregnancy.

Studies have also established that social support is an important intervention method of overcoming challenges in mental health among pregnant women. One of such studies is a systematic review and meta-analysis done by Bedaso et al. (2021) which was aimed at examining the association between social support and mental health problems during pregnancy. The study used PubMed, PsycINFO, and other databases to find 67 articles with 64,449 pregnant women. It was found that low social support increases the risks of depression, anxiety and self-harm during pregnancy in a significant manner. In the meta-analysis, the overall odds ratio was 1.18 for low social support for antenatal depression and 1.97 for antenatal anxiety. The relevance of the study to the present study lies in the fact that the study highlighted the role of social support for reducing mental health problems in pregnant women.

3. MATERIAL AND METHODS

This study adopted a case study design through a qualitative approach to conduct an in-depth study on the interlink between behavioral variation in family and mental health of pregnant women who attend Bethany Women's and Family Hospital, Kampala, Uganda. The study population comprised pregnant women, family members and healthcare workers at Bethany Women's and Family Hospital, Kampala, Uganda.

In this study, 12 pregnant women attending antenatal care services at Bethany Women's and Family Hospital, 3 healthcare workers, and 5 family members living with the pregnant women participated in the study. A non-probability sampling procedures called convenience sampling, also known as accidental sampling was adopted. According to Khan (2020), in this technique, researchers select units (such as individuals or items) for inclusion in the sample based on their ease of access who could articulate their experiences as it relates to the problem being investigated.

The primary data was collected by the researchers directly from the participants in Bethany Women's and Family Hospital. An in-depth interview was appropriate. The goal was to obtain detailed information that reflects one's perspective and recommendations on behavioral variation in family and mental health of pregnant women who attend Bethany Women's and Family Hospital. Also, we reviewed related documents and resources such as books, journals, reports, online publications, and other related articles. This was a determining factor to identify the information in the current existence of the study and to evaluate the knowledge of the respondents.

The qualitative data gathered in this study was analyzed thematically. Through this method, we were able to identify, analyze, and interpret qualitative data patterns, common themes, repeated ideas, or emerging recommendations regarding the study objectives.

To ensure ethical conduct, we obtained permission from the management of Bethany Women's and Family Hospital. We respected the respondents' rights and obtained informed consent; ensured sensitive and respectful questioning; maintained respondents' privacy and dignity; promised and observed confidentiality by anonymizing the report; and avoided potential harm or exploitation and ensured voluntary participation.

4. FINDINGS AND DISCUSSION

The findings derived from the qualitative data collected through interviews with pregnant women, family members, and healthcare workers at Bethany Women's and Family Hospital, Kampala, Uganda were presented below.

Family Dynamics, Behavioral Variations and Mental Health

The findings underscore the profound influence of family dynamics on the behavioral variations and mental health of pregnant women at Bethany Women's and Family Hospital. Family dynamics, as defined in this study, encompass the patterns of communication, support, conflict, and roles within the family unit. These dynamics operate within the microsystem of Bronfenbrenner's Ecological Systems Theory, representing the immediate environment that directly impacts an individual's development and well-being. Simultaneously, the Biopsychosocial Model highlights how these social interactions intersect with biological (pregnancy-related changes) and psychological (emotional responses) factors to shape outcomes. This section explored the dual nature of family dynamics as both a protective and risk factor, examined specific behavioral and mental health outcomes, and situated the findings within the broader literature.

Family Support as a Protective Factor

The data revealed that supportive family dynamics serve as a critical buffer against stress and mental health challenges during pregnancy. Pregnant women frequently cited emotional support such as encouragement and empathy from spouses and practical support such as help with household chores as vital to their well-being. For instance, the Participant's statement, "My husband cooks for me when I'm too tired, and it makes me feel cared for," reflects a positive microsystem interaction that fosters resilience.

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This aligns with Hawkins et al.'s (2021) longitudinal study of Black pregnant women in the United States, which found that family involvement, including partner and extended family support, significantly reduced depressive symptoms and pregnancy-related anxiety. Similarly, Bedaso et al.'s (2021) cross-sectional study in Australia identified social support as a protective factor against mental health issues, with low support linked to higher rates of stress and depression.

In the Ugandan context, this protective role is particularly significant given the communal nature of family structures. Many participants lived in extended family households, where support from in-laws or siblings supplemented spousal contributions. Another participant noted, "My sister helps with the children, so I can rest," highlighting how extended family members mitigate the physical and emotional burdens of pregnancy. This finding extends Zhong et al.'s (2024) research on family functioning among young mothers in the United States, which emphasized the role of adequate household support in enhancing resilience. However, unlike Zhong et al.'s focus on individual-level factors like religious attendance, the Ugandan data emphasized collective family efforts, reflecting cultural norms of interdependence.

From a biopsychosocial perspective, supportive family dynamics alleviate psychological stress by reducing the cognitive load of pregnancy-related worries. Biologically, this may lower cortisol levels, mitigating risks like preterm birth, as suggested by Grote et al.'s (2010) meta-analysis linking prenatal depression to adverse birth outcomes. Socially, it reinforces a sense of belonging, countering the isolation often reported in mental health literature (Oladeji et al., 2022). Thus, family support emerges as a multi-dimensional protective mechanism, consistent with both theoretical frameworks and prior empirical work.

Family Conflict as a Risk Factor

Conversely, the findings highlighted family conflict as a significant risk factor for behavioral variations and mental health challenges. Participants described tensions with spouses, in-laws, and other relatives, often stemming from financial pressures, unmet expectations, or cultural norms. The participant's comment, "My mother-in-law insists I work hard despite my condition, and it stresses me out," illustrates how familial demands exacerbate stress. Similarly, Family Member (husband) admitted, "I get frustrated when she's moody, and we argue more now," indicating a bidirectional strain where the pregnant woman's behavior and the family's response create a feedback loop of conflict.

This finding resonates with Sigalla et al.'s (2017) study in Tanzania, which documented high rates of intimate partner violence (IPV) during pregnancy, often linked to poor mental health outcomes. While overt violence was not a dominant theme in this study, verbal conflicts and emotional neglect were prevalent, aligning with Zhang et al.'s (2020) identification of perceived stress as a risk factor for prenatal depression in China. The Ugandan context adds a layer of complexity due to extended family involvement, a macrosystem factor in Bronfenbrenner's theory. Another participant's statement, "Everyone has an opinion about my pregnancy, and I feel judged," reflects how cultural expectations (traditional gender roles) amplify stress, a phenomenon less pronounced in Western-centric studies like Hawkins et al. (2021).

The Biopsychosocial Model elucidates how these conflicts intersect with biological and psychological vulnerabilities. Pregnancy-related hormonal changes may heighten emotional sensitivity, making women more reactive to criticism or neglect. Psychologically, chronic stress from family disputes can precipitate anxiety and depression, as evidenced by the Participant remark, "I worry about money all the time, and my husband doesn't help." This mirrors Nabwire et al.'s (2024) findings at Mulago Hospital in Uganda, where spouse relationships and low income were risk factors for anxiety disorders. The social dimension of strained family ties further isolates women, undermining their coping capacity and exacerbating mental health challenges.

Behavioral Variations Linked to Family Dynamics

Behavioral variations, defined as changes in mood, social interactions, and coping mechanisms, were closely tied to family dynamics. Mood swings were a recurring theme, with Participant stating, "I snap at my kids for no reason, and I hate myself after." This irritability often stemmed from family tensions, such as unmet support needs or arguments, suggesting a direct link between microsystem interactions and behavioral outcomes. Similarly, withdrawal emerged as a coping strategy, as seen in Participant's comment, "I avoid talking to my husband because he doesn't understand my worries." Healthcare workers corroborated these observations, with one Nurse noting, "Some women become quiet or aggressive in clinic visits, especially if their families aren't supportive."

These findings extend the literature by focusing on behavioral manifestations rather than solely mental health diagnoses. While Bedaso et al. (2021) linked low social support to depression, they did not explore behavioral changes like irritability or withdrawal. The current study fills this gap, showing how family dynamics shape not just internal states (anxiety) but also observable behaviors. From an ecological perspective, the mesosystem interactions between family and healthcare settings—amplifies these variations, as unsupportive families may discourage women from seeking help, reinforcing withdrawal. Bio-psychologically, hormonal fluctuations during pregnancy (biological) interact with stress from family conflict (social), triggering mood instability (psychological), a dynamic not fully captured in prior studies like Oladeji et al. (2022).

Mental Health Outcomes

The mental health challenges identified—anxiety, depression, and isolation—were strongly influenced by family dynamics. Anxiety was often tied to financial strain and lack of partner support, as the Participant quote illustrates. Depression emerged from feelings of isolation, with Participant confessing, "I feel alone even with people around me." These outcomes align with Kaggwa et al.'s (2022) estimate of 20% depression and 13% anxiety among Ugandan pregnant women, though the current study highlights family dynamics as a key driver, a focus less emphasized in broader prevalence studies.

The counselor's observation, "Depression is common when family expectations clash with the woman's needs," underscores the tension between individual well-being and collective norms, a macrosystem influence in Bronfenbrenner's framework. This cultural dimension distinguishes the findings from Western studies like Hawkins et al. (2021), where nuclear family structures predominate. The Biopsychosocial Model further explains how biological fatigue, psychological despair, and social disconnection converge to produce these outcomes, reinforcing Grote et al.'s (2010) link between prenatal depression and adverse health consequences.

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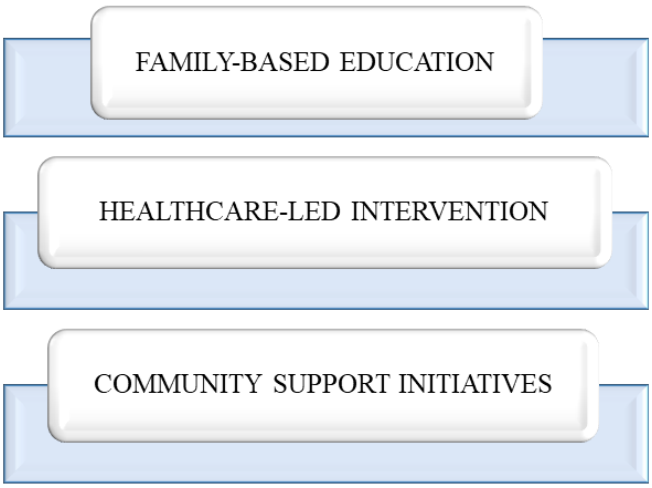
Contextual Nuances in Uganda

The Ugandan context characterized by extended families, economic hardship, and patriarchal norms shapes the impact of family dynamics in unique ways. Unlike Zhang et al.'s (2020) focus on resilience and maternal relationships in China, this study highlights the burden of in-law expectations, a finding specific to communal societies. Similarly, while Amwonya et al. (2022) linked education to healthcare utilization in Uganda, the current data suggest that family attitudes mediate this relationship, with unsupportive families discouraging care-seeking. This interplay of microsystem (family) and exosystem (healthcare access) factors underscores the need for culturally tailored research, addressing a gap noted in the literature review.

In summary, family dynamics exert a dual influence supportive interactions enhance well-being, while conflicts drive behavioral variations, for example, mood swings, withdrawal and mental health challenges (e.g., anxiety, depression). These findings align with global research but offer new insights into the role of extended families and cultural norms in Uganda, enriching the application of ecological and biopsychosocial theories.

Strategies for Mitigating Mental Health Challenges and Behavioral Variations

The second objective of this study was to explore effective strategies for healthcare providers and family members to support pregnant women's mental health and well-being. The findings identified three key approaches: (1) family-based education, (2) healthcare-led interventions, and (3) community support initiatives. This section analyzed these strategies, evaluated their feasibility in the Ugandan context, and compared them with existing interventions in the literature, drawing on the Ecological Systems Theory and Biopsychosocial Model to frame their potential impact.



Family-Based Education

Participants frequently emphasized the need for family education to bridge understanding gaps. Participant's suggestion, "If my husband understood pregnancy better, he'd be kinder," reflects a desire for spouses to recognize the emotional and physical toll of pregnancy. Family Member (mother-in-law) echoed this, stating, "I'd help more if I knew how," indicating that lack of knowledge, rather than unwillingness, often underlies unsupportive behaviors.

This strategy targets the microsystem, aiming to transform family dynamics from a risk to a protective factor. It aligns with Nakku et al.'s (2021) cohort study in Uganda, which demonstrated the efficacy of group problem-solving therapy (PST) facilitated by midwives in reducing perinatal depression. While Nakku et al. focused on women, extending education to families could amplify its impact by fostering empathy and practical support. Globally, Zhong et al.'s (2024) emphasis on identifying family assets supports this approach, suggesting that enhancing family resilience through education improves functioning during pregnancy.

From a biopsychosocial perspective, family education addresses the social dimension by strengthening support networks, potentially reducing psychological stress and mitigating biological risks like elevated stress hormones. However, cultural barriers such as patriarchal attitudes viewing pregnancy as a woman's sole responsibility may hinder uptake. Tailoring content to address gender roles and involving community leaders could enhance acceptability, a consideration absent in Western-centric studies like Hawkins et al. (2021).

Healthcare-Led Interventions

Healthcare workers proposed counseling as a primary intervention, with Midwife suggesting, "We could offer group sessions for families to reduce misunderstandings." This approach leverages the exosystem (healthcare interactions) to influence the microsystem (family dynamics), aligning with Bronfenbrenner's emphasis on interconnected systems. The counselor added, "One-on-one sessions help women process their feelings," highlighting the value of individual support alongside family-focused efforts.

These findings echo Stentzel et al.'s (2023) systematic review of telemedicine interventions, which found that cognitive behavioral therapy (CBT) delivered remotely reduced depression and stress among pregnant women. While telemedicine may be less feasible in Uganda due to limited internet access, in-person counseling adapts this concept to the local context. Similarly, Uguz and Ak's (2020) retrospective study on CBT for generalized anxiety disorder (GAD) in pregnant women demonstrated significant anxiety reduction without adverse birth outcomes, supporting its applicability. The current study extends this by integrating family involvement, addressing a gap in individual-focused interventions.

Bio-psychologically, counseling targets psychological distress (e.g., anxiety) while leveraging social support from healthcare providers, potentially stabilizing biological responses like sleep patterns (Kalmbach et al., 2020). At Bethany Hospital, implementing group sessions could be cost-effective, utilizing existing antenatal care infrastructure serves a bigger and effective intervention. However, challenges include staff training and time constraints, necessitating investment in capacity building, as noted by Wakida et al. (2019) regarding Uganda's mental health service gaps.

Community Support Initiatives

Participants advocated for community-based support, with Participant's suggesting, "A support group for pregnant women would help us feel less alone." This strategy engages the mesosystem interactions between family and community offering a broader support network beyond the immediate household. It aligns with Bedaso et al.'s (2021) meta-analysis, which found that low social support increases risks of depression and anxiety, suggesting that peer groups could counteract isolation.

In Uganda, where communal living is prevalent, community support groups could draw on cultural strengths, such as collective problem-solving, to enhance resilience. This contrasts with Corbally and Wilkinson's (2021) mindfulness-based interventions, which, while effective for depression, require individual discipline

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less suited to resource-limited settings. Nakku et al.'s (2021) success with group PST in Uganda supports this approach, though the current study emphasizes peer-led rather than midwife-led groups, reducing reliance on healthcare staff.

The Biopsychosocial Model highlights how community support addresses social isolation, potentially improving psychological well-being and reducing biological stress markers. Feasibility depends on community buy-in and funding, but leveraging existing women's groups or church networks could minimize costs, a practical adaptation to Uganda's context.

5. CONCLUSION

This study conclusively demonstrates that family dynamics are a pivotal determinant of behavioral variations and mental health among pregnant women at Bethany Women's and Family Hospital. Supportive family interactions, whether through emotional reassurance or practical help mitigate stress, reduce anxiety, and enhance resilience, functioning as a protective shield within the microsystem. For instance, the assistance provided by Participant's husband and sister exemplifies how family support can alleviate the burdens of pregnancy, fostering a sense of security and well-being. In stark contrast, family conflicts fueled by economic hardship, cultural expectations, and extended family pressures drive mood swings, social withdrawal, anxiety, and depression, posing significant risks to maternal health. The experiences of the Participant with her mother-in-law and the Participant with financial worries highlight how these tensions can spiral into psychological distress, a pattern amplified by Uganda's communal living arrangements where extended families play a prominent role.

The proposed strategies of family education, healthcare-led counseling, and community support provide a practical framework to address these challenges. Family education transforms the microsystem into a source of strength by equipping relatives with knowledge and empathy, as evidenced by the calls from Participants for greater understanding. Counseling leverages the exosystem to support both women and families, with Midwife and Counselor suggestions offering a dual approach that can be integrated into existing healthcare systems. Community support groups enhance the mesosystem by fostering peer solidarity, as Participant's endorsement suggests, tapping into Uganda's cultural strengths to combat isolation. These interventions are feasible within Bethany Hospital's infrastructure, building on antenatal care routines and communal values, while addressing the service gaps noted by Wakida et al. (2019). They directly respond to the research questions, delineating the effects of family dynamics and identifying actionable support mechanisms.

Theoretically, the study enriches the Ecological Systems Theory by highlighting the dynamic interplay between microsystem, ecosystem, and macrosystem factors—supportive spouses, healthcare interactions, and cultural norms all converge to shape outcomes. It also extends the Biopsychosocial Model by positioning behavior as a critical link between social inputs and mental health outputs, offering a holistic lens on maternal well-being. Practically, it provides a blueprint for improving mental health in Uganda, with the potential to reduce adverse outcomes like preterm birth and impaired bonding, as noted by O'Hara and McCabe (2013). By focusing on behavioral variations alongside mental health and situating family dynamics within Uganda's socioeconomic and cultural landscape, the study fills critical gaps in the literature, contributing to both local and global discourse. In essence, it underscores the urgency of addressing family dynamics as a public health priority, advocating for a collaborative approach that unites healthcare providers, families, and communities to ensure pregnant women's mental health is a shared responsibility rather than an individual burden.

6. RECOMMENDATIONS

The findings of this study translate into actionable recommendations for stakeholders, presented here in narrative form to guide healthcare providers, family members, policymakers, and researchers in supporting pregnant women's mental well-being.

For healthcare providers at Bethany Women's and Family Hospital, a multi-faceted approach is essential to address the mental health challenges identified. Integrating family-inclusive counseling into antenatal care can significantly enhance support systems, with sessions of 15–20 minutes incorporated into routine visits to educate family members on the emotional and physical demands of pregnancy such as fatigue and mood changes while teaching women stress management techniques like deep breathing. This can be implemented by training midwives and nurses through a one-day workshop led by a mental health specialist, focusing on basic counseling skills and family engagement, utilizing existing clinic rooms to keep costs low and scheduling sessions biweekly to align with patient visits, as inspired by Midwife H2's suggestion and Nakku et al.'s (2021) success with midwife-led therapy. Additionally, developing screening protocols is crucial for early intervention, using a brief tool like the Patient Health Questionnaire-9 (PHQ-9) or Edinburgh Postnatal Depression Scale (EPDS) to identify women at risk of depression or anxiety during check-ups; staff can be trained to administer this in 5 minutes as part of intake forms, referring high-risk cases to counselors, a step supported by Counselor's observation of prevalent depression and global best practices from Oladeji et al. (2022). Facilitating peer support groups further complements these efforts, with weekly 1-hour sessions held in the hospital's waiting area using a peer-led format guided by a facilitator manual covering topics like managing family stress, recruiting volunteers from past patients to sustain the program at minimal cost, as Participant's call for peer support and Bedaso et al.'s (2021) findings on social support's protective role demonstrate its potential.

Family members, as key players in the microsystem, have a vital role in supporting pregnant women, and their involvement can be enhanced through targeted actions. Participating in educational workshops at Bethany Hospital offers a practical way to build understanding, with monthly 2-hour sessions scheduled on weekends, led by midwives using visual aids like charts on hormonal changes and role-playing exercises to practice responding to mood swings, offering refreshments to encourage attendance; this addresses Participant's plea for her husband's empathy and Family Member's willingness to help if informed, echoing Zhong et al.'s (2024) emphasis on family resilience. Providing practical support is another critical step, where families assist with household chores like cooking or childcare to reduce the pregnant woman's burden, creating a rotating schedule among members to ensure consistency and discussing needs openly with her to tailor assistance, as Participant's positive experience with her husband's help illustrates its stress-reducing impact within Uganda's extended family structure. Fostering open

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communication completes this approach, encouraging empathetic, non-judgmental dialogue to address conflicts, setting aside daily 15-minute periods to listen and discuss concerns using phrases like "I see you're upset, how can I help?" to build trust, reducing the strain reported by participants fostering a supportive environment.

Policymakers in Uganda must take broader steps to institutionalize these findings and address systemic gaps in maternal mental health care. Funding maternal mental health programs is a foundational priority, with the Ministry of Health allocating a budget to train healthcare workers and establish services in antenatal clinics nationwide, partnering with NGOs to fund a 3-year pilot program training 500 midwives in counseling and screening, starting with urban hospitals like Bethany, as Wakida et al.'s (2019) critique of limited infrastructure and the study's findings on counseling's potential justify this investment. Promoting public awareness campaigns is equally important to de-stigmatize mental health issues during pregnancy, targeting cultural barriers like family judgment through radio broadcasts and community theater featuring testimonials from mothers and healthcare workers, aiming to reach 80% of Uganda's population within 2 years, addressing participant's experience of judgment and aligning with Aderinto et al.'s (2022) call for cultural shifts. Supporting research initiatives further ensures evidence-based progress, with the provision of $50,000 annual grants through the Ministry of Health prioritizing longitudinal and rural studies over 5 years, responding to the study's urban focus and qualitative nature to build a broader evidence base.

Researchers can extend this work by pursuing rigorous and expansive investigations to validate and broaden the findings. Conducting mixed-methods studies offers a robust approach, combining qualitative insights with quantitative tools like the PHQ-9 or anxiety scales to measure family dynamics' impact, surveying 200 pregnant women at Bethany Hospital over 6 months to correlate family support scores with mental health metrics, addressing Chapter 4's self-report bias limitation and building on Oladeji et al. (2022). Engaging rural populations is another critical direction, replicating the study in rural Ugandan districts with FGDs and interviews among 50 participants over 9 months to compare family dynamics across contexts, analyzing differences in extended family roles to enhance national applicability given the urban-rural disparities noted in the findings. Evaluating interventions completes this effort, piloting family education workshops and counseling with 100 women randomized into intervention and control groups, measuring outcomes like EPDS scores pre- and post-intervention over 12 months to test feasibility and efficacy, as suggested by Nakku et al. (2021), providing empirical support for scaling these recommendations.

7. AREAS FOR FURTHER DISCUSSION

The study's findings and recommendations open several avenues for further discussion, addressing theoretical, practical, and contextual gaps to guide future research and practice.

Longitudinal Impact of Family Dynamics

The snapshot nature of this study leaves the long-term effects of family dynamics unexplored, raising questions about their influence beyond pregnancy. How do supportive or conflictual interactions during pregnancy shape postpartum mental health, parenting styles, or child development? The chronosystem in Bronfenbrenner's theory suggests that time plays a critical role, potentially amplifying the benefits of early support. A 2-year longitudinal study tracking 50 participants from pregnancy through the first year postpartum could test these trajectories, building on Hawkins et al.'s (2021) pregnancy focus to include postpartum outcomes, informing preventive strategies that extend the current findings' impact.

Bidirectional Influence of Behavioral Variations

The bidirectional feedback loop where family dynamics trigger behaviors like irritability, which then strain relationships merits deeper investigation, as it suggests a cycle that could perpetuate mental health challenges. How significant is this dynamic, and could interventions targeting women's behavior, such as mindfulness from Corbally and Wilkinson (2021), reduce family conflict? The Biopsychosocial Model could frame behavior as a mediator, with a mixed-methods study quantifying irritability's impact on family harmony using conflict scales alongside qualitative narratives from 50 families over 6 months. This could refine the conceptual framework, offering a dynamic model for intervention design that addresses both the woman's responses and family reactions.

Cultural Influences on Intervention Uptake

Cultural norms, such as patriarchal authority and extended family roles, shaped the findings, but their effect on intervention success remains unclear, prompting further exploration. Will workshops overcome resistance from in-laws, as Participant's experience suggests, or reinforce traditional expectations? How can counseling address stigma, a barrier noted by Wakida et al. (2019)? A qualitative study with 30 families could explore acceptability over 9 months, testing culturally adapted approaches such as framing mental health as family strength or involving elders as facilitators enhancing intervention design to align with Uganda's social fabric and ensure practical uptake.

Economic Factors and Mental Health

Financial strain's role, evident in Participant's anxiety, suggests a complex interplay with family dynamics that deserves deeper scrutiny. Does poverty amplify unsupportive behaviors, or can strong families buffer economic stress? This extends Oladeji et al.'s (2022) socioeconomic findings, warranting a study with 100 low-income women over 12 months using structural equation modeling to test these relationships. Interventions like microfinance or subsidies could be piloted, assessing whether economic relief reduces family tension and improves mental health, a critical question in Uganda's resource-scarce context that could inform broader policy.

Scalability across Low-Resource Settings

The urban focus raises questions about rural applicability, necessitating discussion on scalability. Can counseling work with fewer healthcare workers, or support groups thrive without infrastructure? Nakku et al.'s (2021) volunteer model suggests potential, but a comparative study across 3 rural and 3 urban sites with 50 participants each over 12 months could assess feasibility. Adapting workshops for illiterate audiences using oral storytelling or leveraging church networks could be explored, positioning the study as a global model for low-resource maternal care, as urged by Aderinto et al. (2022).

Intersection with Physical Health Outcomes

The link between family dynamics, mental health, and physical outcomes like preterm birth (Grote et al., 2010) remains

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speculative, inviting further inquiry. How does Participant's financial anxiety affect her baby's birth weight? A study integrating cortisol levels, birth records, and qualitative data from 50 women over 9 months could test this, fully applying the Biopsychosocial Model. This could guide holistic care at Bethany Hospital, linking mental and physical health interventions to improve maternal and child outcomes.

Role of Healthcare Worker Training

The success of counseling hinges on staff capacity, yet Uganda's training gaps (Wakida et al., 2019) pose a challenge, prompting discussion on preparation. What curriculum perhaps CBT basics or family mediation and delivery method, such as online modules or NGO-led workshops, are optimal? A pilot training of 20 midwives over 6 months, followed by outcome assessment, could answer this, ensuring sustainable implementation. Partnerships with universities or international health organizations could be explored, addressing a practical barrier to the study's recommendations and enhancing healthcare delivery.

Feasibility and Contextual Considerations

The proposed strategies; family education, counseling, and community support are feasible within Bethany Hospital's framework but face contextual challenges. Family education requires cultural sensitivity to overcome resistance from traditional gatekeepers like in-laws. Counseling demands resources for training and space, though integrating it into routine antenatal visits could optimize efficiency. Community support groups are low-cost but need coordination to sustain participation, particularly among women with domestic responsibilities.

Compared to global interventions like digital CBT (Kalmbach et al., 2020), these strategies prioritize in-person, community-driven solutions, reflecting Uganda's infrastructure and cultural realities. They address the literature gap noted in the study, where few studies explored family- and community-based approaches to behavioral variations, offering a model adaptable to other low-resource settings.

8. THEORETICAL IMPLICATIONS

The findings enrich the application of the Ecological Systems Theory and Biopsychosocial Model in maternal mental health research. Bronfenbrenner's framework highlights the microsystem (family) as a primary influence, with exosystem (healthcare) and macrosystem (cultural norms) interactions amplifying its effects. The bidirectional nature of family dynamics where pregnant women's behaviors influence family responses suggests a dynamic system not fully captured in static models, proposing a feedback loop for future iterations.

The Biopsychosocial Model integrates biological (pregnancy), psychological (anxiety), and social (family support) factors, offering a holistic explanation of outcomes. The emphasis on behavioral variations as a bridge between social inputs and mental health outputs extends the model, suggesting behavior as a measurable indicator of well-being. Together, these theories provide a robust framework for understanding and addressing maternal mental health in context-specific ways.

9. LIMITATIONS AND FUTURE DIRECTIONS

The reliance on self-reported data may introduce bias, though triangulation with healthcare worker insights mitigates this. The small sample (20 participants) limits generalizability beyond urban Kampala, suggesting rural studies as a future direction. Cultural sensitivity may have constrained full disclosure, despite confidentiality assurances, indicating a need for longitudinal research to build trust.

Future studies could quantify behavioral variations using scales (e.g., irritability indices) alongside qualitative methods, testing the propose feedback loop between family dynamics and mental health. Exploring postpartum outcomes would extend the findings, addressing the chronosystem (time) in Bronfenbrenner's theory.

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DECLARATION OF INTEREST

The researchers declare no conflict of interest rising from this study.

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