

Original Research

Mental Health and Quality of Life in Kenyan Youths: Differential Susceptibility to Family RiskDorcas N. Magai¹, Hans M. Koot^{2,*}

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* **Correspondence:** Hans M. Koot; E-Mail: j.m.koot@vu.nl**Academic Editor:** Nicole Mahrer**Special Issue:** [The Impact of Biopsychosocial Factors on the Mental Health of Diverse Children and Adolescents](#)*OBM Integrative and Complementary Medicine*
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doi:10.21926/obm.icm.2404068**Received:** May 29, 2024**Accepted:** November 21, 2024**Published:** November 29, 2024**Abstract**

This cross-sectional study addressed the association between parental and family characteristics as risk factors for emotional and behavioral problems (EBP) and quality of life (QoL) and the potential moderation of these associations by adolescents' characteristics. A total of 533 households from Central Kenya with adolescents between 12 to 18 years (median age 15 years) and their mothers (or female caregivers) were included in this study. Adolescents and their mothers completed questionnaires on parent and family risk, adolescent EBPs and QoL, and adolescent personal characteristics. Regression analyses were used to test associations between parent/family factors and adolescent EBP and QoL. In contrast, using Hayes' PROCESS model, conditional process modeling was used to test for moderation effects. We found that poor maternal mental health and parental control were associated with both EBP and QoL. The adolescent's level of connectedness at school and home moderated the relationship between poor maternal mental health and adolescent EBP ($p = 0.015$). Additionally, adolescents who did not participate in meaningful physical activities



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and whose mothers had high depression levels had the lowest QoL ($p = 0.002$). Lastly, the associations of parental control with increased EBP ($\beta = 0.06, p = 0.000$) and lowered QoL ($\beta = -0.05, p = 0.000$) were not moderated by adolescent personal characteristics. Mental health professionals and other stakeholders should focus on interventions that target these malleable factors to enhance good mental health and better QoL for Kenyan adolescents.

Keywords

Mental health; quality of life; adolescent; family risk; protective child factors

1. Introduction

1.1 Adolescent Mental Health and Quality of Life

Adolescents' poor mental health is a significant concern to parents, mental health practitioners, and policymakers. Globally, an estimated 11.6% of children and adolescents are affected by mental health disorders [1]. Adolescents' emotional and behavioral problems (EBP) manifest themselves in symptoms of anxiety, depression, attention problems, and oppositional and aggressive behavior [2] and may be registered by both self- and proxy reports [3]. Compared to children and adolescents from other parts of the world, parents of children and adolescents in sub-Saharan Africa (SSA) and Middle Eastern countries report the highest levels of EBP for their children [4-6]. These elevated EBP in adolescents in SSA may potentially hamper their overall development and negatively impact their quality of life (QoL) [7].

Kenyan adolescents and youth constitute nearly half the country's population [8]. Although efforts have been made to harness the potential of this demographic, Kenya's adolescents still face significant challenges, with mental health being one of the major concerns. For instance, Kenyan adolescents and youth experience EBP almost twice when compared to their peers in similar multicultural settings [5]. Reports [5] indicated increasing numbers of street children every year, high unemployment rates and high incarceration rates in youths between 15 and 24 years, and riots and burning of schools in Kenya. Several factors, including poverty, insecure neighborhoods, poor organization of learning institutions, and adverse life events, have been associated with increased mental health problems. Factors such as stigma, limited mental health resources, economic challenges, early pregnancies, insecurity, adverse life events, and other socio-determinants may further exacerbate these mental health challenges.

Despite the evidence of the increased prevalence of EBP in children and adolescents in Kenya and its societal factors, much less information is available regarding the individual and family factors related to EBP and the QoL of adolescents in this part of the world. Given the communal and interconnectedness culture of Kenyan families and communities, the family environment may play a crucial role either as a protective or risk factor in adolescents' mental health. Although the importance of family environment in shaping adolescents' mental health is widely acknowledged, data is lacking in the Kenyan context. Yet, such information is needed to optimize adolescents' well-being. Additionally, since in Kenya, caring responsibilities are mainly seen as roles for female caregivers [9], it is crucial to understand how maternal factors influence adolescents' mental health.

Researchers have identified family factors, including maternal psychopathology and parental control, to be associated with increased EBPs [10-20] and lowered quality of life [21-25]. Mothers with depressive symptoms may be irritable and use harsh parenting psychological practices, hindering healthy parenting involvement and parent-child interaction. [12, 24] which may affect the child's socio-emotional well-being and general functioning. Conversely, good maternal mental health may protect adolescents from adverse mental health outcomes by fostering secure attachment and bonding, helping adolescents to establish a safety net with their mothers. Additionally, a study conducted in Kenya has shown that adolescents in this context lack autonomy and are micromanaged by adults [26]. Studies in high-income countries have found that when parents exert high psychological control, adolescents display increased internalizing and externalizing behavior problems [27-31]. However, less is known about this relation in sub-Saharan Africa, highlighting a need for further research in this region.

Similarly, various adolescent factors have been linked to adolescent EBP and poor quality of life. To begin with, children's physical health has been associated with general poor mental health due to both direct and indirect effects of the possible family stress situations it may create. Although there has been a significant reduction in the burden of infectious disease, there is a high prevalence of physical illness in Kenya. For instance, in 2023, 59% of new HIV infections were recorded among adolescents aged 10-19 years [32]. Additionally, there is an expected increase in non-communicable diseases among adolescents in Kenya [33, 34]. Children with physical illnesses, especially chronic ones, may be at a greater risk of distress and EBPs [35-37]. Adolescents' physical health may also impact their overall QoL [38-42]. However, there is limited evidence about the relationship between physical illness and adolescent EBP in Kenya. It is therefore essential to evaluate this association because when adolescents maintain good physical health, they are better positioned to engage positively with their environment, are better positioned to manage stress, and they may develop resilience against EBPs.

Also, children's environment is an essential aspect of their general well-being. Environmental safety - a perceived state of being out of danger or injury - at school and in the child's neighborhood plays a vital role in their mental well-being. Despite apparent safety established by the Kenyan government [43], both private and public schools in Kenya still face various challenges, such as school fires, sexual and physical abuse, bullying, and other factors that threaten the safety of Kenyan adolescents in schools. At the same time, many Kenyan adolescents encounter unsafe conditions at home, often due to maltreatment, domestic violence, and extreme poverty. However, research on the association between environmental safety and EBPs and QoL within the Kenyan context is limited. Studies from higher resource settings have indicated that positive school experiences and perceived safety in the neighborhood are associated with fewer mental health problems [44-48]. It is, therefore, imperative to examine the relationship between environmental safety and mental health among Kenyan adolescents. Insights from this study could help identify modifiable factors to enhance adolescent mental well-being because adolescents who feel safe may likely thrive academically and socially.

Moreover, studies have examined the relationship between parent-child connectedness - a sense of closeness and being loved and cared for by a parent- and school connectedness - a feeling that adults and peers in the school environment care about individuals and their learning [45, 49-54]. These studies have found that low school connectedness predicted EBP, including depressive and anxiety symptoms and conduct problems [54]. In contrast, high levels of measures of

connectedness were associated with increased life satisfaction and fewer mental health problems [49]. Adolescent connectedness with family has been associated with positive affect, better academic outcomes, and a greater sense of optimism. This connectedness may provide a secure foundation to seek out and build healthy relationships with other people around them. Moreover, feeling connected to school may enhance a sense of identity, improve academic achievement, and increase self-esteem, which may buffer adolescents from increased EBPs. Therefore, understanding this relationship, particularly in the Kenyan context where close family bonds and a strong sense of connectedness hold deep cultural significance, is essential for uncovering the mechanisms that drive these associations. Such insights can guide strategies to optimize adolescent mental health.

It is well established that physical activities have a significant impact on the overall functioning of individuals. The effect of physical activities on mental health, especially in preventing and managing mild to moderate mental health problems, including anxiety and depression, is also well-established [55-58]. However, little is known about this relationship in the Kenyan context. Physical exercise among Kenyan youth is limited due to constraints such as lack of facilities, limited community programs that encourage regular exercise, and prioritization of academics over physical activity. Increased access to and participation in physical activities could provide valuable protective factors against poor mental health among Kenyan adolescents, fostering resilience and reducing the risk of EBPs.

While higher levels of elevated EBPs may be linked to poor outcomes and reduced quality of life in adolescents, these links may differ across adolescents with different personal characteristics. According to the differential susceptibility theory, some children are more vulnerable to adverse developmental and supportive environments than average children [59]. This theory is supported by evidence that children's emotional and behavioral characteristics moderate the experience of environmental influences. Thus, individuals differ in their susceptibility to environmental influences. In contrast, some children are likely to be relatively much affected by exposure to environmental risk or protection, others may be less affected or not affected at all. Research has unveiled that sensitive children may suffer more in adverse environments but prosper more in supportive environments [60-62]. For instance, children with internalizing behaviors are likely to benefit from supportive parenting environments, and social support predicts attachment security but only in highly irritable children [60].

The differential susceptibility is further demonstrated by the moderation of individual children's characteristics of the influence of both positive and negative aspects of the environment [63]. Although studies on the moderating effects of individual child factors on the association between parental characteristics and child EBPs and QoL are limited, these adolescent factors may likely buffer or exacerbate the impact of parent factors on EBP. For example, of adolescents whose mothers experience mental health problems, those who are physically inactive may express higher EBP than those who engage in physical activities. This is because exercise may produce an improved mood, increased self-control, self-confidence, and enhanced ability to handle negative experiences in the home. Thus, these adolescents can better self-regulate their emotions and behaviors, which mitigates the likelihood of EBP.

Although some initial work conducted in low and middle-income countries (LMICs) has highlighted factors associated with emotional and behavioral problems [11, 45, 64], these studies do not highlight individual differential susceptibility and only capture information obtained from

single respondents. Additionally, research on the factors associated with adolescents' quality of life is still lacking.

The current study used the notion of differential susceptibility to understand adolescent characteristics as potential moderators of parental influences on adolescent EBP and QoL in Kenya using self and parent reports. Understanding the possible moderating role of adolescents' individual characteristics on the association between parental risk factors and adolescents' EBP is very important, specifically in Kenya, as children and adolescents in this country are among those with the highest levels of internalizing problems worldwide, according to both parent and adolescent report [4, 6]. Therefore, information on these is needed to adequately address adolescent mental health issues in this part of the world.

Therefore, in this study, we aimed to understand the association between parent factors and EBP and QoL in Kenyan adolescents aged 12 to 18 and the potential moderating effect of adolescent personal characteristics on this association. We hypothesized that (1) maternal psychopathology and parental control would have a significant association with adolescent EBP and QoL and that (2) the strength of this association would be (partly) dependent on adolescent physical health, safety, connectedness, and physical activities [65]. See Figure 1.

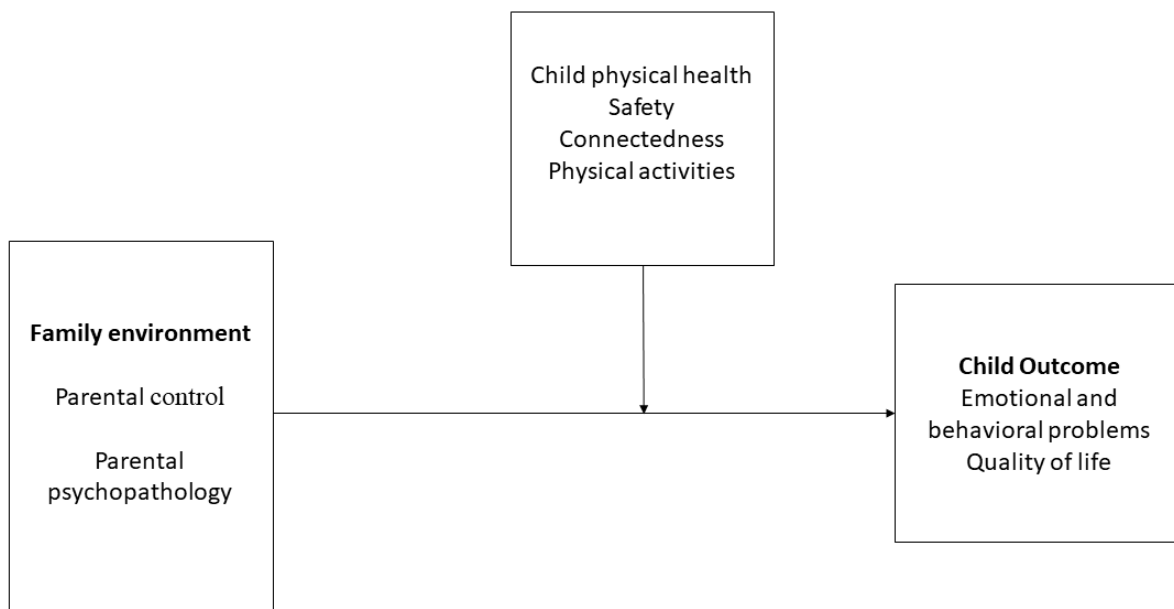


Figure 1 Hypothesized moderation model explaining the relationship between parental control, family functioning, maternal psychopathology, and EBP moderated by child physical health, safety, connectedness, and physical activities.

2. Method

2.1 Participants

This study is part of more extensive research conducted in 2016 in the Central Province of Kenya (Nyeri and Kiambu Counties) to determine the prevalence of EBPs and QoL in a stratified random sample of 1022 households with children and adolescents equally distributed across gender and the

13 age groups (ages 6 through 18 for parent information; ages 12 through 18 for adolescents). Therefore, children and adolescents were included in this study if they were between 6 years to 18 years old. For a full sampling and recruitment procedure description, see Magai et al. (2018) [5]. This study used only data from the 533 adolescents between 12 to 18 years (median age 15 years) and their mothers or female caregivers (henceforward called mothers). The demographic characteristics of the participants in this sample are presented in Table 1.

Table 1 Participants Socio-demographic Characteristics.

| | Child | Mother |
|---------------------------|------------|-------------|
| Age (years; median [IQR]) | 15 [13-16] | 39 [35-45] |
| Sex n (%) | | |
| Male | 263 (49.3) | 0 (0.0) |
| Female | 269 (50.5) | 533 (100.0) |
| Occupation n (%) | - | |
| None | - | 16 (3.0) |
| Housewife | - | 275 (51.6) |
| Self-employed | - | 139 (26.1) |
| Employed | - | 40 (7.5) |
| Other | - | 57(10.7) |
| No response | - | 6 (1.1) |
| Level of education n (%) | - | |
| None | - | 22 (4.1) |
| Primary school | - | 305 (57.2) |
| Secondary school | - | 169 (31.7) |
| Vocational training | - | 9 (1.7) |
| College | - | 14 (2.6) |
| University | - | 7 (1.3) |
| Other | - | 1 (0.2) |
| No response | - | 5(0.9) |
| Marital status n (%) | - | |
| Yes | - | 367 (68.9) |
| No | - | 129 (24.2) |
| No response | - | 37 (6.9) |

2.2 Measures

2.2.1 Parent Factors

Maternal Psychopathology. The Beck Depression Inventory-II (BDI-II) [66] was used to assess maternal psychopathology, precisely depressive symptoms, in the past two weeks. The BDI-II is a 21-item self-report measure with possible scores ranging from 0 to 63. The participant responds to questions ranging from 0 to 3, depending on how well the statement describes their situation. Item scores are summed with higher scores indicating higher levels of depression. This scale has well-established psychometric properties in psychiatric and non-psychiatric samples [67].

Parental Control. Adolescents' perception of parental control was assessed using the eight psychological control items on each parent adapted from the Psychological Control Scale - Youth Self-Report (PCS-YSR) [68]. Items were scored on a 3-point scale: 1 = Not like her (him); 2 = Somewhat like her (him); 3 = A lot like her (him). For example, "My mother (father) is always trying to change how I feel or think about things." Higher scores indicate higher levels of perceived parental control. This scale has been reported to have good reliability and validity (Cronbach's alpha = 0.89) [69].

2.2.2 Child Outcomes

Adolescent Mental Health Symptoms: Child Behavior Checklist (CBCL) and Youth Self Report (YSR). The Child Behavior Checklist (CBCL) is a standardized parental report about their children's EBPs [70] with good psychometric properties, also in the Kenyan population [5]. The CBCL has 113 items, and its problem scale items are scored as 0 (not true), 1 (somewhat or sometimes true), and 2 (very accurate or often true). Eight main syndrome scales (Anxious/depressed, Withdrawn/Depressed, Somatic complaints, Social problems, Thought problems, Attention problems, Rule-breaking behavior, and Aggressive behavior) and three main broad-band scales (Internalizing, Externalizing, and Total Problems) are used to categorize EBPs in children and adolescents. Anxious/depressed, Withdrawn/depressed, and Somatic complaints subscale scores are summed into the Internalizing scale score, while Rule-breaking behavior and Aggressive behavior subscale scores are summed into Externalizing scores, and all individual problem items into the Total Problems score, with higher scale scores indicating higher levels of EBP.

The Youth Self Report (YSR) is administered to adolescents aged 12-18 and has 112 items. It is a self-report about the youth's EBPs and has a response format and scale structure similar to the CBCL, except that 14 problem items are replaced by socially desirable items [70]. The tool has excellent internal consistency [5, 71]. This study used the average combined Z-scores for both the parent and adolescent-reported EBP.

Quality of Life: Pediatric Quality of Life (PedsQL) Inventory. The Pediatric Quality of Life Inventory (PedsQL) is a subjective measure of an individual's health-related QoL [72]. The tool has 15 items that assess the individual's physical health, emotional, social, and school functioning. The PedsQL items are reverse scored on a 5-point scale (100 for never to 0 for almost always), and higher scores indicate better QoL. In this study, both maternal reports and youth self-reports were obtained. The PedsQL has excellent internal consistency for adolescents' and mothers' reports [73]. Acceptable internal consistencies are reported in the Kenyan population (Cronbach's alphas 0.6-0.9 for adolescents and 0.6-0.8 for parents) [7]. This study used the average combined Z-scores for both the parent and child-reported QoL.

2.2.3 Candidate Moderator Variables

Physical Health. Adolescent physical health was assessed by asking the parents, 'How would you rate your child's health in general?' This item was scored on a 5-point scale, ranging from 'excellent' to 'poor'. The scale was reverse-scored, with higher scores indicating better health. We developed this one-item question to capture the child's physical health.

Safety. Two questions assessed adolescent-perceived safety at school and home, asking “Do you ever feel unsafe at school?” and “Do you ever feel unsafe at home?” respectively. The items were scored on a 5-point scale: “not at all”, “little”, “somewhat”, “quite a bit”, and “very much”. The items were reverse-scored, with higher scores indicating a higher perception of safety. We developed this two-item question to capture the adolescents’ feelings of safety at school and home.

Family and School Connectedness. Two items were used to assess adolescent-rated family connectedness. The items inquired how much the adolescents could freely talk to their mothers about their problems and to what extent they felt their mothers cared for them. School connectedness was captured by two items that assessed how close the youth was to their school and the extent to which they felt that they were part of the school. The responses were scored on a 5-point scale ranging from “not at all” to “very much,” with higher scores indicating increased connectedness to family and school. The items are reported to have good internal consistency [74, 75]. We adapted this questionnaire from the original questionnaire used in a previous study by Loukas and colleagues [75].

Physical Activities. Adolescents were asked if they engaged in any physical activities, including not only playing sports but also activities such as gathering wood, herding, or helping parents on the farms. This item was coded 0 “No” and 1 “Yes.” We developed this one-item question to capture the adolescents’ engagement in physical activities.

2.3 Ethics Statement

The scientific and ethical review committee of the Faculty of Behavioral and Movement Sciences of Vrije Universiteit Amsterdam approved the research proposal. Further approval was received from the National Commission for Science, Technology and Innovation (NACOSTI) in Kenya, which also approved the study's ethical standards and issued the needed research permit. Approval for data collection was also obtained from the Kiambu and Nyeri county commissioners, county education officers, and district commissioners. All study participants were fully briefed about the study and provided written informed consent.

2.4 Statistical Analysis

We conducted a univariate regression analysis to assess the association between parent factors and adolescent mental health and QoL outcomes, followed by conditional process modeling to test for moderation effects in SPSS version 23 using Hayes’ PROCESS macro model 7 [76]. Factors that yielded an association with the p -value level ≤ 0.25 were entered into the moderation analysis to explore the moderation effects of adolescent characteristics on the association between parent factors on adolescents' EBPS and QoL [77]. The moderation effect of each moderator variable (e.g., adolescent physical health) was tested separately while controlling for the impact of adolescent gender and age.

A detailed description of the participants, sample size, power, precision, recruitment, data collection, quality of measurement, and ethics approval is provided elsewhere [5, 7]. All measures used in this study have also been reported, and we followed the Journal Article Reporting Standards

(JARS). The materials and analysis code for this study are available by emailing the corresponding author. This study design and its analysis were not pre-registered.

3. Results

The results of the univariate regression analysis are presented in Table 2. Maternal psychopathology, parental control, adolescents' physical health, safety, and connectedness were significantly associated with EBP. All these factors were also significantly associated with adolescents' QoL. Other demographic variables, including parental occupation, level of education, and marital status, did not have any association with the adolescent's EBPs and QoL.

Table 2 Results of Univariate Regression Analysis of Adolescent Emotional and Behavioral Problems (EBP) and Quality of Life (QoL) on Parent and Adolescent Factors.

| Parent and Adolescent Factors | EPB | | | QoL | | |
|-------------------------------|---------|-------|-------|---------|-------|-------|
| | β | t | p | β | t | p |
| Maternal Psychopathology | 0.27 | 6.33 | 0.000 | -0.31 | -7.50 | 0.000 |
| Parental Control | 0.27 | 6.51 | 0.000 | -0.27 | -6.42 | 0.000 |
| Physical health | -0.09 | -2.06 | 0.040 | 0.11 | 2.47 | 0.014 |
| Safety | 0.17 | 3.94 | 0.000 | -0.29 | -6.91 | 0.000 |
| Connectedness | -0.15 | -3.51 | 0.000 | 0.13 | 0.13 | 0.003 |
| Physical activities | 0.02 | 0.47 | 0.641 | 0.08 | 1.95 | 0.051 |

Note: EBP - Emotional and behavioral problems; QoL - Quality of life.

3.1 Parent Factors and Adolescent EBP

A significant amount of variance in adolescents' EBP was accounted for by maternal psychopathology and adolescents' health [$F(5, 518) = 10.74, p < 0.001, R^2 = 0.09$], safety [$F(5, 518) = 11.69, p < 0.001, R^2 = 0.10$], and connectedness [$F(5, 520) = 12.99, p < 0.001, R^2 = 0.11$] as indicated in Table 3. Also, a significant amount of variance in adolescents' EBP was accounted for by parental control and adolescent health [$F(5, 513) = 10.51, p < 0.001, R^2 = 0.09$], safety [$F(5, 518) = 11.20, p < 0.001, R^2 = 0.10$], and connectedness [$F(5, 520) = 11.52, p < 0.001, R^2 = 0.10$]. Higher levels of maternal psychopathology and higher levels of parental control were associated with increased EBPs.

Table 3 Main and Moderated Effects of Parent Factors on Adolescent Emotional and Behavioral Problems (EBP) and Quality of Life (QoL).

| Factors | EPB | | | QoL | | |
|--------------------------|---------|-------|-------|---------|-------|-------|
| | β | t | p | β | t | p |
| Moderators | | | | | | |
| Maternal Psychopathology | 0.02 | 5.00 | 0.000 | -0.02 | -7.23 | 0.000 |
| Physical health | 0.01 | 1.88 | 0.061 | -0.00 | -0.77 | 0.443 |
| Safety | -0.00 | -0.79 | 0.432 | 0.00 | -0.83 | 0.400 |
| Connectedness | -0.00 | -2.44 | 0.015 | 0.00 | -0.86 | 0.389 |
| Activities | - | - | - | 0.03 | 3.17 | 0.002 |
| Parental Control | 0.06 | 6.34 | 0.000 | -0.05 | -5.62 | 0.000 |
| Health | 0.01 | 1.31 | 0.191 | 0.01 | 1.37 | 0.170 |
| Safety | -0.01 | -1.53 | 0.126 | 0.00 | 0.35 | 0.720 |
| Connectedness | -0.00 | -0.81 | 0.419 | 0.00 | 1.19 | 0.233 |
| Activities | - | - | - | -0.02 | -0.80 | 0.424 |

Note: EBP- Emotional and behavioral problems; QoL-Quality of life.

3.2 Family Factors and EBP as Moderated by Adolescent Factors

The main effect of maternal psychopathology on adolescents’ EBPs was moderated by levels of connectedness [$F(1,520) = 5.96, p = 0.015, R^2 = 0.01$]. An examination of the interaction plot shows that adolescents whose mothers had feeble mental health and low connectedness had the highest levels of EBP (Figure 2). However, the effect of poor maternal psychopathology decreased considerably for those who reported higher levels of connectedness. Adolescents’ health [$F(1, 513) = 1.71, p = 0.191, R^2 = 0.00$], safety [$F(1, 518) = 2.34, p = 0.126, R^2 = 0.00$], and connectedness [$F(1, 520) = 0.65, p = 0.419, R^2 = 0.00$] did not moderate the relationship between maternal psychopathology and adolescents’ EBP (Table 3).

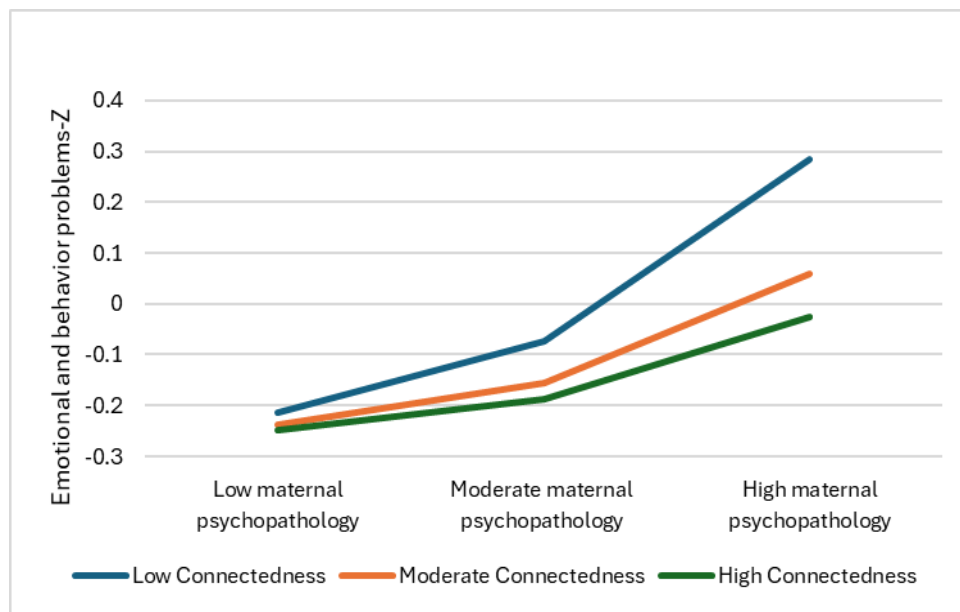


Figure 2 Interaction Between Maternal Psychopathology and Connectedness on Emotional and Behavior Problems.

3.3 Parent Factors and Adolescents' QoL

A significant amount of variance in QoL was accounted for by maternal psychopathology and adolescents' health [$F(5, 518) = 16.35, p < 0.001, R^2 = 0.14$], physical activities [$F(5, 526) = 19.16, p < 0.001, R^2 = 0.15$], safety [$F(5, 518) = 18.25, p < 0.001, R^2 = 0.15$], and connectedness [$F(5, 892) = 33.88, p < 0.001, R^2 = 0.16$]. Elevated maternal psychopathology was associated with lowered QoL ($\beta = -0.02, p = 0.000$). Similarly, a significant amount of variance in adolescents' QoL was accounted for by parental control and adolescents' health [$F(5, 513) = 12.53, p < 0.001, R^2 = 0.11$], physical activities [$F(5, 521) = 12.75, p < 0.001, R^2 = 0.11$], safety [$F(5, 518) = 18.25, p < 0.001, R^2 = 0.15$], and connectedness [$F(5, 520) = 13.24, p < 0.001, R^2 = 0.11$]. High parental control was associated with lowered QoL ($\beta = -0.05, p = 0.000$).

3.4 Parent Factors and QoL as Moderated by Adolescent Factors

The main effect of maternal psychopathology on QoL was moderated by the levels of adolescent physical activities [$F(1, 526) = 10.07, p = 0.002, R^2 = 0.02$]. Adolescents who did not participate in any meaningful physical activities and whose mothers had high levels of psychopathology had the lowest QoL (Figure 3), while a protective effect of physical activities was also visible at a moderate level of maternal psychopathology but not at the lowest level. By contrast, there was no significant interaction effect between parental control and adolescents' health [$F(1, 513) = 1.89, p = 0.170, R^2 = 0.00$], physical activities [$F(1, 521) = 0.64, p = 0.420, R^2 = 0.00$], safety [$F(1, 518) = 0.13, p = 0.723, R^2 = 0.00$], and connectedness [$F(5, 520) = 1.42, p < 0.233, R^2 = 0.00$] on adolescents' QoL (Table 3).

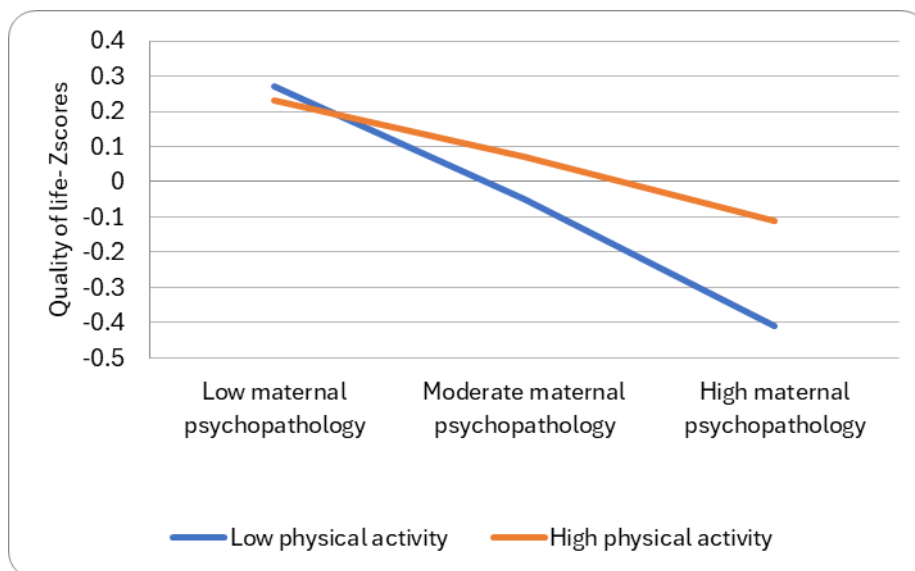


Figure 3 Interaction Between Maternal Psychopathology and Physical Activities on Quality of Life.

4. Discussion

This study examined parental and adolescents' personal correlates of adolescents' mental health problems and QoL in a general population sample in Kenya. First, we found that both poor maternal mental health and higher parental control were associated with increased EBP and lowered QoL. As

hypothesized, this study also found some evidence for factors protecting against the influence of these two factors. Levels of connectedness moderated the association between maternal mental health and adolescents' EBP in that high connectedness seemed to protect against the effects of poor maternal mental health. We also found that adolescents who did not participate in any meaningful physical activities and whose mothers had high levels of psychopathology had the lowest QoL. Lastly, none of the child factors moderated the association between parental control and adolescents' QoL.

4.1 Parent Factors and Adolescents' Emotional and Behavioral Problems

Our finding that poor maternal mental health was associated with increased EBP in adolescents corroborates various existing research [10-16]. The results of the current study corroborate the findings by Goodman and colleagues, who reported that maternal psychopathology is significantly associated with increased internalizing and externalizing problems in adolescents [78]. Our study adds to the literature on the association between maternal psychopathology and adolescents' EBP in LMICs. Our findings also confirm the potential value in early screening, identification, and treatment of maternal and child psychopathology in LMICs. The early detection and management of psychopathology are essential as the offspring of depressed mothers have an increased risk of other mental health problems starting in preschool and continuing throughout adolescence and adulthood with comorbid substance abuse and other problem behaviors.

Our study also found that increased parental control was associated with increased adolescent EBP. Further, this relationship was not moderated by any adolescent factors, including physical health, safety, and connectedness. The result of this study supports the findings of del Barco and colleagues, who found that Spanish adolescents who perceived their parents to be controlling were six times more likely to develop internalizing behavior problems and five times more likely to create externalizing problems [18]. Other studies have reported that parental control was linked to adolescent psychopathology through emotional regulation [17-22, 27]. Possible explanations for the effects of parental control on child psychopathology could be that parental control denies the child the ability to be autonomous; thus, they may feel psychologically dependent on their parents. Moreover, children whose parents are highly controlling are likely to feel shame and guilt due to the constant invalidation of their thoughts by their parents [27, 68, 79, 80]. Additionally, children and adolescents with controlling parents are less likely to form healthy social relations and develop low emotional functioning [27].

4.2 Parent Factors and Adolescents' Quality of Life

In support of existing literature [22-24], we found that elevated maternal psychopathology was associated with lowered QoL. Mothers with poor mental health are more likely to use harsh parenting practices [12]. Mothers with depressive symptoms may be irritable and lack the energy to be involved in daily parenting responsibilities and parent-child interaction [24]. Thus, adolescents are likely to have poor socio-emotional and cognitive functioning, affecting their overall well-being.

Also, high parental control was associated with lowered QoL. This finding is similar to the results by Stafford and colleagues (2016) and Srivastav and Mathur (2020), who reported that high parental control could lead to a child developing lowered self-regulation, poor social skills, and difficulties in academic productivity due to the intrusiveness of parents [81], which may affect their quality of life.

4.3 Parent Factors and Emotional and Behavior Problems as Moderated by Adolescent Factors

Poor maternal mental health was associated with adolescents' EBP, and adolescents' level of connectedness moderated this association. Our results indicate that children of depressed mothers (as measured with the BDI) who have poor connectedness at home and/or school have the highest levels of EBPs. Connectedness is an essential factor in a child's mental health and well-being. It indicates the extent to which the individual feels accepted, supported, close to, and cared for by the people they interact with daily at home or school [82]. Other studies have also reported that home and school connectedness relate strongly to children's mental health problems and overall functioning [82-85]. The positive influence of connectedness on EBPs may be that children who are connected at school and/or home may feel that their psychosocial needs are met. Therefore, they internalize the prosocial family and school values, norms, and expectations, which help them avoid deviant peers and experience higher life satisfaction [75]. Therefore, although their mothers may be depressed, children who have high levels of connectedness either at home or in school are likely to have a sense of belonging and being wanted; thus, individuals may feel safe to express themselves and interact with peers and teachers at school and their other family members at home despite their mother's poor mental health.

4.4 Parent Factors and Quality of Life as Moderated by Adolescent Factors

Adolescents who did not participate in any meaningful physical activities and whose mothers had high depression levels had the lowest QoL. It has been proposed that the mechanism through which physical activity affects mental health lies in the fact that exercising may produce an improved mood, increased self-control, self-confidence, and enhanced ability to handle events that challenge one's mental health [86]. Thus, children who participate in meaningful physical activities are likely to cope better despite their mother's mental health problems. Our findings corroborate the results of the study by Kantomaa and colleagues, who found that physical activity was associated with children's mental health outcomes [87]. Children who participate in physical exercises may have an excellent way to channel feelings. These children will likely engage in teamwork, self-direction, discipline, and tolerance. Therefore, the benefits of physical exercise may buffer the effects of their mothers' poor mental health. It is also possible that parental distress negatively impacts the children's engagement in physical activity.

Our study found that none of the child factors (physical health, physical activity, connectedness, and safety) moderated the effect of parental control on adolescent's QoL. At the same time, only adolescent's connectedness moderated the impact of parental control on EBPs. Studies have shown that parents who tend to use high control are more likely to engage in harmful or harsh parenting styles [12], potentially leading to emotional dysregulation in their children. Moreover, harsh parenting is associated with lower child physical health and lowered feelings of connectedness and safety. Finally, we know that (over)active children elicit more control attempts in parents than their quiet counterparts do. Therefore, it could be that the effects of parental control supersede the potential protective effects of physical health, physical activity, connectedness, and safety.

Our study findings may have important implications for signaling, detection, counseling, referral, treatment, and public mental health policy regarding emotional and behavioral problems in Kenyan children and adolescents and their quality of life. Already 10 years ago, the Kenya Mental Health Bill 2014 was drafted, followed by the Kenya Mental Health Action Plan (2021-2025), aiming to bring

Kenya's mental health services to a par with international standards. However, as indicated earlier, youth mental health services in this country are suffering from a shortage of research-based knowledge. Our findings highlight the importance of family connectedness and adolescent safety at home and school in influencing increased EBPs and lowered QoL. In the Kenyan context, where the family structure is often intergenerational and communal, adolescents may rely heavily on support as the primary source of resilience. Strengthening family bonds and reducing parental control can lead to better mental health outcomes in children and adolescents. Moreover, addressing critical challenges experienced in school environments and promoting feelings of school safety through targeted interventions may improve the mental well-being of Kenya's adolescents.

4.5 Study Limitations and Implications

This is one of the first studies that addressed the associations of a broad range of adolescent and family factors with EBP and QoL in a large population sample of Kenyan adolescents. However, some limitations should be considered when interpreting the findings from this study. First, the study used a correlational design; therefore, we cannot infer temporal and causal relationships. For instance, the causal relationship between maternal mental health and adolescents' EBP and QoL is unclear. Future studies should employ a longitudinal and possibly genetically sensitive design to explain this relationship.

Additionally, it could be that depressed mothers were more likely to report poor mental health and QoL in their children than non-depressed mothers did [88]. Secondly, we did not have fathers as informants about their children's mental health. Some studies indicate that paternal involvement and good paternal mental health may buffer the negative impact of poor maternal mental health on the children's well-being. However, in most SSA countries, child care and parenting are mainly a responsibility left to the maternal caregivers; therefore, the positive effect of paternal mental health may be less noticeable. Future studies should investigate this relationship.

Lastly, parameters are self-rated and may have introduced social desirability bias. Moreover, aspects such as physical health, physical activity, and safety were not assessed by a validated tool or independent rater and, therefore, subject to information bias. Given the limited validated tools in SSA to capture adolescents' physical health, physical activities, and safety, we used one or two questions that may not have holistically captured these constructs. Future studies should consider developing or adapting culturally appropriate tools for physical health, physical activities, and safety in this population.

Despite these limitations, this study provides valuable insights into malleable risk factors for EBPs in Kenyan youth. Identifying these factors forms an important basis for preventing and reducing EBPs in the Kenyan population.

5. Conclusion

Understanding the malleable factors that affect these adolescents' mental health and QoL is a critical task for different stakeholders who ensure that adolescents are healthy and fully utilize their potential. This study was set to investigate the association between family factors and adolescent EBP and QoL and how several adolescent factors moderate this relationship. The study found that poor maternal mental health was associated with increased EBP and lowered QoL, and these relationships were moderated by levels of adolescents' connectedness and physical activities,

respectively. Higher parental control was associated with increased EBPs and decreased QoL; none of the adolescent factors moderated these relationships. In contrast, family functioning was not associated with EBP and QoL. Mental health professionals and other stakeholders should focus on interventions that target these malleable factors to ensure good mental health and QoL of Kenyan children and adolescents.

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Author Contributions

DNM and HMK both were equally responsible for the conception and design of the study, and together drafted and revised the manuscript. DNM was responsible for data acquisition and analysis, supervised by HMK, while HMK was responsible for funding of the study.

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Competing Interests

We have no conflict of interest to disclose.

Data Availability Statement

Materials and analysis codes for this study are available by emailing the corresponding author.

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