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Exploring the Moderating Role of Parent-Child Relationships in Stress, Depression, and Medication Adherence Among Women Living with HIV

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B.S Public Health
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ABSTRACT

Exploring the Moderating Role of Parent Child Relationships on Stress, Depression and Adherence Among Women Living with HIV

By Sylvie Pascale Prepetit

Background: In the United States, 1.2 million people are living with HIV, with women accounting for 22% of this population. Women living with HIV (WLWH) face unique biological and systemic disparities that persist across multiple levels, which can disrupt consistent medication adherence. For WLWH who have children, parenting can serve as a source of purpose and stress. Parenting stress and potential parent-child conflicts may exacerbate existing mental health challenges and impact on HIV medication adherence.

Purpose: This study explores how parent-child relationships influence stress and depression and their association with HIV medication adherence among WLWH. Guided by the social support theory, this study contributes to a more nuanced understanding of the dual role that children can play, as sources of both social support and stress, in the lives of WLWH.

Methods: A cross-sectional, secondary data analysis was employed with data sourced from the Women's Adherence and Visit Engagement (WAVE), a sub-study of the Women's Interagency HIV Study (WIHS). Parent-child relationship variables were assessed in four categories: child social support, child strain, parental dissatisfaction, and relationship equity. Moderation Analyses were conducted to examine whether these variables moderate the relationship between stress and adherence and between depression and adherence, using a significance threshold of $p \leq 0.05$.

Results: Stress and depression were both significantly and negatively associated with antiretroviral therapy (ART). No interaction terms reached statistical significance, though the interaction in the adjusted model between depression and child strain approached significance ($p = 0.057$). Graphical representations of the interactions in both models suggested that relationship equity and caregiving imbalance may meaningfully shape adherence patterns.

Conclusion: While interaction effects were not statistically significant, notable trends suggest emotional support may buffer stress and depression, whereas child strain may amplify effects of depression. Relationship equity consistently presented as a factor that may warrant further exploration in studies aimed at supporting mothers, so that caregiving responsibilities do not become burdensome and lead to poor self-regulation or adverse health behaviors.

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Chapter 1 Introduction

HIV remains a global public health challenge, affecting approximately 39.9 million people as of 2024, with women accounting for 51% of this population (WHO, 2024). In the United States, this challenge persists, with 1.2 million people living with HIV, of whom 272,360 are women, representing about 22% of the total (CDC, 2024). In the United States, Black and African American women bear a disproportionately high burden, experiencing HIV infection rates were ten times higher than White women and more than three times higher than Hispanic/Latino women (CDC, 2024). For women living with HIV (WLWH), achieving viral suppression is critical to prevent disease progression; however, psychosocial barriers, including stigma, mental health challenges, and socioeconomic stressors, often impede consistent medication adherence (CDC, 2024 & Kedia et al.,2020).

Women living with HIV frequently encounter stigma and social isolation, which can lead to elevated stress and depression. This is especially challenging for mothers living with HIV since they are also balancing caregiving responsibilities with managing a chronic illness (Kim et al.,2021). Parenting itself introduces a unique set of psychosocial stressors, including parenting stress and potential parent-child conflicts, all of which can exacerbate mental health challenges and impact HIV medication adherence (Kim et al.,2021; Jones et al., 2007; Firpo-Perretti, 2018). These factors highlight the need to understand how relationships in parenting affect the well-being of WLWH, particularly regarding their adherence to antiretroviral therapy (ART).

Theoretical Framework: Social Support Theory

Social Support Theory guides the exploration of how parent-child relationships influence psychosocial health outcomes for WLWH. This theory posits that supportive relationships can buffer stress and promote well-being by providing various forms of support, including emotional,

instrumental, and informational (Schaefer et al.,1981; Dorsey et al., 1999). For WLWH, social support can come from family, friends, or healthcare providers; however, children, as sources of both support and potential stress, play a unique role in their lives (Edwards et al., 2012; Cohen & Wills, 1985). Some children may take on caregiving responsibilities, strengthening familial bonds, though at times this role shift may strain both the child and mother (Edwards et al., 2012). Social Support Theory aids in examining the effects of these relationships on maternal mental health, specifically stress and depression, highlighting how strong support can improve coping, provide a sense of belonging, and potentially aid in medication adherence (Dorsey et al., 1999). HIV-positive mothers face complex stressors, from managing personal health to societal stigma and parenting demands (Schaefer et al.,1981). Thus, the theory suggests a pathway where improved mental health, fostered by effective social support through parent child relationships, indirectly promotes better adherence.

Purpose or Problem Statement

The primary issue addressed in this study is the high prevalence of mental health challenges, such as stress and depression, among WLWH and how these conditions impact adherence to HIV medication (Murphy et al., 2010; Gonzalez et al., 2011; Spaan et al., 2018). Despite advancements in HIV treatment, the psychological health of women managing HIV continues to be a critical area of concern. Research points to various stressors, including stigma, financial insecurity, and the dual pressures of parenting while managing a chronic illness, contributing to poor physical and mental health outcomes (Murphy et al., 2010; Antle et al., 2001;Norcini-Pala et al., 2025; Rice et al., 2018).

Current research lacks a thorough exploration of how parent-child relationships might either buffer against or exacerbate psychological health issues for WLWH, specifically regarding

adherence. Additionally, the dual role of children as both supportive figures and potential stress sources in WLWH's lives remains underexplored in terms of its impact on medication adherence.

This study aims to examine parent-child dynamics as moderators between stress, depression, and medication adherence in WLWH. The goal is to determine whether positive parent-child relationships serve as protective factors against these mental health challenges or exacerbate them, ultimately affecting adherence outcomes. This study seeks to provide valuable insights into how understanding the moderating role of parent-child relationships could enhance adherence and, consequently, health outcomes for WLWH.

Research Question 1: How do parent-child relationships moderate the relationship between stress and medication adherence among women living with HIV?

Research Question 2: How do parent-child relationships moderate the relationship between depression and medication adherence among women living with HIV?

Significance of the Thesis Project

This research is vital to public health as it sheds light on holistic aspects of individuals living with HIV, specifically for women and their children. Mothers living with HIV are often underrepresented in clinical studies, and their positionality can significantly impact treatment adherence and long-term health. Understanding the dynamics of mother-child relationships could guide interventions to improve mental health and family support, fostering better health outcomes for WLWH.

This study is innovative in its focus on parent-child relationships as a critical factor in the relationship between psychological health and adherence in WLWH. While previous research has examined psychosocial health within this population, few studies have explored the specific

impact of the parent-child relationship on adherence (Firpo-Perretti, 2018). By applying Social Support Theory, this study will assess how children's roles may mitigate or exacerbate stress and depression among WLWH, influencing adherence.

Definition of Terms

- **Social Support Theory**: A framework that examines how social relationships and perceived support from others influence individual health and well-being.
- **Parent-Child Relationship**: The emotional, social, and caregiving dynamics between a parent and their child, which can impact both the parent's and child's mental and emotional well-being.
- **Women Living with HIV (WLWH)**: Refers to women who are HIV-positive and may face unique health, psychosocial, and caregiving challenges due to their diagnosis
- **Medication Adherence**: The degree to which a patient correctly follows medical advice and adheres to prescribed antiretroviral therapy (ART).

Chapter 2: Review of the Literature

The purpose of this literature review is to examine and synthesize existing research on the complex dynamics of parent-child relationships stress and depression and adherence to antiretroviral therapy among WLWH. This review highlights key studies exploring how these interrelated factors shape the well-being of WLWH, particularly focusing on how parent-child interactions may either buffer or exacerbate mental health challenges, such as stress and depression, which in turn influence treatment adherence. By addressing gaps and integrating current findings on the dual role of children as both sources of support and potential stressors, this review will establish a foundation for understanding how family dynamics impact stress, depression and adherence outcomes in WLWH. This analysis provides context for investigating the moderating role of parent-child relationships in ART adherence, informing future research and potential interventions that can strengthen support for this population.

Background on Women Living with HIV (WLWH)

In the United States, over 1.2 million individuals are living with Human Immunodeficiency Virus (HIV), and approximately 22% of them are women (CDC, 2024). While progress has been made in HIV treatment in recent years, disparities persist in HIV infection and care outcomes among women (Rice et al., 2019). Women face unique biological and systemic barriers, which manifest in challenges related to reproductive health and the underutilization of testing and treatment services (Norcini-Pala et al., 2025 & KFF, 2024). For instance, only 37% of women aged 13 to 65 have ever been tested for HIV (KFF, 2024). These challenges are reflected in low rates of care retention, low viral suppression rates, and a high rate of late diagnoses, highlighting the persistence of gender-specific barriers (KFF, 2024).

WLWH also face challenges that are compounded by their sociodemographic characteristics. In 2022, women accounted for approximately 1 in 5 new HIV diagnoses in the U.S.; however, Black women made up over 50% of those new diagnoses (CDC, 2024). This statistic underscores the palpable racial and ethnic disparities in HIV outcomes. For example, the rate of new HIV infections among Black/African American women was ten times higher than that of white women, and Hispanic/Latina women were three times more likely to be diagnosed than white women in the same year (CDC, 2024).

These disparities fall under the broader umbrella of social determinants of health that contribute to elevated rates of HIV diagnoses among racial and ethnic minority groups. Factors such as socioeconomic status, poverty, and educational attainment all play critical roles (Travaglini et al., 2018). Furthermore, intersecting social and political determinants such as sexism, racism, and classism further shape the experiences of WLWH (Travaglini et al., 2018). This intersectional stigma framework demonstrates how multiple overlapping forms of stigma can compromise women's engagement in care (Norcini-Pala., 2025). Several studies have shown that gender, low-income status, and racism are significantly associated with higher odds of poor ART adherence among women living with HIV (Norcini-Pala., 2025 & Rice et al., 2019).

ART refers to a combination of drugs that target various stages of the HIV life cycle (CDC, 2024). This treatment is essential for the management of HIV and has been proven to significantly improve health outcomes for people living with HIV (Boehme et al.; 2014; Gaston & Alleyne-Green, 2013; Günthard et al., 2016). ART has greatly increased survival rates and reduces the risk of mother-to-child transmission (Spaan et al., 2018 & Kedia & Basu, 2020). Adherence to ART is critical not only for reducing adverse health outcomes but also for improving quality of life and longevity (Spaan et al., 2018 & Kedia & Basu, 2020). Through

consistent adherence, individuals can achieve viral suppression, which decreases morbidity and mortality and prevents sexual transmission of HIV to partners (Spaan et al., 2018). Despite the success of ART in improving health outcomes, a consistent trend of poor ART adherence remains among Black/African American women and other minority women in the United States (Turan et al., 2016; Gaston & Alleyne-Green, 2013). As mentioned earlier, behavioral, social, and environmental factors are associated with suboptimal ART adherence and these factors are further exacerbated among women who are mothers (Turan et al., 2016; DeMoss et al., 2014). The daily stressors faced by women living with HIV, particularly mothers, can interfere with consistent adherence to ART. The demands of caregiving may cause women to de-prioritize their own health needs, increasing the risk of missed doses (Kedia & Basu, 2020). Chronic stressors, including financial hardship, stigma, and caregiving strain, can have a significant impact on the mental health of women living with HIV (Norcini-Pala et al., 2025; Turan et al., 2016). These challenges are often associated with higher levels of depressive symptoms, especially among mothers. There is a growing body of literature suggesting that internalized HIV stigma and depressive symptoms are both associated with poorer ART adherence (Norcini-Pala et al., 2025; Kedia & Basu, 2020; Turan et al., 2016; Katz, 2018). Prolonged exposure to stressors like discrimination, social exclusion, and economic instability, can contribute to elevated stress and depressive symptoms among women living with HIV, which in turn, may lead to suboptimal adherence to ART (Travaglini et al., 2018; Leddy et al., 2019; Turan et al., 2016). The next section will explore in more depth how stress and depression affect women living with HIV, and how these mental health factors may interfere with ART adherence.

Stress and Depression among WLWH

Psychological health outcomes, specifically stress and depression, are significant concerns for WLWH, who are at higher risk for these conditions than the general population. Studies show that WLWH are three times more likely to experience mood disorders and five times more likely to have substance use disorders (Travaglini, Himelhoch, & Fang, 2018). Research has indicated that there was an increase in mental stress among WLWH during the early years of the COVID-19 pandemic, with African American women particularly affected (Prachakul, Grant, & Keltner, 2007). Overall, there is a disproportionate burden of depressive symptoms reported in this population (Edwards et al., 2012; Travaglini et al., 2018; Prachakul et al., 2007).

For example, a study by Levy et al. found that among a sample of 700 WLWH, 28% reported high levels of depressive symptoms (Levy et al.,2020). Depression is a concern for people living with HIV due to the association with HIV infection and major depressive disorder (Ciesla & Roberts, 2001). The mental health burden is especially highlighted among WLWH who are mothers. Women of childbearing age living with HIV are at increased risk for depressive symptoms, particularly if they are single or have low socioeconomic status (Edwards et al., 2012; Dix & Meunier, 2009). Maternal depression can have a large impact on family functioning (Dix & Meunier, 2009). This can manifest in many ways such as maternal withdrawal, ineffective discipline, or negative emotional expression (Dix & Meunier, 2009). Parenting stress among WLWH is also linked to heightened anxiety and depression, as mothers navigate the dual responsibilities of caregiving and managing their own health (Armistead et al., 2019).

Furthermore, chronic stress and trauma are known drivers of HIV disease progression (Levy et al., 2020). The concept of intersectional stigmas, racism, sexism, and classism can lead to chronic stress and lower mental health outcomes in this population (Edwards et al., 2012; Prachakul et al., 2007; Chaudoir et al., 2012). This highlights the need for further interventions to

address mental health among WLWH, a population that is especially vulnerable to psychological distress that can disrupt self-regulation and health management.

As previously mentioned, social determinants of health play a critical role in shaping health outcomes for WLWH. Because HIV disproportionately affects women with intersecting identities, including those of minority racial/ethnic status or low socioeconomic status, women in these social circumstances often experience stressors that differ in both nature and intensity based on context (Edwards et al., 2012; Leddy et al., 2019). For instance, women of lower socioeconomic status may experience chronic stress due to poverty, housing instability, or the ongoing challenges of managing a chronic illness (Edwards et al., 2012; Leddy et al., 2019).

A well-documented source of psychological distress is HIV-related stigma. This stigma can be experienced, anticipated, or internalized (Turan et al., 2016; Rice et al., 2019; Katz, 2018), and it may come from various sources, including family members, healthcare providers, or broader societal perceptions. HIV stigma is a significant predictor of depression (Chaudoir et al., 2012; Katz, 2018). Chronic beliefs related to HIV stigma can contribute to anxiety, distress, and depression (Chaudoir et al., 2012; Katz, 2018). These beliefs can also lead to feelings of low self-esteem or reduced self-worth, further decreasing mental health outcomes (Chaudoir et al., 2012).

Studies indicate that mental health disorders, such as depression and anxiety, are consistently associated with non-adherence to ART, posing risks for viral resistance and treatment failure (Gonzalez, Batchelder & Safre, 2011; Lowther et al., 2014). The mental health challenges, amplified by stigma and limited social support, points to the need to support WLWH in achieving consistent ART adherence and better health outcomes. The relationship between

psychological distress and ART adherence underscores the opportunity to examine how mental health impacts adherence behaviors in WLWH.

Stress, Depression and Adherence to Medication

WLWH encounter a range of health and social challenges that affect their ability to adhere to treatment regimens. Adhering to ART is crucial for managing HIV and preventing disease progression (Boehme et al.; 2014; Gaston & Alleyne-Green, 2013; Günthard et al., 2016). However, there are various barriers that can hinder optimal adherence, especially those related to mental health. As previously described, the high prevalence of depression, stress, and other mental health conditions among WLWH are closely linked to decreased adherence (Gonzalez et al., 2011; Spaan et al., 2018). Symptoms like hopelessness, low motivation, and difficulty concentrating can make it harder to follow consistent medication routines (Spaan et al., 2018; Wagner et al., 2011). Past literature has consistently shown a strong relationship between depression and suboptimal ART adherence. In fact, a meta-analysis found this association to be significant, highlighting how depression can influence behaviors tied to medication-taking (Gonzalez et al., 2011).

Even when depressive symptoms do not meet the threshold for clinical diagnosis, they are still associated with poorer HIV health outcomes in this population (Gonzalez et al., 2011). These symptoms range from reduced interest in daily activities, poor concentration, feelings of worthlessness, and in some cases, suicidal ideation (Spaan et al., 2018; Wagner et al., 2011). All of these can interfere with a person's ability to manage their health and stick to ART regimens. Mental health challenges can be further exacerbated by a lack of social support (Leserman, Perkins & Evans, 1992). Feelings of isolation are common, especially in the presence of intersectional stigma, which includes HIV stigma, racism, and sexism, which can point to

chronic stress over time (Norcini-Pala et al., 2025; Rice et al., 2018). This burden tends to weigh more heavily on women from racial and ethnic/minority groups compared to white women, deepening the disparities in ART adherence seen across different populations (Edwards et al., 2012; CDC, 2024).

Together, these factors paint a picture of how stress and depression play a critical role in shaping adherence behaviors. It is important to address these mental health challenges and explore how protective factors might buffer their negative effects.

Parent-child Relationship Quality as a Moderator in Psychological Health and Adherence

Motherhood is central to a woman's identity, offering as both a source of purpose, resilience and responsibility especially for WLWH (Firpo-Perretti, 2018; Dorsey et al., 1999). Positive relationships with your child can provide strength, pride, and motivation for mothers (Antle et al., 2001; Firpo-Perretti, 2018). Whereas conflictual relationships could represent a source of chronic stress (Firpo-Perretti, 2018; Armistead et al., 2019; Hough et al., 2003). Faced with stress related to their own health and for their children's well-being, WLWH face interesting challenges. Mothers living with HIV often experience stress related to their health and the potential effects on their children, emphasizing the importance of educating professionals about HIV-related family issues (Firpo-Perretti, 2018; Armistead et al., 2019; Hough et al., 2003; Jones et al., 2007). This dual role that children play emphasizes the complexity of how the quality of parent-child relationships can be negative and positive for WLWH.

The emotional and psychological dynamics between mothers and their children are particularly important for WLWH, as parent-child relationship quality may serve as a moderator in the relationship between stress, depression and adherence to HIV treatment (Jones et al., 2007). Positive parenting experience, often described as warmth, support, and equitable relationship

dynamics, can foster resilience and enhance a mother's ability to cope with stress (Antle et al., 2001; Firpo-Perretti, 2018). In contrast, negative or conflictual relationships may amplify psychological distress and reduce motivation to adhere to care routines (Firpo-Perretti, 2018; Armistead et al., 2019).

Studies have shown that negative parent-child relationships are linked to higher levels of stress and depressive symptoms in mothers. In many cases mother-child conflicts are indirectly linked to health-related anxiety through elevated depressive symptoms (Armistead et al., 2019). On the other hand, mothers who describe more positive relationships with their children often report higher self-esteem, greater emotional well-being, and lower depressive symptoms (Jones et al., 2007).

When it comes to ART adherence, the role of parent-child relationships is even more complex. While positive dynamics may enhance adherence through increased motivation or self-worth, some findings suggest that even well-intentioned changes in parenting may inadvertently introduce stress that disrupts self-care routines (Firpo-Perretti, 2018). For instance, increased caregiving time has been associated with improved ART adherence only when the mother-child relationship is positive (Firpo-Perretti, 2018). In contrast, in relationships marked by strain and more caregiving time was linked to better adherence at follow-up, which could reflect a coping or guilt-driven response (Firpo-Perretti, 2018). These nuanced findings emphasize the notion that motivation for adherence can surface from both supportive and challenging relationships. Nevertheless, the underlying emotional context plays a critical role.

Additional moderating factors include parenting self-efficacy, which is a mother's belief in her ability to effectively parent. Among WLWH, parenting-specific support can either be a positive or negative experience, depending on whether it enhances or diminishes that sense of

competence (Dorsey et al., 1999; Forehand et al., 1998). Maintaining parenting responsibilities may reinforce a mother's sense of purpose and efficacy, contributing to better psychosocial outcomes. Conversely, dissatisfaction in parent-child relationships, specifically in the context of adult children, has been associated with worsening psychological distress over time (Reczek & Zhang, 2016; Junttila, Vauras, & Laakkonen, 2007). In contrast, relationship equity, where support is mutual or reciprocal, could provide reduced emotional burden and support mental health stability, because unequal support increases hardships (Reczek & Zhang, 2016; Li, Fok, & Fung, 2011).

In conclusion, parent-child relationship quality is a key contextual factor that can shape how stress and depression influence health behaviors, particularly ART adherence, among mothers living with HIV. As such, interventions that strengthen mother-child relationships, reduce parental stress, and reinforce parenting self-efficacy may have a dual benefit. Interventions focusing on these dynamics have the ability to improve both maternal mental health and HIV-related health outcomes.

Social Support Theory as a Framework

Social Support Theory is fundamental to understanding the unique challenges faced by women living with HIV. WLWH battle multiple chronic stressors, not limited to physical health concerns, but rather ranging from HIV-related stigma, economic instability, and limited access to healthcare (Antle et al., 2001; Norcini-Pala et al., 2025; Rice et al., 2018). Social support plays a key role in mitigating both the psychological and physical consequences of living with HIV (Edwards et al., 2012; Cohen & Wills, 1985).

Supportive relationships can help WLWH manage feelings of fear, depression, and isolation that often accompany an HIV diagnosis (Edwards et al., 2012). Support from family, friends, and

healthcare providers can counter the isolating effects of stigma, fostering self-acceptance and reducing feelings of shame (Ingram et al., 1999). For mothers living with HIV, the burden is often compounded by the stress of caregiving, making social support even more vital. It can provide practical assistance with childcare, emotional encouragement, and a safe space for sharing concerns (Antle et al., 2001).

Social support is consistently linked to improved medication adherence among WLWH (Edwards et al., 2012). Supportive relationships enhance motivation, foster self-efficacy, and reinforce the importance of consistent medication use. Feeling connected to others, especially in emotionally affirming relationships, can strengthen treatment regimens and overall coping (Hudson et al., 2001)

The literature emphasizes the need to distinguish between different types of social support, as each can have unique impacts on health outcomes:

- Tangible (Instrumental) Support: Practical assistance, such as help with transportation or household tasks, is especially important for buffering against depression and improving morale (Schaefer et al.,1981). This form of support has a direct influence on emotional well-being and treatment engagement.
- Informational Support: Providing advice, guidance, or resources helps individuals navigate complex healthcare systems, potentially improving both self-management and ART adherence (Schaefer et al.,1981).
- Emotional Support: Expressions of empathy, trust, love, and validation create a sense of belonging and psychological safety, which are essential for mental health and resilience (Schaefer et al.,1981).

Studies exploring parent-child dynamics reveal that children can function as both sources of support and stress for WLWH. Supportive interactions with children may buffer against stress and improve overall mental health, while strained or conflictual relationships can exacerbate psychological distress (Prachakul et al., 2007; Bekiros, Jahanshahi, & Munoz-Pacheco, 2022). In some cases, children may take on caregiving roles, known as role reversal or parentification (Jones et al., 2007; Edwards et al., 2012). While this could foster closeness, it may also introduce new emotional burdens and blur traditional boundaries in the parent-child relationship (Jones et al., 2007).

Positive parent-child relationships are consistently associated with greater maternal resilience and motivation, potentially enhancing adherence ART (Dorsey et al., 1999; Armistead et al., 2019). Conversely, negative or conflictual interactions can increase maternal stress, reduce emotional well-being, and undermine adherence (Armistead et al., 2019). Understanding the dual role of children, as both a potential buffer against and/or contributor to stress, can help uncover how these relationships influence psychosocial health and treatment behaviors among WLWH.

This study is grounded in Social Support Theory, which emphasizes the role of close interpersonal relationships, such as those between mothers and children, in promoting emotional well-being and influencing health outcomes (Schaefer et al.,1981; Cohen & Wills, 1985). Supportive interactions can enhance coping and foster treatment adherence, whereas strained relationships may intensify psychological distress. Strong social support networks remain one of the most critical protective factors for WLWH (Edwards et al., 2012; Ingram et al., 1999). Emotional support, practical assistance, and a sense of connectedness can help mitigate the damaging effects of stigma and improve coping capacities. In addition, this framework is informed by the Stress-Buffering Hypothesis, which posits that social support not only improves

well-being directly but also moderates the negative effects of stress on health (Bekiros et al., 2022; Cohen & Wills, 1985). This is particularly relevant for WLWH, who often experience intersecting and chronic stressors related to identity, caregiving, and structural barriers.

In this context, social support has been linked to reduced depressive symptoms, improved coping, and better ART adherence. For mothers, children may become important, sometimes unexpected, sources of support. They can offer emotional encouragement, motivation, and even reminders to take medication. However, this dynamic is not always positive. In some cases, role reversals and increased dependency, especially under economic strain, can add stress and blur family roles, potentially worsening maternal health outcomes (Jones et al., 2007; Edwards et al., 2012; Broszormenyi-Nagy & Spark, 1976).

Chapter 3: Methodology

Introduction

This chapter outlines the methodological approach used in this study, including the study design, sampling and recruitment, measures, data collection procedures, and data analysis methodology. The aim was to investigate the moderating the role of parent-child relationships in the association between stress, and separately, depression and medication adherence among WLWH.

Study design

This study employed a cross-sectional, secondary data analysis design to investigate whether and how parent-child relationships moderate the associations between stress and medication adherence, and separately, depression and medication adherence, among WLWH. The data were sourced from the Women's Adherence and Visit Engagement (WAVE) sub-study of the Women's Interagency HIV Study (WIHS) with study sites in San Francisco, CA (University of California, San Francisco); Atlanta, GA (Emory University); Birmingham, AL (University of Alabama at Birmingham) and Jackson, MS (University of Mississippi Medical Center) (Norcini-Pala et al., 2025). The WAVE study collected data on HIV-related stigma and its impact on adherence behaviors. This secondary analysis will focus on understanding how parent child relationships moderate the relationships between stress, depression and medication adherence (Norcini-Pala et al., 2025; Rice et al.,2019; Stringer et al., 2024).

Sampling and recruitment

Participants included adult women aged 18 years and older who were living with HIV and were enrolled in the WIHS cohort. Key eligibility criteria for the original study included a confirmed HIV diagnosis, willingness to provide informed consent, and availability for regular study visits.

For this analysis, inclusion criteria required participants to have complete data on parent-child relationship metrics.

Measures

Stress

Stress was measured using the Perceived Stress Scale (PSS), a self-reported, 10 item instrument meant to assess how individuals perceive situations as stressful and situations as unpredictable, uncontrollable, and overloading (Cohen & Mermelstein, 1983). Items were rated on a 5-point Likert scale ranging from “Never” to “Very Often” (Cohen & Mermelstein, 1983). The PSS is a widely used and validated tool and often used in similar sample demographics examining the health of people living with HIV (Levy et al., 2020). Items were reverse coded as needed, so that total scores indicated higher levels of perceived stress. The scores were summed and left as a continuous variable.

Depressive Symptoms

Depressive symptoms were assessed using the Center for Epidemiological Studies Depression Scale (CES-D), a 20-item self-reported scale meant to measure depressive symptomatology (Radloff ,1977 & Stringer et al., 2024). Responses ranged from 0 to 3, where 0= “Rarely/None of the Time” and 3= “Most or Almost All the Time” (Stringer et al.; 2024). Responses are summed to create a total score that ranges from 0-60, with higher scores indicating greater severity of depression. The measure was treated as a continuous variable in the analysis. The CES-D is a well-established, strong and reliable measure. The CES-D scale is often used in populations with people living with HIV, especially in studies assessing the relationship between depressive symptoms and ART adherence (Levy et al., 2020 & Stringer et al., 2024).

Familial Stigma

Stigma is broadly described as negative attitudes towards individuals, groups which can lead to social exclusion and unfair treatment (Stringer et al.,2024). In this study, familial stigma was analyzed which specifically refers to negative evaluation, discrimination, and prejudice that women living with HIV face from their family members. In this study familial stigma was separated by anticipated and experienced stigma.

Anticipated familial stigma

Anticipated familial stigma examined the expectation of being negatively treated due to one's HIV status by their family members (Rice et al., 2019). Three questions asked how likely it is that people would treat you in the following ways, in the future, because of your HIV status: "1. Family members will avoid me, 2. Family members will look down on me, and 3. Family members will treat me differently." Answer choices ranged on a Likert scale from 1-6, with 1= "Very Unlikely" to 5= "Very Likely" and 6= "No Response", which was recoded as missing in the analysis. Responses were averaged and used as a continuous measure.

Experienced familial stigma

Experienced familial stigma examined past subjection to discrimination, devaluation or prejudice due to their HIV status, by family members (Rice et al., 2019). Similarly, three questions were asked, except this time asking about times in the past people have treated you in certain ways: "1. Family members have avoided me; 2. Family members have looked down on me; 3. Family members have treated me differently." The same 6-point Likert scale was used with "No Response" coded as missing. Responses were averaged and used as a continuous measure.

Parent-Child Relationships

Parent child relationships were measured using a series of questions about aspects of support, communication, and companionship. The questions were adapted from a study by Reczek and Zhang, which utilized 4 waves of the national longitudinal data by Americans' Changing Lives survey which assessed different facets of intergenerational relationships among parents that could cause distress (Reczek & Zhang, 2016). There were 4 facets of parent child relationships: child social support, child strain, parental dissatisfaction (Reczek & Zhang, 2016).

Child social support

Two questions from the WAVE study were used to encompass child social support: "How much does your child make you feel loved and cared for?" and "How much is your child willing to listen to your worries or problems?" Responses ranged from a Likert scale from a "A great deal" to "Not at all." The responses were reverse coded and averaged. Higher values indicated higher levels of child social support.

Child Strain

Child strain was similarly measured using two questions: "How much do you feel your child(ren) makes too many demands on you?" and "How much is [he/she] critical of you or what you do?" These items were rated on a Likert scale from "A great deal" to "Not at all." The responses were reverse coded and averaged. Higher values indicated higher levels of child strain.

Parental Dissatisfaction

Parental dissatisfaction was based on three questions in the WAVE study, which posed "1. At this point in your life, how satisfied are you with being a parent?" 2."How often do you feel upset or bothered as a parent?", and 3."How happy are you with the way your (son/daughter/children) (has/have) turned out to this point?" All three questions were on a 5-

point Likert scale. The responses were averaged with higher values indicating higher levels of parental dissatisfaction.

Relationship Equity

Relationship equity was based on only one question in WAVE, that asked "Right now, would you say you provide more support, advice, and help to your (son/daughter/children), is it about equal, or (does he/does she/do they) provide more to you?" If the parent provided more, it was coded as 1; if there was equal support provided to one other, it was coded as 2; and if the child provided more support, it was coded as 3. For this analysis, the category “equal support” was used as the reference group to analyze how unequal caregiving burden impacted adherence.

Medication Adherence

Medication adherence was evaluated using a 3 item self-reported scale assessing adherence (Wilson et al., 2016 & Stringer et al.,2024). The first question asked, “In the last 30 days, on how many days did you miss at least one dose of any of your HIV medicines?” This question was recoded to be consistent with the later questions where higher values meant higher adherence. The second question asked, “In the last 30 days, how good a job did you do at taking your HIV medicines in the way that you were supposed to?” The final question asked, “In the last 30 days how often did you take your HIV medicines in the way that you were supposed to?” A total adherence score was created with values that ranged from 0-100%, a method proposed by Wilson et al. (Wilson et al., 2016)

Several covariates were examined due to theoretical relevance and based on what the literature suggested to limit confounding: age, income, race, and marital status.

Data collection procedures

The WAVE study collected data through structured interviews and self-report measures (Rice et al., 2019). Trained interviewers conducted in-person assessments at WIHS study sites, where participants completed questionnaires on psychosocial health, discrimination, familial relationships, and medication adherence (Rice et al.,2019). Responses were recorded in REDCap for data management.

Data analysis methodology

The analysis was conducted using SAS statistical software. The primary objective was to examine whether and how parent-child relationships moderate the association between stress, depression and medication adherence among WLWH. Descriptive statistics were calculated to summarize the demographic and clinical characteristics of the study population. The median and interquartile range (IQR) were reported for continuous variables, while frequencies and percentages were used for categorical variables. To explore relationships between predictor variables and adherence, Pearson/Spearman correlation tests were conducted to examine relationships among psychosocial health, parent-child relationship, and adherence. ANOVA tests were conducted to examine categorical variables to examine their relationship with adherence. Moderation analyses were conducted to examine whether parent-child relationships moderate the relationship between stress and adherence and between depression and adherence. Each model included the main effect of either stress or depression, along with the respective interaction term between stress or depression and the parent-child relationship measures. Parent-child relationship variables were assessed across four dimensions: child social support, child strain, parental dissatisfaction, and relationship equity. Model 1 included the interaction between stress and each parent-child relationship measure. Model 2 included the interaction between depression and each

parent-child relationship measure. All variables were included as continuous measures unless otherwise specified. For all models, statistical significance was determined at a p-value threshold of ≤ 0.05.

The WAVE study obtained institutional review board (IRB) approval from participating institutions. This secondary data analysis was deemed exempt from additional IRB review since it used de-identified data.

This methodological approach aims to uncover the intersection between stress and depression, parent-child relationships, and adherence behaviors, contributing to understanding of factors influencing health outcomes among WLWH.

Chapter 4: Results

Introduction

This chapter presents the findings of the study focusing on the two main research questions about whether parent-child relationships moderate the association between stress, and separately, depression, and adherence among WLWH. Results have been broken down into descriptive statistics, bivariate analyses, and moderation analyses. All analyses were conducted using SAS statistical software.

Key findings

Sample Demographic Characteristics

A total of 281 participants met the inclusion criteria for this study. The median maternal age was 53 years. Of these respondents, 67.62% identified as Black/African American women, followed by White (12.1%) and Other racial/ethnic groups (9.25%). In terms of marital status, 37.27% reported being single, 21.71% married/in a relationship, and 28.11% previously married/separated. Nearly half of the sample reported an annual income of $12,000 or less (40.57%). Overall, the study sample had fairly high adherence levels with a median of 92 (IQR= 46, 59). On average, participants reported moderate levels of stress (Mdn= 15.6, IQR = 10, 20) and low levels of depressive symptoms (Mdn = 9.5, IQR= 3,20). *See Table 1 for full sample characteristics*

Bivariate Analyses

When analyzing the association between predictor variables, results varied. Both stress and depressive symptoms were significantly correlated with lower adherence, with correlation

coefficients of r = -0.22 (p = 0.0002) for stress and r = -0.24 (p < 0.0001) for depressive symptoms.

Parent child relationship dynamics were separated into 4 categories, and each were respectively analyzed with adherence. Child social support was positively associated with adherence (r = 0.2, p = .0007) This means that as child social support increases, predicted adherence levels also rose. Child strain was not correlated with adherence (r=0.03, p=0.6). Parental dissatisfaction was positively associated with adherence (r=0.15, p=0.011). Relationship equity did not show any association across all 3 levels (parent provides more support, equal support, or the child provides more support) (F=0.5; p=0.609).

In terms of covariates, the only demographic characteristic associated with adherence was marital status. Marital status was significantly associated with adherence (F=4.27; p = 0.015), with previously married participants reporting the highest adherence with a mean adherence of (91.67). Race was not significantly associated with adherence across all racial/ethnic groups (F=1.93; p=0.147). Income was also not significantly associated with adherence (F=1.12; p=0.34). Age was also not significantly associated with adherence (r=0.01, p=0.86).

Although income and race were included in the bivariate analyses, neither showed significant associations with adherence. As such, income was not included in subsequent moderation models. However, race was retained due to the high proportion of Black participants in the sample and its theoretical relevance to HIV disparities. *See Table 2a/2b for bivariate analyses results*

Moderation Analyses

Moderation analyses examined whether parent-child relationship variables moderate the relationship between stress or depression and medication adherence. All models included race and marital status as covariates.

Stress Models (Crude and Adjusted)

Each model included stress as the primary predictor and a different parenting variable as a potential moderator: Model 1 (child social support), Model 2 (child strain), Model 3 (parental dissatisfaction), and Model 4 (relationship equity). Higher stress was associated with lower adherence in crude Models 1(child social support) and 4 (relationship equity). However, aside from these, no significant interaction effects were observed in either the crude or adjusted models for parent-child relationship variables. *See Table 3a and 4a for full results of the crude and adjusted stress models*

Depressive Models (Crude and Adjusted)

Each model included depression as the primary predictor and a different parenting variable as a potential moderator: Model 1 (child social support), Model 2 (child strain), Model 3 (parental dissatisfaction), and Model 4 (relationship equity). Depressive symptoms were significantly associated with lower adherence in Model 4 (relationship equity) ($p = .010$). No significant interaction effects were found between depression and any of the parent-child relationship variables in the crude and adjusted models. However, the interaction in the adjusted model between depression and child strain approached significance ($p = .057$), indicating a potential moderation effect that may warrant further exploration in future studies. *See Table 3b and 4b for full crude and adjusted stress models*

Other findings

To better visualize the modeled relationships, predicted adherence scores were plotted using a linear model with three levels of each parent-child relationship variable. Due to skewness in the distribution of these variables, the median was used to represent moderate levels, while the 25th percentile and 75th percentile were used to represent low and high levels. These visualizations were created to complement statistical models by illustrating the potential moderating role of parent-child relationship dynamics across varying levels of stress and depression. While moderation effects were not statistically significant, these figures help demonstrate possible trends, especially for child social support and child strain and relationship equity, worth exploring in future work. *See Figures 2-6 for visualized models*

Chapter 5: Discussion, Public Health Implications, and Conclusions

Introduction and summary of study

This study explores how parent-child relationships influence stress and depression and their association with HIV medication adherence among women living with HIV. Positive parent-child relationships are often linked with resilience and motivation, which may promote adherence to antiretroviral therapy, while negative interactions (or the overall responsibility of motherhood) may contribute to increased psychological distress and lower adherence (Dorsey et al., 1999; Armistead et al., 2019). This study contributes to a more nuanced understanding of the dual role that children can play, as sources of both social support and stress, in the lives of WLWH.

Key Results

One of the most unexpected findings in this study is the lack of significant associations between race and adherence, which contrasts with much of the existing literature. Many frameworks in HIV research highlight racial disparities in health outcomes, particularly among Black women (CDC, 2024; Travaglini et al., 2018). Especially with black women encompassing well over 50% of new HIV cases, which is consistent with the disparities that the literature has pointed out (CDC, 2024). However, in this sample, race did not appear to play a significant role. This result may reflect the homogeneity of the sample, since 67.62% of the sample identified Black/African American, or indicate that other factors play a stronger role in adherence in this context. This was similarly the case with income, which also showed no significant association with adherence. This finding diverges from previous research that links low socioeconomic status or economic instability with suboptimal ART adherence (Travaglini et al., 2018; Edwards et al., 2012; Dix & Meunier, 2009). While 40.57% of the sample has an annual income of less than

$12,000, this association does not seem to interfere with how women living with HIV adhere to their medication in this sample. This could be due to the fact that in this sample, women have a relatively high adherence baseline level, with a median adherence of 92 overall. Since there is not much variation in these adherence levels in this population, these associations may not have a large effect.

This study aligns with prior research suggesting that parent-child relationships can serve as both protective and risk factors for mental health among WLWH (Edwards et al., 2012; Ingram et al., 1999). Supportive relationships with children may buffer the effects of stress, leading to better adherence and mental health outcomes, while strained or role-reversed relationships, where children take on caregiving roles could lead to opposing effects (Prachakul et al., 2007 ; Bekiros, Jahanshahi, & Munoz-Pacheco, 2022). These dual roles highlight the complexity of family dynamics in the context of chronic illness. However, for this study, none of the interaction effects between stress and adherence or depression and adherence were found to be statistically significant.

Although the interaction effects were not statistically meaningful, this is where the visual figures offer additional value. Visually, there were observable differences among the three levels for most of the parent-child relationship variables and predictors. While not statistically significant, several compelling trends emerged in the graphical representations of the interactions.

The interaction between stress and child social support (see Figure 2) in the adjusted model visually demonstrated how high support could protect against stress related drops in adherence. While all groups experience a decline in adherence as stress increases, the slope is steeper among women with lower child support. Women with high support maintain stable adherence, even at higher stress levels. Although the interaction was not statistically significant (p = .0.195), this

pattern aligns with the Stress-Buffering Hypothesis, which suggests that supportive relationships with children may buffer the negative effects of stress on ART adherence (Bekiros et al., 2022; Cohen & Wills, 1985). A similar, non-significant trend (see Figure 3) was also observed for depressive symptoms, where high child support lessened the negative association between depression and adherence.

The interaction between depression and adherence in the adjusted model demonstrated how high child strain exacerbates the link between higher depression and lower adherence levels (see Figure 4). While all three levels of child strain illustrate a reduction in adherence levels as stress increases, there is a notably steeper decline in adherence among women with high strain. This suggests that child strain exacerbates the effects of depression which highlights the importance for specialized intervention design.

Relationship equity analyses revealed the most convincing trends for both the stress and depression models in the graphical representations. The interaction involving stress, relationship equity and adherence, depicted a strong visual divergence, specifically for the category of "Parent Provides More Support" (see Figure 5). The graph presented a steep drop in predicted adherence as stress increases in this group. This could suggest that imbalance caregiving dynamics could decrease adherence under stress. The interaction between depression, relationship equity and adherence mirrored the trend described between stress, relationship equity and adherence (see Figure 6). Again, the "Parent Provides More Support" fared worse in comparison to the other levels of relationship equity. This consistent trend among both models suggests caregiving imbalance could be a meaningful psychosocial stressor among WLWH in this sample (Reczek & Zhang, 2016; Li et al., 2011).

While these interactions were not statistically significant, this does not mean that they do not have theoretical or practical importance. Emotional support seems more protective under stress, whereas child strain may amplify the effects of depression. The most consistent and compelling trends across both mental health predictors involved relationship equity, which may warrant further exploration.

However, it is important to clarify that while the relationship equity demonstrated that caregiving imbalance could be a point of suboptimal adherence among WLWH, this study does not advocate for transferring caregiving responsibility to the child. Many studies have documented how role reversal can lead to negative child effects (Jones et al., 2007; Edwards et al., 2012). Research suggests that when children are relied heavily on emotional support or practical support, this is often referred to as parentification (Jones et al., 2007). These negative effects can lead to the loss of childhood, identity formation, and decreased well-being (Jones et al., 2007; (Broszormenyi-Nagy & Spark, 1973).

What this study aimed to highlight is the need to consider individuals holistically. A person living with HIV is not just a patient, they may also be a woman, a mother, a partner, and part of a racial or socioeconomic group, all of which shape their lived experiences. These intersecting identities can compound stress and affect health behaviors such as medication adherence. Viewing WLWH through a holistic and intersectional lens helps ensure that they feel seen and supported and may lead to better health outcomes. In this case, a mother living with HIV may experience stress and depressive symptoms for a multitude of reasons. Public health interventions could focus on soothing, comforting, and supporting mothers as part of or in addition to other HIV prevention and treatment efforts.

Strengths and Limitations

A major strength of this study is its focus on parent-child relationships in the context of ART adherence among WLWH. This dynamic is less explored but is a highly relevant form of social support for WLWH. This study is grounded in well-established theories like the Social Support Theory and the Stress Buffering Hypothesis which align well with the study design. While previous studies have examined general social support, few have specifically looked at the role of children, who often serve unique emotional, logistical, and social roles in the lives of their mothers.

However, the study also has several limitations. One limitation is the absence of data on the age of the children. The nature and quality of support provided by a child can vary significantly depending on their age, developmental stage, and living arrangements. Parent-child relationship quality items were validated in a study for adult children, but applied here to a broader age range since parents with children both under and over the age of 18 were included in this study Furthermore, while the study aims to examine whether parent-child relationships buffered the impact of stress and depression on adherence, it did not directly measure the nature or quality of emotional support provided by children. This makes it difficult to fully capture the mechanism by which the relationship could influence adherence. Future research should consider more targeted items or qualitative data to capture the depth of these interactions.

Implications for public health research and practice

Despite limitations, this study highlights important implications for public health. HIV continues to pose a major public health challenge, particularly among marginalized women, and recent reductions in funding for HIV research threaten to reverse years of progress.

Due to recent administration changes and a goal of reducing staff by 20 percent at the Department of Health and Human services, many divisions at CDC were eliminated and programs specifically related to HIV and AIDS were strongly damaged (Choi, 2025). The Office of Infectious Disease and HIV/AIDS Policy (OIDP) lost all their employees; the National Center for HIV, Viral Hepatitis, STD, and Tuberculosis Prevention, and the Global Center Division of Global HIV and TB lost about 20% of their employees (Choi, 2025). In addition, within the CDC's division that focuses on HIV prevention, five branches were eliminated resulting in the loss of surveillance, research and communication practices (Choi, 2025).

Despite these institutional changes, the threat of HIV and AIDS persists and continues to impact vulnerable communities. These budgetary reductions and restructuring efforts are not reflective of the ongoing public health need. There remains a critical demand for continued research, surveillance, and support systems to improve health outcomes for people living with HIV. WLWH continue to face substantial barriers to ART adherence. Gender disparities persist, driven by both biological and systemic challenges, including those related to reproductive health, stigma, caregiving responsibilities, and underutilization of testing and treatment services (Norcini-Pala et al., 2025 & KFF, 2024). These barriers are reflected in lower rates of care retention, reduced viral suppression, and a higher rate of late-stage diagnoses among WLWH (KFF, 2024).

Public health interventions ought to consider the family context in which WLWH manage their condition. Programs that include family-based or intergenerational support may be more effective in fostering adherence. Integrating family dynamics into culturally responsive and community driven-care models could prove to be important for WLWH. Using age-specific and developmentally appropriate measures of parent-child dynamics could allow for more statistical

power and generalizability among children under the age of 18. Conducting a qualitative study or integrating qualitative data on parent-child relationships could help to understand the nuances of support and strain.

Although this study did not yield strong statistical significance in interaction models, it contributes to a growing body of research that recognizes the complexity of HIV adherence and highlights the need for family-centered, culturally responsive interventions.

Conclusions

This thesis contributes a unique perspective on how parent-child relationships may influence medication adherence and psychosocial health in WLWH. While findings related to the primary research questions are not significant, the study highlights the importance of looking past individual-level factors but to include relational and familial dynamics. Future research should expand on these findings by incorporating more comprehensive measures of family support and examining the role of children across developmental stages. This supports the potential for the development of targeted interventions that promote holistic well-being among women managing HIV within the context of motherhood.

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Appendices

Appendix A. Tables

Table 1 Sample Descriptive Statistics

	Overall N=281
Study Site Location, n (%)	
Birmingham, AL	52, (18.51)
Jackson, MS	55, (19.57)
San Francisco, CA	72, (25.62)
Atlanta, GA	102, (36.30)
Age, median (IQR)	53, (46, 59)
Marital Status, n (%)	
Married/in a relationship	61, (21.71)
Previously married/ Separated	79, (28.11)
Single	105, (37.27)
Race, n (%)	
White	34, (12.10)
Black/ African American	190, (67.62)
Other	26, (9.25)
Income, n (%)	
12,000 or less	114, (40.57)
12,001-24,000	63, (22.42)
24,001-36,000	31, (11.03)
36,001 or more	37, (13.17)
Adherence, median (p25, p75)	92, (84, 100)
Perceived Stress, median (p25, p75)	16, (10,20)
Depressive Symptoms, median (p25, p75)	9.5, (3,20)
Familial stigma, median (p25, p75)	
Experienced familial stigma	1, (1, 1.6)
Anticipated familial stigma	2, (1,3)
Parent Child Relationship, median (p25, p75)	
Child social support	4.5, (3.5, 5)
Child Strain	3.5, (3, 4.5)
Parental Dissatisfaction	4.2, (3.67, 4.67)
Relationship Equity, n (%)	
Parent Provides more support	105, (37.37)
Equal level of support	150, (53.38)
Child provides more support	26, (9.25)

Notes: Missing data affected only select variables; therefore, percentages may not sum to 100% for all categories. See Table 1a for missing data patterns.

Table 1a. Missing Values

	n	%
Age	29	10.32
Marital Status	36	12.81
Race	31	11.03
Income	36	12.81
Adherence	25	5.35
Depressive Symptoms	3	1.07
Familial stigma		
Experienced familial stigma	1	0.36

Table 2a Correlations Between Continuous Predictors and Adherence

	Pearson *r*	p-value
Age	0.01	0.86
Perceived Stress	-0.22	0.0002
Depressive Symptoms	-0.24	<.0001
Child social Support	0.2	0.0007
Child Strain	0.03	0.6
Parental Dissatisfaction	0.15	0.011

Table 2b. Mean Differences in Adherence by Categorical Predictors

	n	Mean ADH, (SD)	DF	Mean Square	F value	p-value
Race			2	439.07	1.93	0.147
White	34	93.76, (8.2)				
Black	190	88.29, (16.4)				
Other	26	89.88, (11.17)				
Marital Status			2	964.24	4.27	0.015
Married/in a relationship	61	91.18, (9.05)				
Previously married/separated	79	91.67, (17.03)				
Single	169	85.8, (16.14)				
Income						
12,000 or less	114	88,71, (14.19)	3	260.34	1.12	0.34
12,001-24,000	63	88.57, (18.96)				
24,001-36,000	31	86.77, (13.10)				
36,001 or more	37	93.05, (12.6)				
Relationship Equity			2	108.34	0.5	0.609
Parents provide more support	105	88.51, (17.23)				
Equal level for support	150	90.04, (12.93)				
Child provides more support	26	87.65, (13.78)				

Table 3a Crude Stress Models

Predictors	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Stress	-1.01 (-1.97, -0.05) p=0.038	-0.03 (-0.8, 0.72) p=0.923	-0.8 (-1.99, 0.38) p=0.183	-0.44 (-0.74, -0.13) p=0.005
Child Social Support	-0.73 (-5.13, 3.66) p=0.743			
Stress*****Child Social Support	0.16 (-0.61, 0.38) p=1.55			
Child Strain		1.47(-2.12, 5.06) p=0.422		
Stress***** Child Strain		-0.11 (-0.3, 0.09) p= 0.29		
Parental Dissatisfaction			0.63 (-6.27, 5.01) p= 0.826	
Stress *****Parental Dissatisfaction			0.11 (-0.18. 0.39) p= 0.456	
Relationship Equity				
Equal support *(Ref)*	*Ref*	*Ref*	*Ref*	*Ref*
Parent Provides More				-0.59 (-8.77, 7.59) p=0.887
Stress*****Parent Provides More				0.10 (-0.57, 0.38) p= 0.691
Child Provides More				-8.65 (-21.26, 3.97) p= 0.178
Stress*****Child Provides More				0.38 (-0.34, 1.11) p=0.298
	R^2: 0.08	**R^2**: 0.05	**R^2**: 0.06	**R^2**: 0.06
	F-value: 7.55	**F-value**: 5.18	**F-value**: 5.43	**F-value**: 3.51
	Model p value: <.0001	**Model p value**: 0.0017	**Model p value**: 0.0012	**Model p value**: 0.0043

Table 3b Crude Depression Models

Predictors	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Depression	-0.44 (-1.06, 0.17) p=0.158	0.04 (-0.48, 0.57) p=0.869	-0.25 (-0.98, 0.48) p=0.502	-0.26 (-0.46, -0.06) p=0.010)
Child Social Support	1.39 (-1.45, 4.22) p= 0.337			
Depression*****Child Social Support	0.05 (-0.10, 0.19) p= 0.541			
Child Strain		0.1 (-1.34, 3.34) p=0.401)		
Depression***** Child Strain		0.10 (-0.24, 0.04) p=0.158)		
Parental Dissatisfaction			1.34 (-2.19, 4.89) p=0.456	
Depression *****Parental Dissatisfaction			0.01 (-0.19, 0.18) p=0.941	
Relationship Equity				
Equal support *(Ref)*	*Ref*	*Ref*	*Ref*	*Ref*
Parent Provides More				1.08 (-4.3, 6.46) p=0.693
Depression*****Parent Provides More				-0.24 (-0.56, 0.08) p=0.146)
Child Provides More				-6.0 (-14.68, 2.68) p=0.175
Depression*****Child Provides More				0.27 (-0.27, 0.82) p=0.324
	R^2: 0.07	**R^2**: 0.06	**R^2**: 0.06	**R^2**: 0.08
	F-value: 7.61	**F-value**: 6.34	**F-value**: 6.02	**F-value**: 4.50

Model p value: <.0001	**Model p value**: 0.0004	**Model p value**: 0.0006	**Model p value**: 0.0006

Table 4a Adjusted Stress Models

Adjusted for Race and Marital Status

Predictors	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Race				
Black	-4.95 (-10.38, 0.47) p=0.07	-4.7 (-10.2, 0.8) p= 0.094	-5.05 (-10.57, 0.46) p=0.072	-5.10 (-10.60, 0.41) p=0.069
Other	-4.89 (-12.39, 2.61) p=0.2	-4.02 (-11.64, 3.61) p=0.301	-4.58 (-12.23, 3.06) p=0.239	-5.34 (13.0, 2.30) p=0.170
White *(Ref)*	*Ref*	*Ref*	*Ref*	*Ref*
Marital Status				
Previously married/separated	1.63 (-12.39, 2.61) p=0.512	1.39 (-3.57, 6.36) p=0.581	1.1 (-3.86, 6.06) p=0.662	0.69 (-4.30, 5.67) p= 0.786
Single	-4.31 (-9.93, 0.31) p=0.068	-4.23 (-8.95, 0.48) p=0.078	-4.6 (-9.3, -0.09) p=0.055	-5.39 (-10.12, -0.65) p= 0.026
Married *(Ref)*	Ref	Ref	Ref	Ref
Stress	-0.95 (-1.96, 0.06) p=0.048	0.1 (-0.73, 0.92) p=0.817	-0.54 (-1.80, 0.71) p=0.395	-0.37 (-0.70, 0.04) p=0.029
Child Social Support	-0.01 (-4.67, 4.69) p=0.997			
Stress*****Child Social Support	0.14 (-0.08, 0.39) p=0.195			
Child Strain		1.65 (-2.28, 5.58) p= 0.409		
Stress***** Child Strain		-0.14 (-0.36, 0.07) p= 0.187		
Parental Dissatisfaction			0.85 (-5.16, 6.86) p=0.781	
Stress *****Parental Dissatisfaction			0.05 (-0.25, 0.35) p=0.733	
Relationship Equity (Reference= Equal)				
Equal support *(Ref)*	*Ref*	*Ref*	*Ref*	*Ref*

Parent Provides More				1.46 (-7.58, 10.51) p= 0.750
Stress*****Parent Provides More				-0.28 (-0.80, 0.24) p=0.291
Child Provides More				-9.77 (-22.99, 3.44) p=0.147
Stress*****Child Provides More				0.36 (-0.40, 1.12) p= 0.347
	R^2: 0.13 **F-value**: 4.88 **Model p value**: <0.00011	**R^2**: 0.10 **F-value**: 3.76 **Model p value**: 0.0007	**R^2**: 0.1 **F-value**: 3.64 **Model p value**: 0.0009	**R^2**: 0.11 **F-value**: 3.23 **Model p value**: 0.0010

Table 4b. Adjusted Depression Models

Adjusted for Race and Marital Status

Predictors	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Race				
Black	-4.57 (-10.05, 0.90) p=0.101	-4.03 (-9.54, 1.47) p=0.15	-4.45 (-10, 1.11) p=0.116	-4.23 (-9.74, 1.28) p= 0.131
Other	-4.11 (-11.75, 3.53) p= 0.291	-3.40 (-11.10, 4.30) p=0.385	-3.76 (-11.48, 3.96) p=0.339	-4.50 (-12.20, 3.19) p= 0.250
White *(Ref)*	*Ref*	*Ref*	*Ref*	*Ref*
Marital Status				
Previously married/separated	1.49 (-3.44, 6.43) p=0.552	1.45 (-3.55, 6.45) p= 0.569	1.03 (-3.95,6.01) p=0.685	0.90 (-4.10, 5.91) p= 0.723
Single	-4.43(-9.12, 0.26) p=0.064	-4.40 (-9.14, 0.34) p= 0.069	-4.74 (-9.49, -0.0) p=0.05	-5.50 (-10.28, -0.73) p=0.024
Married *(Ref)*	*Ref*	*Ref*	*Ref*	*Ref*
Depression	-0.40(-05, 0.24) p= 0.221	0.26 (-0.34, 0.85) p=0.392	-0.05 (-0.84, 0.73) p=0.896	-0.21 (-0.42, 0.01) p= 0.062
Child Social Support	2.11 (-0.92, 5.14) p=0.172			
Depression*****Child Social Support	0.05 (-0.11, 0.20) p=0.557			
Child Strain		1.26 (-1.33, 3.84) p=0.339		
Depression***** Child Strain		-0.15 (0.31, 0.00) p= 0.058		
Parental Dissatisfaction			2.48 (-1.31, 6.27) p=0.199	
Depression *****Parental Dissatisfaction			-0.05 (0.25, 0.15) p=0.637	

Relationship Equity				
Equal support *(Ref)*	*Ref*	*Ref*	*Ref*	*Ref*
Parent Provides More				1.20 (-4.71, 7.10) p=0.691
Depression*****Parent Provides More				-0.33 (-0.68, 0.02) p= 0.066
Child Provides More				-6.89 (-16.02, 2.24) p= 0.138
Depression*****Child Provides More				0.22 (-0.37, 0.82) p= 0.461
	R^2: 0.12	**R^2:** 0.11	**R^2**: 0.10	**R^2**: 0.12
	F-value: 4.70	**F-value**: 3.99	**F-value**: 3.72	**F-value**: 3.57
	Model p value <.0001	**Model p value**: 0.0004	**Model p value**: 0.0008	**Model p value**: 0.0004

Appendix B. Figures

Figure 1. Study Moderation Model

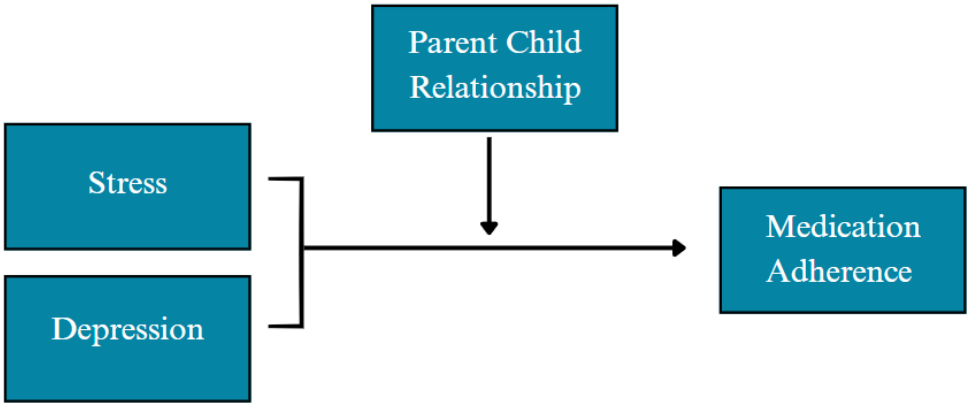

Figure 2. Interaction between Stress and Child Social Support

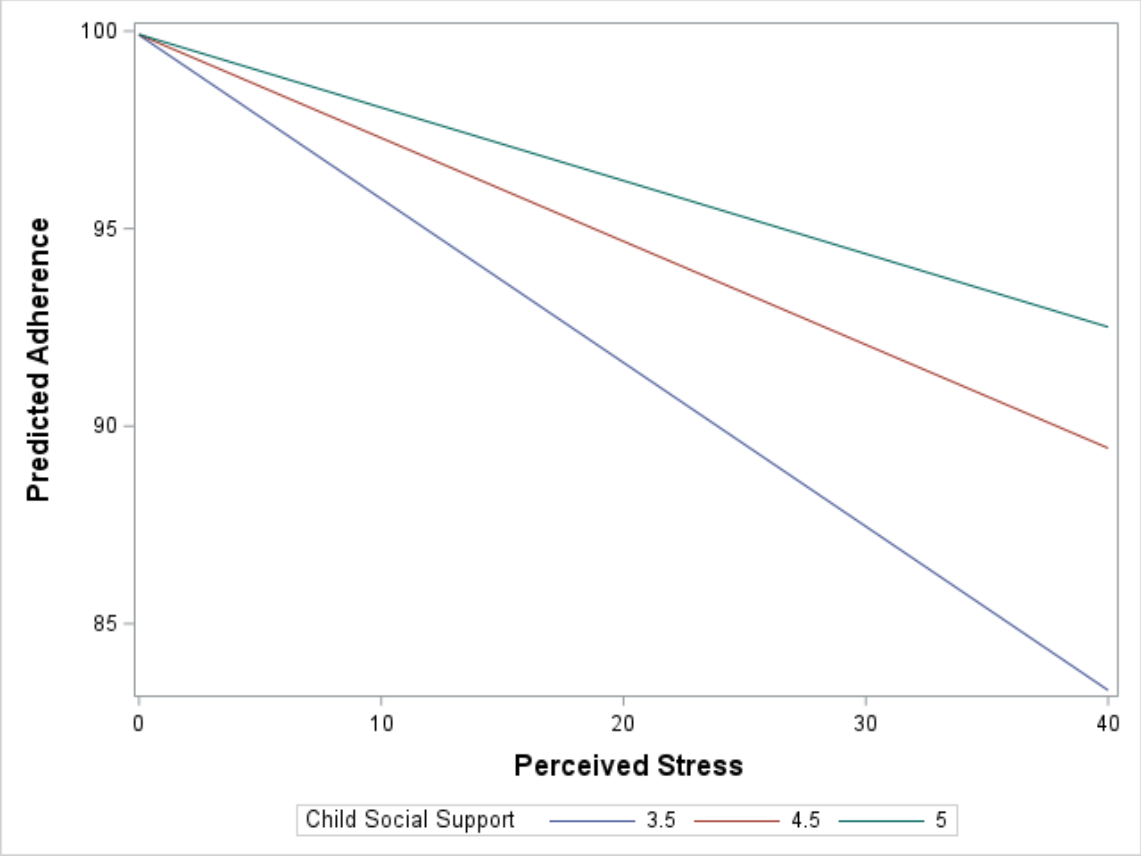

Figure 3. Interaction between Depression and Child Social Support

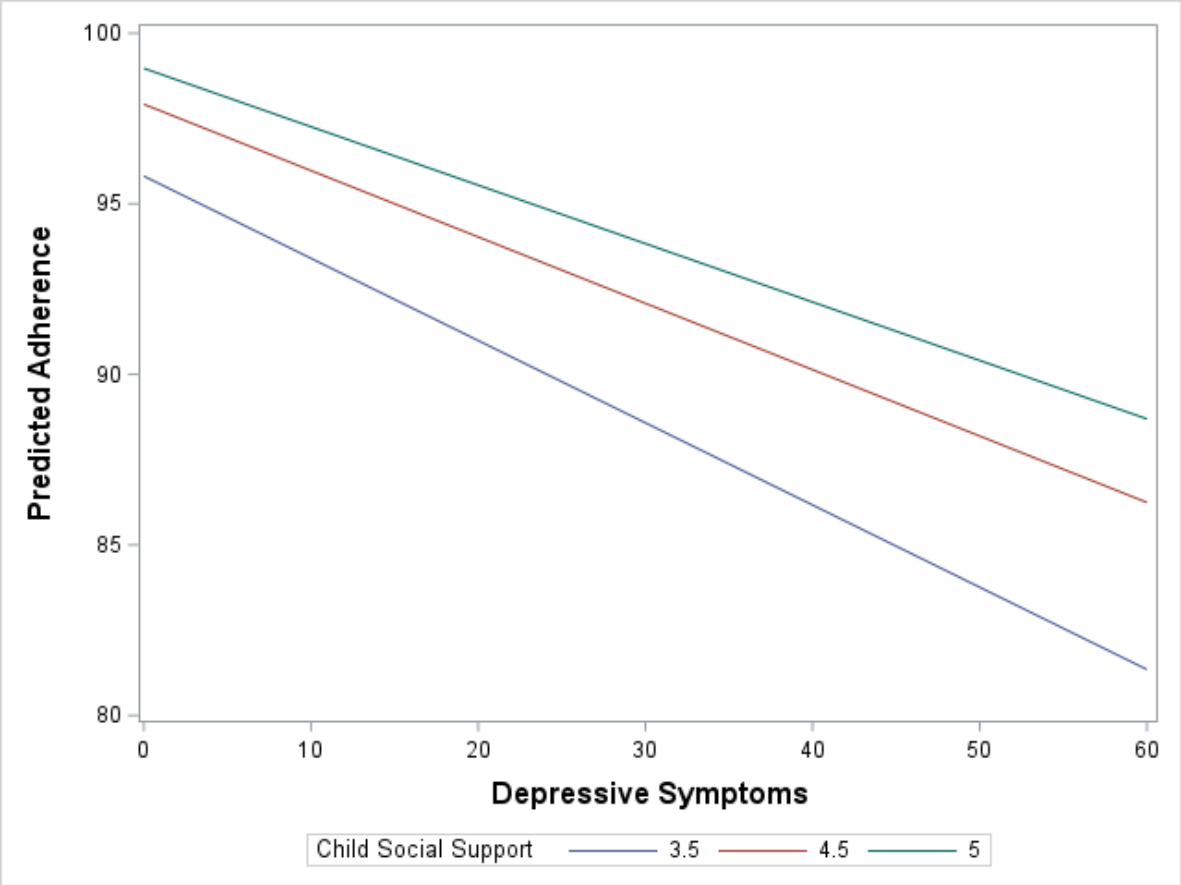

Figure 4. Interaction between Depression and Child Strain

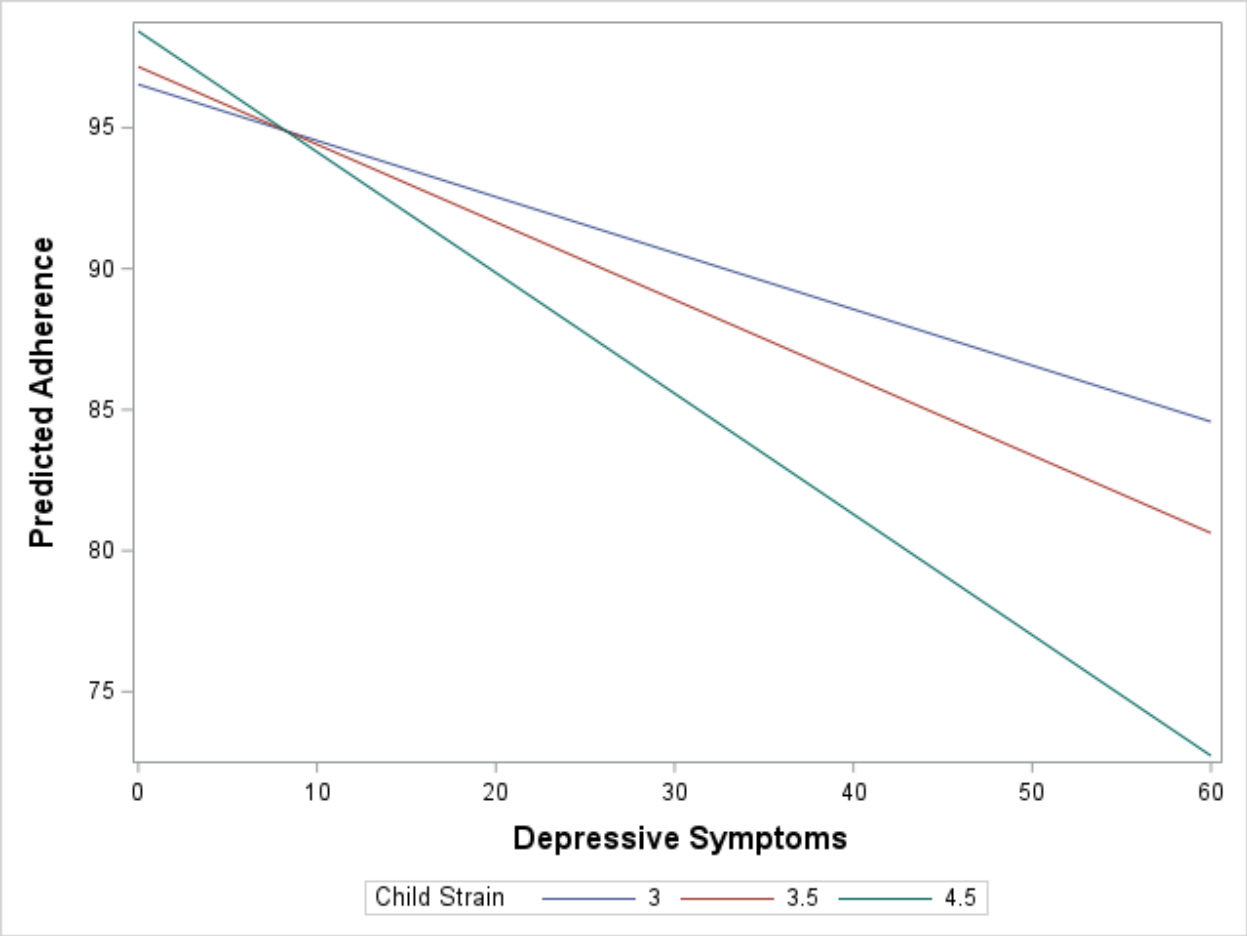

Figure 5. Interaction between Stress and Relationship Equity

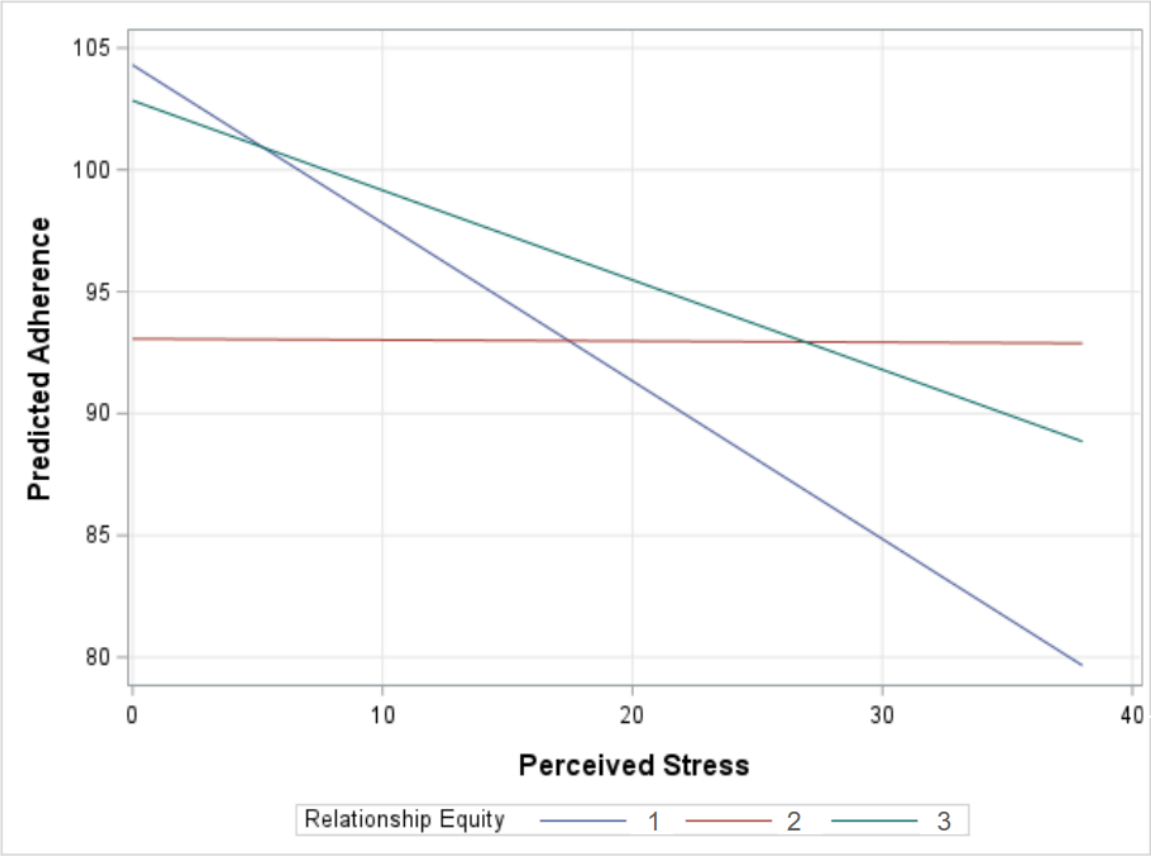

Figure 6. Interaction between Depression and Relationship Equity