AMERICAN UNIVERSITY OF BEIRUT

EXAMINING THE PATHWAYS BETWEEN PARENT AND ADOLESCENT MENTAL HEALTH THROUGH FAMILY FUNCTIONING AND PARENTING PRACTICES IN VULNERABLE POPULATIONS: A CROSS-SECTIONAL STUDY

by
MONICA LISA ANTOINE BARBARI

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MONICA LISA ANTOINE BARBARI

Approved by:

Dr. Tania Bosqui, Associate Professor Department of Psychology	Advisor
Dr. Mona Ayoub, Assistant Professor Department of Psychology	Member of Committee
Dr. Kristin Hadfield, Associate Professor School of Psychology Trinity College Dublin Ireland	Member of Committee

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To my beautiful and tormented country Lebanon, I hope your children one day find peace and can flourish and blossom like the spring flowers that continue to bloom on your land, against so many odds.

ABSTRACT
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Conflict-affected children are at greater risk of emotional and behavioral difficulties. A socioecological perspective emphasizes examining their mental health within the family systems in which they are embedded. Lebanon, marked by recurrent conflict and hosting large refugee populations, provides a relevant context for examining associations between family systemic factors and parent and child mental health.

The current study examined the association between parent and adolescent mental health in conflict-affected populations and how this relationship is linked to key family systemic processes, including parenting practices and overall family functioning. The study utilized baseline secondary data from a multi-site randomized controlled trial (RCT) in Lebanon of a family intervention (Sawa Aqwa–Stronger Together), with 345 Lebanese, Syrian, and Palestinian adolescents aged 12–17 and their parents.

Findings indicated that maternal mental health significantly predicted adolescent mental health, including internalizing and externalizing symptoms, while paternal mental health was not associated with overall adolescent mental health but was a strong predictor of internalizing symptoms. Exposure to adverse and potentially traumatic events also emerged as robust predictors. Family functioning was a consistent predictor of adolescent mental health, whereas parenting practices were not. Mediation analysis indicated that both family functioning and parenting practices mediated the association between maternal and adolescent mental health.

These findings highlight the central role of family functioning, parenting practices, and parent mental health in shaping adolescent mental health in conflict-affected populations, with implications for family-based prevention and intervention strategies.

Keywords: Adolescents, conflict affected-populations, family functioning, parenting practices, mental-health

TABLE OF CONTENTS

ACKNOWLEDGEMENTS 1

ABSTRACT 2

ILLUSTRATIONS 6

TABLES 7

BACKGROUND 8

A. Child and Adolescent Mental Health in the Lebanese Context 9

B. The Association Between Parent and Child Mental Health 10

C. The Relationship Between Adolescent and Parent Mental Health and Family Systemic Factors in Contexts of Adversity 13

CURRENT STUDY 20

A. Study Hypotheses 26

METHODOLOGY 28

A. Procedure 28

B. Sample 29

C. Outcome Measures 31

1. Adolescent Reported Outcomes 32
2. Parent Reported Outcomes 33
3. Parent and Adolescent Reported Outcomes 34
4. Demographic Information 35

D. Ethics 35

E. Data Analysis Plan 35

1. Preliminary Data Screening 36
2. Assumptions Testing 37
3. Regression Analysis (Hypotheses 1 & 2) 37
4. Correlation Analysis (Hypothesis 3) 39
5. Mediation Analyses (Hypothesis 4) 40

RESULTS 42

A. Preliminary Data Screening 42

B. Descriptive Statistics 43

C. Correlation Results 47

D. Assumption Testing 51

1. Mother-adolescent Sample 51
2. Father-adolescent Sample 52

E. Regression Analysis 53

1. Mother-Adolescent Sample 53
2. Father-Adolescent Sample 58

F. Mediation Analysis 69

1. Parenting Practices as Mediator of Association Between Maternal and Adolescent Mental Health 69
2. Family Functioning as Mediator of Association Between Maternal and Adolescent Mental Health 69

DISCUSSION 71

LIMITATIONS, STRENGTHS, AND FUTURE DIRECTIONS 82

APPENDIX A.....90

APPENDIX B.....91

APPENDIX C.....92

APPENDIX D.....93

APPENDIX E.....94

APPENDIX F.....95

REFERENCES.....98

ILLUSTRATIONS

Figure

1. Mediation Model Diagram with Parenting Practices as Mediator..... 26

2. Mediation Model Diagram with Family Functioning as Mediator..... 27

TABLES

Tables

1. Sample Characteristics 44
2. Descriptive Statistics Displaying Mean Score and Standard Deviation from the Mean for Each Variable 44
3. Overview of Measures, Scoring, and Interpretation 46
4. Correlation Matrix of Main Study Variables 50
5. Summary of Hierarchical Regression Models Examining Maternal Mental Health as Predictor of Adolescent Mental Health 63
6. Summary of Hierarchical Regression Models Examining Maternal Mental Health as Predictor of Adolescent Mental Health Subscales 64
7. Summary of Hierarchical Regression Models Examining Maternal Parenting Practices and Family Functioning as Predictors of Adolescent Mental Health Over and Above Maternal Mental Health 65
8. Summary of Hierarchical Regression Models Examining Paternal Mental Health as Predictor of Adolescent Mental Health 66
9. Summary of Hierarchical Regression Models Examining Paternal Mental Health as Predictor of Adolescent Mental Health Subscales 67
10. Summary of Hierarchical Regression Models Examining Paternal Parenting Practices and Family Functioning as Predictors of Adolescent Mental Health Over and Above Paternal Mental Health 68
11. The Systemic Clinical Outcome and Routine Evaluation Index (SCORE; Stratton et al., 2014) 90
12. Brief Parenting Questionnaire (BPQ; Miller et al., 2025) 91
13. The Kessler Psychological Distress Scale (K6; Kessler et al., 2002) 92
14. The Pediatric Symptom Checklist 35 adolescent report (PSC-35; Jellinek et al., 1999) 93
15. The Pediatric Symptom Checklist 17 Youth Report (PSC-17; Murphy et al., 2016) 94
16. Adverse Events Measure (Bosqui et al, In Press) 95

CHAPTER I

BACKGROUND

It is an alarming reality that more children than ever before are residing in conflict-affected areas or are being forcibly displaced due to violence (UNICEF, 2024a). In 2023, 1.9 billion children lived in conflict affected countries, with 473 million children living in a conflict zone (more than 1 in 6 children worldwide) (PRIO, 2024). Exposure to armed conflict and political violence is linked to higher levels of psychopathology in children (Michalek et al., 2022) and fundamentally affects children's safety, well-being and development (Bosqui et al., 2017). Studies on prevalence rates of common mental health disorders amongst refugee children and adolescents consistently find high rates of PTSD, depression and anxiety disorders (Blackmore et al., 2020; McEwen et al., 2023; Scherer et al., 2020).

While the pervasive stressors faced by children exposed to conflict and forced displacement have been clearly identified, including interruption of education, poverty and unmet basic needs, loss of social support, and heightened risk of exploitation and child labor (Hazer & Gredebäck, 2023; McEwen et al., 2024), less is known about the relational mechanisms that are associated with their mental health difficulties. When considering the broader ecological system surrounding conflict-affected children, it becomes important to recognize that conflict-affected populations at large are at greater risk of experiencing varying degrees of negative mental health outcomes (Bunn et al., 2022; Tol et al., 2013), with prevalence of common mental health disorders estimated at 22.1% among conflict-affected groups globally (Charlson et al., 2019). An ecological perspective therefore emphasizes the importance of examining conflict-affected children's mental health within the context of the family systems in which they are

embedded, moving beyond a narrow focus on the role of direct war-related exposure and adversity in their psychological adjustment.

A. Child and Adolescent Mental Health in the Lebanese Context

Adverse social and environmental conditions such as poverty and violence place children and youth at heightened risk for mental health difficulties (Pedersen et al., 2019). Lebanon, a country marked by recurrent conflict, socio-political and economic adversity and the coexistence of multiple conflict-affected populations, provides a context of particular relevance to examine the association between family systemic factors and child mental health. Lebanon has been in a chronic state of conflict since its independence in 1943 (El-Khoury, 2019). Persistent conflict and instability in recent history was primarily marked by a long and bloody civil war ending in 1990, a 33-day war with Israel in 2006, and the spillover of the Syrian civil war from 2011 onwards. The volatile security situation in the country was compounded by the COVID-19 pandemic and economic collapse in 2019, followed by the Beirut Port Explosion in 2020. Since 2023, active conflict between Israel and Lebanon has been ongoing. Lebanon's physical, political and social infrastructure has virtually collapsed under the pressures of all these disasters. Lebanon continues to be the country hosting the largest number of refugees per capita per square kilometer (UNHCR, 2025), with an estimated population of 1.5 million Syrian refugees in a country with a total population of 5.85 million. Lebanon also hosts an estimated 222,000 Palestinian refugees (UNRWA, 2025).

The psychological toll of residing in such a context has had a major impact on all populations in the country, with particular concern for the mental health of children. In a unique epidemiological study investigating the psychiatric status of youth in Beirut, Lebanon's capital, 26.1% of participants received a diagnosis from a psychiatrist and psychologist of at least one psychiatric disorder amounting to 1 in four adolescents in the study (Maalouf et al., 2016). Furthermore, refugee children residing in Lebanon may be amongst the most vulnerable groups to mental health distress and negative developmental outcomes. A study on a large cohort of Syrian refugee children residing in informal tented settlements in Lebanon found a prevalence rate of 57.5% of common mental health disorders including PTSD, conduct disorder and oppositional defiant disorder, major depressive disorder and anxiety disorders, with high rates of comorbidity (McEwen et al., 2023). A qualitative study conducted by UNICEF (2024b) found that Palestinian refugee children in Lebanon are at heightened risk of emotional distress due to chronic exposure to harassment, bullying, violence, interrupted education, poor socio-economic conditions, and general safety concerns. A meaningful understanding of contributing factors to this vulnerability in child mental health in such settings must inevitably account for the mental health of parents, whose psychological status is foundational to children's developmental, emotional and psychological adjustment.

B. The Association Between Parent and Child Mental Health

The association between caregiver and child mental health is now difficult to dispute, supported by substantial research documenting this relationship in conflict-

affected populations (Bernhardt et al., 2024; East et al., 2018; McEwen et al., 2023; Popham et al., 2024; Sim et al., 2018). For example, in a study on a sample of Syrian refugee children and their families residing in tented-settlements in Lebanon, an association was found between caregiver depression, anxiety and impulsivity and child oppositional defiant disorder, conduct disorder and depression, while caregiver PTSD was associated with all child mental health outcomes although to a lesser extent (McEwen et al., 2023). Similar findings were obtained in a sample of Syrian refugees residing in Jordan, where Michalek et al. (2024) found that maternal symptoms of anxiety and depression were significantly associated with higher levels of children's internalizing, externalizing and attention-related symptoms. It is worth noting that in this study mothers reported on children's mental health rather than child self-report, and therefore the potential exists for maternal psychological distress to have partially shaped their perceptions of their children's symptoms (Michalek et al., 2024).

The association between parent and child mental health holds true within other populations and contexts. For example, in a study on Somali refugee mothers and their children in the United States, extent of past traumatic event exposure of mothers was associated with maternal depressive symptoms, which was in turn significantly linked to children's more frequent depressive symptoms, and these children were more likely to experience bullying victimizations and higher levels of perceived racism in their communities (East et al., 2018).

Furthermore, in a systematic review examining social-emotional and cognitive outcomes in children directly exposed to forced displacement due to political violence, maternal distress was found to strongly influence children's adaptation and socialization and play behavior in the host country (Bernhardt et al., 2024). In their analysis, the

authors consider that post-migration stressors and exposure to structural inequalities likely hamper the capacity of caregivers to provide their children with an adequate sense of security and stability.

The experience of chronic structural inequality and daily stressors puts parents and children alike at risk of adverse mental health trajectories. Parents and their children co-experience the same adverse structural conditions which likely undermine parents' capacity to cope and, in turn, influence children's mental health, while it is likely also that their mental health challenges mutually influence one another. It is important to note that most studies on the associations between child and caregiver mental health do not include fathers or include a minute proportion, which may limit the relevance of findings to associations between child and parent mental health more generally. Nevertheless, overall, these findings highlight the need to move beyond individual-level mental health to the relational processes that may operate as the mechanisms through which parent and child mental health are associated in contexts of exposure to chronic adversity.

It is important to acknowledge that shared genetic vulnerability and gene-environment interaction significantly contribute to the transmission of psychopathology across generations (Marceau et al., 2022). Evidence clearly implicates the role of direct genetic transmission of psychopathology across generations (Jami et al., 2021), as well as through gene-environment interaction (Assary et al., 2020; Jami et al., 2021). Relevant to the present study, recent evidence also points to the role of phenotypic transmission processes, whereby psychopathology is passed on through observable behaviors and relational patterns within the family system, against a genetic backdrop (Marceau et al., 2022). Family systemic processes such as parenting practices and

overall family functioning represent important behavioral pathways, which in themselves may be influenced by genetics, through which parent mental health translates onto the broader family environment and contributes to shaping child psychological adjustment in contexts of exposure to chronic adversity. Therefore, an examination of relational processes that shape the quality of children's immediate psychosocial environment is fundamental in achieving a more holistic understanding of the factors contributing to children's psychological adjustment, while recognizing that direct genetic influences and gene-environment interactions are fundemental processes in the intergenerational transmission of psychopathology.

C. The Relationship Between Adolescent and Parent Mental Health and Family Systemic Factors in Contexts of Adversity

The role of a supportive and positive family environment in promoting child development and wellbeing is now broadly acknowledged (Jordans et al., 2018), highlighting the importance of adopting an ecological approach to understanding the relationship between exposure to conflict and mental health outcomes (Alkrenawi &Graham, 2012). To unpack how these broader ecological conditions interact with child adjustment from a family systemic perspective, it is essential to examine the role of core constructs that capture relational processes within the family.

Specific constructs of interest in achieving a systemic understanding of the association between caregiver mental health and child adjustment include family functioning and parenting practices. Family functioning refers to the overall quality of relational, emotional, and communication processes within the family system. As a

singular construct, it reflects how families manage difficulties, support each other, communicate effectively, as well as maintain closeness and adaptive patterns of interaction (as conceptualized in the family functioning construct measured in this study, see Carr & Stratton, 2017; Stratton et al., 2010; Stratton et al., 2014). Parenting practices can be conceptualized as an influential aspect of relational processes contributing to family functioning and particularly reflects the degree of harsh parenting practices present in comparison to parental responsiveness and warmth (see Miller et al., 2025).

These constructs have been implicated in a range of studies examining the association between relational family processes and parent and adolescent mental health in conflict-affected populations. For example, a systematic review of parenting and mental health in protracted refugee situations found that across studies, the protracted refugee situations and daily stressors involved contributed to parental depression and anxiety, which in turn predicted harsh parenting styles (Khraisha et al., 2025). Other studies demonstrate that harsher parenting practices and less warmth and behavioral control were associated with child maladjustment problems (Eltanamly et al., 2021). These findings, taken together, elucidate the potential of overall family functioning and parenting practices to function as pathways linking parent and child mental health. Few studies however have examined the full process, exploring how parent mental health may be linked to child mental health through family systemic mechanisms.

Evidence from studies examining associations between family relational processes and child mental health suggest that family functioning and parenting practices may act as consistent mechanisms that significantly contribute to child mental health functioning. For example, perceived family support and cohesive, effective

parenting have been shown to be associated with lower levels of internalizing and externalizing symptoms in migrant and refugee children, functioning as protective factors in buffering the negative psychological consequences of exposure to violence (Huynh & Li, 2025). Similarly, evidence from other meta-analysis demonstrates that parental exposure to war was associated with less parental warmth and increased harsh parenting, which subsequently partially mediates the impact of war exposure onto children's adjustment difficulties, including post-traumatic stress, depression, anxiety, social issues, and externalizing behaviors (Eltanamly et al., 2021). Cross-cultural findings further substantiate the universality of these pathways, demonstrating that parental indifference and neglect consistently predict children's maladjustment across diverse sociocultural settings with little variation by parental gender or cultural background (Khaleque, 2015). Together, these findings demonstrate that family relational processes are not simple correlates of child mental health but potentially represent a key mechanism through which the consequences of environmental and structural adversities are transmitted, highlighting their centrality in understanding children's psychological adjustment.

Context specific findings from Lebanon further reinforce the role of family mechanisms in child psychological adjustment. In a study conducted in Lebanon with Syrian refugees, child-maltreatment and child-parent conflict were linked to child mental health disorders (McEwen et al., 2023). Findings on the psychological adjustment of Lebanese children also demonstrate that caregiving quality functions as a key pathway linking environmental adversity to child mental health, highlighting the consistency of this pattern across all populations in Lebanon. For example, Fayyad et al. (2017) found that family relation stressors and family violence were significantly

associated with higher internalizing and externalizing problems as well as higher levels of PTSD in a sample of war-exposed Lebanese adolescents. The risk of higher externalizing and internalizing problems was fourfold for children who did not spend enough time with caregivers and did not receive enough help with their schoolwork at home. Broader indicators of family disruption, such as parent separation, divorce or loss have also been linked to a threefold increase in likelihood of child psychopathology in a sample of Lebanese adolescents residing in the capital Beirut (Maalouf et al., 2016), which has been disproportionately impacted by the multiple conflicts and crises faced by the country. These studies collectively substantiate the relevance of examining family relational factors in uncovering key processes through which environmental and structural adversity become consequential on child psychological adjustment in the Lebanese context.

Fewer studies directly examine the role that family functioning and parenting practices play on mediating the relationship between parent and child mental health. Findings from a study on Syrian refugee families in Lebanon demonstrated that maternal psychological distress was linked to increased harsh punishment and rejecting parenting, which in turn mediated its impact on children's psychosocial difficulties (Sim et al., 2018). Similarly, another study on a sample of Syrian refugee families in Lebanon residing in informal tented settlements found that the quality of parenting mediated the association between maternal and child mental health (Popham et al., 2024). Specifically, worse maternal mental health was associated with more negative parenting, which in turn was associated with higher levels of child PTSD and depression. This association held over a cross-sectional examination of the data over two time points in the same sample. It is also important to note that at the same time,

direct associations were identified between maternal mental health and child externalizing problems and depression, while controlling for parenting quality. Interestingly, the study found that the refugee environment (social and physical) did not have a direct effect on child mental health but was associated to child outcomes only through maternal mental health. Such findings add nuance to understanding the associations between parent and child mental health in contexts of adversity, implicating the interaction between the wider environmental context and familial dynamics in influencing parent and child psychological adjustment. Taken together, these studies provide conceptual justification for an exploratory examination of the mediational role of family functioning and parenting practices in the association between parent and child mental health, in the aim of elaborating key pathways through which the consequences of adversity may be transmitted trans-generationally.

Findings from systematic reviews demonstrating that interventions aimed at strengthening family relationships and enhancing caregiver capacities in war-affected populations and in low- and middle-income countries effectively improve child and adolescent mental health (Bosqui et al., 2024; Bosqui & Marshoud, 2018; Bunn et al., 2022; Pedersen et al., 2019), underscore the central role of family functioning in shaping child adjustment. Similarly, studies on conflict-affected populations in low- and middle-income countries show that interventions focused on improving caregiver mental health and family functioning effectively enhance aspects of child and adolescent mental health (Bryant et al., 2022). Such findings further support the theoretical basis linking caregiver mental health and quality of family functioning to child and adolescent psychological adjustment. However, other family-based interventions have shown mixed results, with improvements in family functioning and

caregiver mental health but not in adolescent distress (Bosqui et al, In press; Brown et al., 2024b), highlighting the need to further examine the mechanisms linking caregiver mental health, family functioning, and parenting practices to child psychological adjustment.

While such intervention research provides evidence of directionality in the impact of caregiver mental health and family systemic processes onto child adjustment, it is important to acknowledge that this relationship is likely bidirectional. For example, evidence demonstrates that parenting behavior is likely mutually influenced by both child and parent characteristics alike (Ayoub et al., 2019). Nevertheless, the current study examines the contributions of parent mental health and family systemic factors to child adjustment, given its primary focus is adolescent mental health, without assuming causality or unidirectionality of relationships.

The current study's main overall contribution is its focus on the association between parent distress and adolescent mental health in a conflict-affected population while considering multiple relational constructs and broader socioecological risk factors simultaneously. In particular, the study contributes to a growing shift away from exclusively trauma-focused investigations of psychopathology in conflict-affected populations, and recognizes the role of chronic adversity and post-displacement stressors in shaping parents' and children's broader psychological adjustment in line with Miller and Rassmussen's (2017) ecological model of distress in conflict-affected populations. The current study also recognizes that these ecological conditions operate alongside and interact with family systemic processes, and contribute to shaping adolescent adjustment. Furthermore, by focusing specifically on adolescence as a critical developmental period and examining paternal mental health alongside maternal

mental health, the study addresses several under-researched areas. Finally, a novel contribution of this study is the examination of family functioning as a possible mediator of the association between maternal and adolescent mental health in a conflict affected population, along with parenting practices. Other mediation studies have primarily considered the role of parenting behaviors in this association (e.g. Popham et al., 2024; Sim et al., 2019).

CHAPTER II

CURRENT STUDY

The current study utilized baseline secondary data originally obtained in a multi-site effectiveness-implementation randomized controlled trial (RCT) in Lebanon of a newly developed family intervention (Sawa Aqwa-Stronger Together) (Bosqui et al., In press).

The current study firstly aimed to explore the associations between parent mental health, parenting practices, family functioning, and adolescent mental health in conflict-affected populations residing in Lebanon. An exploratory additional aim was to examine whether family functioning and parenting practices function as pathways mediating the association between maternal and child mental health. The present study's aims were guided by a combined socioecological (Broefenbrenner, 1996) and family systems theory framework, and are consistent with the ecological model of distress in conflict-affected populations which emphasizes that patterns of mental health in such contexts must be exmined while considering the impact of the chronic social and material conditions in which individuals and families reside (Miller & Rasmussen, 2010). By integrating a systemic family perspective within a socioecological model, the current research aimed to highlight how parent mental health and family systemic processes operate as mechanisms through which broader contextual adversities partially translate onto child psychological adjustment.

From a systems theory viewpoint, universally children and adolescents function as integral parts of their family unit and are therefore shaped by its positive and negative influences, which contribute to both adaptive and maladaptive behaviors. However, these dynamics may be particularly pronounced in collectivistic cultures, where the

family plays a central organizing role in children's lives (Basu et al., 2020). Furthermore, considering the broader ecological and chronic adversities faced by families particularly in conflict-settings, the whole family system can be undermined, compromising the quality of parenting, and impacting mental health outcomes in both children and caregivers (Bunn et al., 2022). More specifically, it is thought that parents' exposure to chronic adversity influences their mental health and subsequent caregiving capacity, ultimately impacting child adjustment (Miller et al., 2020). Parenting behaviors in war-affected settings may represent both the pathway through which exposure to conflict affects children and the capacity of the family system to buffer or amplify these impacts (Murphy et al., 2017).

Guided by the present study's theoretical framework and the reviewed literature suggesting that caregiver and parent mental health is associated with family functioning and parenting practices, which are in turn linked to child adjustment, the exploratory use of mediation analysis is conceptually justified despite the cross-sectional nature of the data. The directionality specified in the mediation model is informed by ecological and family systems theory as well as reviewed evidence from intervention research. Consistent with prior cross-sectional research in conflict-affected populations (e.g. Sims et al., 2018; Popham et al., 2024), mediation analyses are used to examine indirect associations rather than to test causal pathways. Findings will be interpreted with caution, recognizing that the mediation model cannot establish directionality of associations or causality, nor capture the full complexity of the dynamics at play between the key study variables, with due consideration that the examined associations are likely bi-directional.

Within Syrian refugee families in particular, there remains limited evidence on how patterns of family functioning, while considering the role of parenting practices, interact to influence child mental health, highlighting the need for further research in this population (Hazer & Gredebäck, 2023). The same holds true for Lebanese and Palestinian families residing in Lebanon, who are exposed to chronic adversity and conflict.

The scale of psychological distress in conflict-affected children and adolescents places significant stakes on human developmental globally. Accordingly, the development and implementation of effective services to prevent distress and support mental well-being among conflict-affected children is essential (Brown et al., 2017). Yet an understanding of the factors that curtail child and adolescent mental health is a crucial prerequisite to any efforts aimed at preserving and promoting it. Evidence from psychosocial support interventions targeting forcibly displaced children and adolescents strongly points to the need to attend to broader family, community and systemic factors in improving their mental health outcomes (Pluess et al., 2025). Because positive caregiving serves as a particularly important protective mechanism in conflict-affected settings where other traditional protective influences such as schools, communities and public services typically accessible are disrupted and where risk of exposure to traumatic events by children is heightened (Murphy et al., 2017), a better understanding of the role of caregiving quality and overall family dynamics in child psychological adjustment can elucidate pathways that can be strengthened to improve child mental health.

While a robust relationship between caregiver/parent and child mental health in conflict settings has been established, with hypothesized mechanisms for this

relationship pointing at parenting quality playing a mediating role from studies in non-war settings (Sim et al., 2018), few studies on conflict-affected populations have empirically examined the mediation role of parenting practices and overall family functioning. Even fewer studies focus on the period of adolescence in particular to examine these relationships. The mental health trajectory during adolescence is particularly critical in that it likely exerts a lasting influence on psychological functioning and well-being in adulthood (Bosqui et al., In press). The fact that 50% of individuals with any mental health disorder experience onset before age 18, with peak age of onset being 14.5 years (Solmi et al., 2022) underscores the importance of adolescence as a pivotal developmental stage for early detection and intervention (Maalouf et al., 2016). Therefore, it is critical to examine the ecological dynamics influencing adolescent mental health outcomes in particular in the aim of informing youth mental health prevention and interventions strategies.

To more accurately identify the unique contribution of parent mental health to adolescent mental health and the role of family relational processes (i.e. family functioning and parenting practices) in this association, key sociodemographic variables (ie. Gender, age, and household level socioeconomic status) as well as number of adverse events experienced are treated as control variables in the present research.

Socioeconomic status has been shown to have a confounding effect on parent and youth mental health as well as on parenting behaviors. For example, financial hardship has been linked to caregiver mental health difficulties and subsequent lower quality parenting practices and family functioning in conflict-affected populations (McEwen et al., 2023), as well as to youth mental health symptoms in contexts of chronic adversity such as Lebanon (Scheuring & Bosqui, 2025). Furthermore, in

another study conducted in Lebanon, parental warmth was positively associated with parent's socioeconomic status (Ayoub & Bachir, 2025). Meta-analysis further substantiates the association between socioeconomic status and parenting practices, showing that higher socioeconomic status is associated with greater parental warmth, positive parenting, and behavioral control, and with lower levels of harsh or psychologically controlling parenting, although these associations are generally small in magnitude (Ayoub & Bashir, 2023). Interestingly, other findings suggest that lower socio-economic status may in some cases be linked to reduced prevalence of anxiety and depression symptoms in conflict-affected populations (Chen et al., 2025). Because household SES can shape both parent and child mental health in multiple directions as well as parenting practices, controlling for its influences can facilitate clearer interpretation of the contribution of primary study variables to results.

Adolescent gender has also been treated as a control variable in this study. Child gender likely has a confounding effect on child mental health. For example, Hoffman et al. (2023) found that in a sample of resettled Karen refugees, certain family functioning patterns were more strongly associated with poorer mental health for boys than for girls, and parental torture exposure was more strongly linked to poorer youth adjustment in boys than in girls. Considering the likely confounding effect of child gender on child mental health, it will be controlled for.

Age similarly warrants inclusion as a control variable. Child age has been found to play a role in the association between war exposure and child psychological adjustment. Chen et al. (2025) found that the impact of war on mental health was more pronounced in older children than in younger children, who demonstrated increased vulnerability to anxiety. Parent age may also play a role in the quality of parenting

practices in conflict-affected populations. For example, in a study on Syrian refugee families residing in Turkey, younger mothers were more likely to use harsh disciplining methods such as spanking with their children (Peltonen et al., 2023). By controlling for age, the unique contribution of parent mental health and family system processes to adolescent mental health can be better isolated.

Furthermore, number of adverse and potentially traumatic events experienced by adolescents (i.e. including exposure to war events and chronic stressors) are included as a control variable. Exposure to macro-level chronic stressors has been linked to psychopathology in parents, with subsequent impact on parenting practices in conflict-affected populations (Khraisha et al., 2025), while *extent of repeated exposure* to adverse childhood events has been linked to higher levels of psychological maladjustment in children (Bernhardt et al., 2024). Furthermore, research demonstrates that the specific *nature* of war exposure, not merely its presence, shapes parenting practices and child adjustment (Eltanamly et al., 2021). Therefore, in order to ensure that the association between caregiver and adolescent mental health and the contributing effects of family relational variables to this association reflect relational processes rather than differences in levels or types of trauma exposure or chronic stress across families, number of adverse and potentially traumatic events experienced have been treated as control variables.

A. Study Hypotheses

H1) Parent mental health will positively predict adolescent mental health, after controlling for key confounders.

H2) Parenting practices and family functioning will positively predict adolescent mental health, after controlling for key confounders.

H2A) These relationships will remain after controlling for parent mental health.

H3) Adolescent-reported family functioning will be positively associated with parent-reported family functioning.

H4) Family functioning and parenting practices will each mediate the relationship between maternal mental health and adolescent mental health.

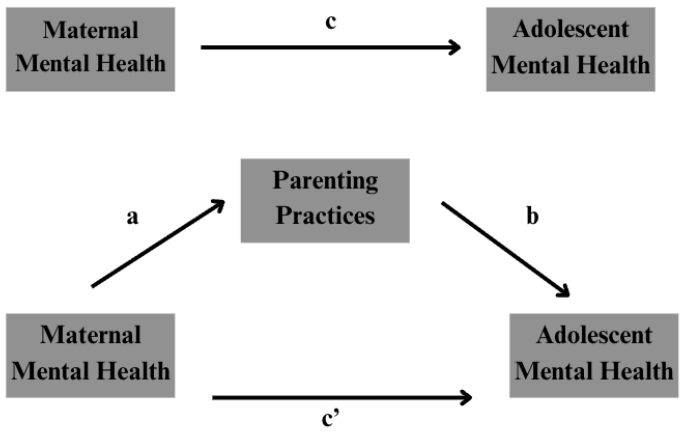

Figure 1 Mediation Model Diagram with Parenting Practices as Mediator

Diagram of expected mediation effects of parenting practices on the association between maternal mental health and adolescent mental health

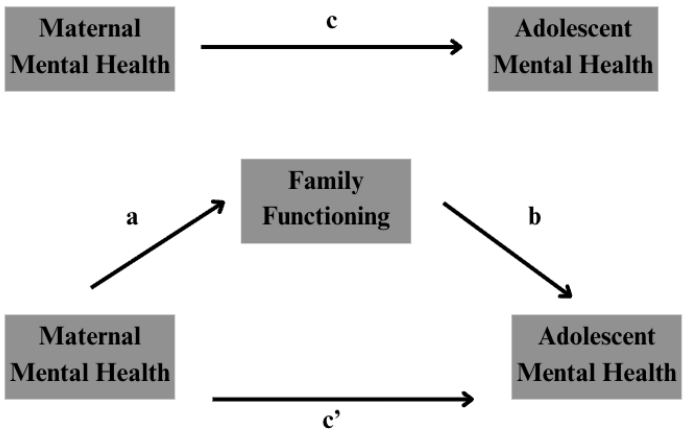

Figure 2 Mediation Model Diagram with Family Functioning as Mediator

Diagram of expected mediation effects of family functioning on the association between maternal mental health and adolescent mental health

CHAPTER III

METHODOLOGY

The current cross-sectional study utilizes baseline secondary data originally obtained in a multi-site effectiveness-implementation randomized controlled trial (RCT) in Lebanon of a newly developed family intervention (Sawa Aqwa-Stronger Together). The intervention is aimed at improving adolescent and caregiver mental health outcomes and family functioning (Bosqui et al., In press). For the current study, baseline secondary data was used for a cross-sectional analysis of the association between parent and adolescent mental health, and the role of family functioning and parenting practices in contributing to it.

A. Procedure

The data was initially collected in three sites in two governorates of Lebanon by three implementing partners who were involved in the intervention implementation, with War Child and Danish Refugee Council operating in primarily urban areas in North Lebanon and Terres Des Hommes Italy operating in agricultural regions and informal tented settlements in Northern Bekaa. These organizations had child protection programming in place in these areas.

Recruitment took place through community outreach, referral from existing programs in the implementing organizations, or through other community-based organizations. Implementing partner teams were trained on a standard recruitment script to be used on first contact. After providing informed consent (caregivers) and assent (adolescents), interested families were contacted by the research team for over-

the-phone individual screening interviews with all adolescents between the ages 12 to 17 years in identified families and all available caregivers. Families who met study criteria then underwent full baseline assessment over the phone on several measures.

The screening interview and assessments were administered by trained research assistants who followed locally developed guidance on conducting remote interviews while ensuring privacy in overcrowded living spaces. Research assistants were also trained and engaged in practice sessions on sensitive interviewing, managing distress and risk management, research ethics, obtaining informed consent and assent, the study procedures and record keeping (using RedCap and KoBo), provision of compensation, risks for bias in collecting quantitative data, adverse events reporting procedures, and data management. The competency and consistency of assessors was consistently monitored through regular supervision by the study's Primary Investigator. Reimbursement per session for each family was 25,000 LBP (equivalent to 10 USD at the time) to cover phone data usage and time spent.

B. Sample

Inclusion criteria for the primary study required families to have an adolescent between the ages of 12 to 17 years who were assessed to be medium to high risk for child protection concerns (defined for this study as being 'vulnerable to a protection risk but not high with imminent risk') and had an above cut-off score for general psychological distress on the Pediatric Symptoms Checklist (PSC-17) (a score of 12 or above). Importantly, this inclusion criteria resulted in a sample of adolescents presenting with relatively elevated levels of psychological distress, making the sample

more comparable to a high-risk or clinical population rather than a general population sample.

The PSC-17 Arabic version has been validated with adolescents in Lebanon (Brown et al., 2024a). If a family had multiple adolescents screening positively on the PSC-17, the one with the highest score was selected as the 'index adolescent', undergoing all the study's assessments at three different timepoints, although all family members were invited to participate in the intervention. Families of any nationality could participate, of any family composition, so long as at least one adult guardian was present and could provide informed consent. Screened adolescents and those recruited for the full study provided informed assent. Individuals who had severe psychiatric disturbances requiring specialized mental health care, or families receiving case management services or in need of immediate child protection interventions to address imminent risk, or unaccompanied, separated or married minors were not included in the study.

At baseline, 351 index adolescents and 391 caregivers from Syrian (72%), Palestinian (0.9%), Lebanese (23.4%) and other nationalities (3.7%) were screened-in and assessed, with 82.47% of caregivers being mothers. For the original study, the sample size was determined based on a two-group comparison of the study's primary outcome at the post intervention time point assuming a 5% two-tail significance test, with 80% power. The calculation yielded the requirement of a sample of 270 participants, while outreach attempted to recruit a sample allowing for 30% attrition rate (requiring 351 participants total). For the current study, post-hoc power analysis assuming a 5% two-tailed significance level and 80% power estimated that data from

263 participants would be sufficient to detect a small effect size ($f^2 = .05$) particularly for regression analysis.

A separate post hoc-power analysis for mediation analyses was conducted using Monte Carlo power analysis for indirect effects web application (Schoemann et al., 2017). Specifically, parameter values were specified for a simple mediation model using the final sample size of 318 mothers (see Results section). The effect sizes for the indirect paths from the independent variable to the mediator and from the mediator to the dependent variable were set to 0.2 (a, and b). The direct effect of the independent variable on the dependent variable was set to $c' = 0.10$. All variables were standardized with variances fixed at 1. Previous cross-sectional research on a similar sample that utilized mediation analyses identified moderate associations between caregiver mental health, parenting, and child outcomes (e.g. Sim et al., 2018). Considering such findings, the parameter values selected here for the post-hoc analysis represent more conservative estimates of these observed relationships, corresponding to a relatively small indirect effect for mediation. In psychological research, effect sizes are often small in magnitude (Cohen, 1988) justifying the use of such estimates as a benchmark for parameter setting. The sample size appeared sufficient to detect small to medium effects, supporting the feasibility of conducting the exploratory mediation analyses.

C. Outcome Measures

The majority of the measures used in the primary study had been previously translated and used in Lebanon by the research team (Brown et al., 2019; Pluess et al., 2024). One measure relevant to the current study, the Systemic Clinical Outcome and

Routine Evaluation (SCORE) Index of Family Functioning (Stratton et al., 2014), had not been previously used with the study's sample profile and was therefore translated into non-formal Arabic (in a dialect understandable to Lebanese, Syrian and Palestinian Arabic speakers). The adaptation of the SCORE followed recommended procedures for cross-cultural research (van Ommeren et al., 1999) (see Brown et al., 2022 and Bosqui et al., In press for details on the translation process).

1. Adolescent Reported Outcomes

The Pediatric Symptom Checklist 35 adolescent report (PSC-35; Jellinek et al., 1999) was used to assess adolescent psychological distress. The PSC-35 assesses symptoms in the areas of externalizing, internalizing, somatic, social, academic and attention difficulties. Items are responded to in terms of frequency of experiencing each symptom, using a 3-point scale ranging from 0 (never) to 2 (often). Total scores are obtained by adding all items together, and range from 0 to 70, with higher scores indicating poorer mental health. Sample items include: "feels sad, unhappy" and "is irritable, angry". Separate scores can also be obtained on separate subscales for internalizing, externalizing, and attention-related symptoms. The Arabic translated adolescent report measure showed high internal consistency ($\sigma = .80$), convergent validity, test-retest reliability and concurrent validity in a clinical psychiatric assessment in Lebanon (Brown et al., 2024a). In the current sample, it demonstrated acceptable internal consistency (Cronbach's $\alpha = .71$) (Bosqui et al., In press).

The PSC-17 is a shorter version of the PSC-35. The PSC-17's items are fully contained within the PSC-35 and follow the same scoring logic. The PSC-17 can yield

total scores or scores for the three subscales consisting of 5 to 7 items for externalizing, internalizing and attention-related symptoms (Murphy et al., 2016). The PSC-17 adolescent report measure was also validated in Lebanon and showed similar psychometric properties to the PSC-35 (see Brown et al., 2024a).

2. Parent Reported Outcomes

The Kessler Psychological Distress Scale (K6; Kessler et al., 2002) was used to measure parent psychological distress. It is a six-item measure consisting of questions about mental health symptoms over the past week. Answers are provided on a scale of 1 (all of the time) to 5 (none of the time). Total scores are obtained by adding all items together, and range from 6 to 30, with lower scores indicating higher levels of psychological distress. Sample items include "About how often during the past 7 days did you feel nervous?". In the current sample, the K-6 demonstrated excellent internal consistency (Cronbach's $\alpha = .90$) (Bosqui et al., In press).

The War Child Brief Parenting Questionnaire (BPQ; Miller et al., 2025) was used to measure parenting skills. It is a 24-item measure that was developed in Lebanon as part of a parenting intervention trial (Miller et al., 2025) and asks parents to rate their parenting practices over the past week. Items measure parental warmth, harsh discipline, and positive parenting. Items are scored on a scale of 1 (rarely) to 3 (often). Items related to harsh parenting are reverse scored. Total scores are obtained by adding all items together and range from 24 to 72, with higher scores indicating healthier parenting practices. Sample items include: "I am interested to play or talk with my child", and reverse scored items include: "When I interact with my child, it is in a harsh

or angry way". In a study evaluating the psychometric properties of the BPQ in Lebanon, the measure demonstrated high internal consistency (σ = .86) (Miller et al., 2025). In the current sample, the BPQ demonstrated excellent internal consistency (Cronbach's α = .95) (Bosqui et al., In press).

A 36-item inventory was developed to measure exposure of adolescents to potentially traumatic events and daily adversity which was administered to caregivers only. The measure was based on a checklist used in a recent RCT in a similar population (Brown et al., 2019) and adapted to assess daily stressors. Items are scored as 0 ("no") and 1 ("yes") for occurrence at any point in the past. Sample items include: "Lived in a war zone" and "Suffering from inadequate food or water". Total scores are obtained by adding together the number of items answered as 'yes', and range from 0 to 36, with higher scores indicating higher exposure to potentially traumatic events and chronic adversity.

3. Parent and Adolescent Reported Outcomes

The Systemic Clinical Outcome and Routine Evaluation Index (SCORE; Stratton et al., 2014) was used to measure family functioning with both adolescents and parents, and assesses three dimensions: strengths and adaptability, overwhelmed by difficulties and disrupted communication. It is a 15-item measure consisting of statements which respondents need to rate in terms of to what extent each item describes their family in the past week from 1 (not at all) to 5 (very well). Some items are reverse scored. Sample items include: "in my family we talk to each other about the things that matter to us", and reverse scored items include: "it feels risky to disagree in

our family". Total scores are obtained by adding all items together, and range from 15 to 75, with lower score indicating higher family functioning. The SCORE-15 demonstrated good internal consistency in the current adolescent sample (Cronbach's α = .80) and excellent internal consistency in the current parent sample (Cronbach's α = .94). (Bosqui et al., In press).

4. Demographic Information

Participants' demographic data was collected including nationality, gender, age, and geographical area of residence. Caregivers were asked to report on household average monthly income in Lebanese pounds.

D. Ethics

The primary study received local ethical approval from the Institutional Review Board of the American University of Beirut (Protocol ID: SBS-2021-0102). The current study using the primary study's de-identified secondary data also received local ethical approval from the Institutional Review Board of the American University of Beirut (Protocol ID: SBS-2025- 0388).

E. Data Analysis Plan

All analysis was conducted using R software version 4.5.3. Separate analyses were conducted to examine the associations between maternal variables and adolescent mental health and paternal variables and adolescent mental health. Data from non-

parent caregivers identified as legal guardians were excluded from the sample in order to restrict analyses to biological mothers and fathers. This was done to enhance the specificity and interpretability of caregiver roles, as legal guardians who responded to the baseline assessment may not represent the child's primary caregiver but may instead reflect those who were available to participate at the time of assessment. As a result, 6 index adolescents and their relevant legal guardian data was excluded from the analyses.

All analyses were accompanied by comprehensive reporting of results. Descriptive statistics (means and standard deviations) are presented for all study variables, along with a full correlation matrix summarizing associations among the main variables in the results section.

1. Preliminary Data Screening

Prior to hypothesis testing, data was screened for outliers and to assess the normality of continuous variables. Missing data analysis was also conducted using Little MCAR's test. In order to check for sources of bias, the z-score method was used to identify possible outliers in all continuous variables, with cutoffs set at ±3.29. Outlier scores were retained so long as they did not exceed 5% of total participants. Standardized skewness and kurtosis scores for all continuous variables were examined as part of the overall data screening process, although considering sample sizes for both mother and father-adolescent groups were above 30 participants, normality of the sampling distribution was assumed in accordance with the central limit theorem.

2. Assumptions Testing

Statistical assumptions for regression analyses were assessed to ensure validity of results for all regression models for both mother-adolescent and father-adolescent samples. The Dfbeta method was used to identify influential cases for all predictor variables with the threshold set at outside of ±1. Multicollinearity of predictor variables was assessed using Variance Inflation Factors (VIF) with the threshold set at a maximum of 4. Independence of residuals was examined using the Durbin–Watson test, with acceptable values not exceeding 4. To assess normality of residuals for each regression model, histograms of residuals were plotted for visual inspection to assess their distribution. The assumptions of homoscedasticity and linearity of the relationships between each predictor variable and the dependent variable was assessed for each regression model through visual inspection of scatterplots to ensure no funnel shape of residuals was detected and no significant curvilinear patterns were found.

3. Regression Analysis (Hypotheses 1 & 2)

In the present study, adolescent mental health, as measured by the PSC-35 and its subscale scores, were the only outcome variables and were reported by the adolescent. Adolescent-reported family functioning was included as a predictor in the regression analyses, without including parent observations of this same variable. Parent variables included in the regression models as predictors represented self-reported observations of their own parenting practices and mental health and therefore did not constitute repeated measurements of the outcome. Therefore, it was deemed sufficient

to conduct hierarchical multiple regression analyses, without the need for a multilevel modeling approach as the assumption of independence of observations was considered met, considering that the outcome variable did not involve multiple observations. Furthermore, no evidence of multicollinearity was detected between predictor variables.

Throughout the regression analyses, adolescent gender, parent and adolescent age, household level monthly socioeconomic status, and number of potentially traumatic events and adverse events experienced by the adolescent were treated as control variables for their potential confounding influence on study outcomes.

a. Hypothesis 1 To test whether parent mental health (K-6 total scores) positively predicts better adolescent mental health (PSC-35 total scores), hierarchical multiple regression analyses was conducted for each of the mother-adolescent and father-adolescent samples separately. All control variables were entered in Block 1, and maternal or paternal mental health added in Block 2. The outcome variable was adolescent mental health. An Anova was conducted to compare the two models.

Sensitivity analyses further examined the specific associations between parent mental health (K-6 total scores) and each of the three adolescent mental health domains (PSC-35 subscales: internalizing, externalizing, and attention), and were conducted separately for the mother-adolescent and father-adolescent samples. Separate regression models were run for each domain's scores entered as the outcome variable, with control variables entered at Block 1 and parent mental health entered at Block 2. An Anova was conducted to compare the two models for each of the 3 domains.

b. Hypotheses 2 and 2A To test whether family functioning (SCORE-15 total scores) and parenting practices (BPQ total scores) positively predict adolescent mental health (PSC-35 total scores) even after controlling for parent mental health (K-6 total scores), hierarchical multiple regression analyses were conducted for each of the mother-adolescent and father-adolescent samples separately. All control variables were entered in Block 1, along with parenting practices and adolescent-reported family functioning. In Block 2, maternal or paternal mental health were added. The outcome variable was adolescent mental health. An Anova was conducted to compare the two models.

For all regression models, R^2 values and changes in R^2 across heirarchical steps, F-statistics, and standardized regression coefficients (β), along with corresponding p-values, were reported.

4. Correlation Analysis (Hypothesis 3)

To examine the association between adolescent-reported and parent-reported family functioning (SCORE-15 total scores), Pearson's correlations were computed between the adolescent and caregivers' family functioning scores. As the primary focus of this study is on adolescent outcomes, priority was given in regression and mediation analyses to using adolescent-reported family functioning scores, as their own perceptions are most likely to impact their own mental health outcomes. Testing of the correlation between adolescent and parent-reported family functioning scores was conducted to support the use of adolescent-reported scores and to demonstrate they would not be expected to bias results as high correlations were obtained.

Results were reported as part of the section on correlations between all main study variables. Pearson's correlation coefficients (r) and corresponding significance levels were reported for all associations.

5. Mediation Analyses (Hypothesis 4)

Mediation analysis was conducted using PROCESS Model 4 in R to examine whether parenting practices and family functioning each mediated the association between maternal mental health and adolescent mental health.

Although the initial data analysis plan involved testing a parallel mediation model with both mediators entered simultaneously, the final sample size was reduced after stratifying by caregiver type (mother vs. father) and excluding legal guardians. Given the smaller final sample size for the mother-adolescent group, separate mediation models were conducted for each mediator to preserve statistical power. Control variables were not included in the mediation models considering this analyses' exploratory aim. Also, considering the relatively small sample size of the father-adolescent subsample, mediation analysis was not conducted on this group.

Mediation Model 1 For the first mediation model, maternal mental health (K-6 total scores) was entered as the independent variable with maternal parenting practices (BPQ total scores) as the mediator and adolescent mental health (PSC-35 total scores) as the dependent variable.

Mediation Model 2 For the second mediation model, maternal mental health (K-6 total scores) was entered as the independent variable with adolescent-reported family functioning (SCORE-15 total scores) as the mediator and adolescent mental health (PSC-35 total scores) as the dependent variable.

Indirect effects were estimated using bootstrapping with 5,000 resamples to generate bias-corrected 95% confidence intervals. Mediation was considered supported if the indirect effect's confidence interval did not include zero.

For each mediation model, the unstandardized regression coefficient (b) for the indirect effect (ab), corresponding bootstrapped standard errors, and 95% confidence intervals were reported, along with the direct effect's (c′) unstandardized regression coefficient, and its corresponding standard error and significance level.

CHAPTER IV

RESULTS

A. Preliminary Data Screening

Prior to hypotheses testing, the data was inspected to assess normality of continuous variables, and for missing data and outliers. Missing data analysis demonstrated that only monthly household income had over 5% missing data (9.75%), which may be explained by the sensitive nature of the question. Little MCAR's test was significant, $\chi^2(34) = 61.70$, $p = .003$, suggesting that missing data was not entirely random. Further inspection demonstrated that several variables (potentially traumatic events, adverse events, mother's K6 total score) were missing for the same case, resulting in only 0.31% missing data in each of these variables. Family nationality was also missing for one case resulting in 0.31% missing data for that variable. Considering that missing data were minimal across variables and were generally related to one case, the result of little MCAR's test was likely influenced by the sensitivity of the test and the presence of minimal missing data that was linked to the same case. Given the very low overall levels of missing data across variables, the data were considered suitable for analysis.

In order to check for sources of bias, the z-score method was used to identify possible outliers in all continuous variables, with cutoffs set at ±3.29. Two outliers were detected in index adolescent age and in mothers' scores on the Brief Parenting Questionnaire. Outlier scores were retained as they did not exceed 5% of the total sample.

Standardized skewness and kurtosis scores for all continuous variables were examined. In the sample of mothers and adolescents, only adolescent and mother-reported family functioning (SCORE-15 total score), adolescent age, and the attention and internalizing subscales of the PSC-35 measuring adolescent mental health had both standardized skewness and kurtosis scores below absolute 1. Nevertheless, considering sample size (N > 30), the assumption of normality was assumed met, in accordance with the central limit theorem.

In the sample of fathers and adolescents, all variables met the assumption of normality except household socioeconomic status and the externalizing subscale scores of the PSC-35, with standardized skewness and kurtosis scores above absolute 1. However, considering that the father-adolescent subsample constituted >30 dyads, normality was assumed in accordance with the central limit theorem.

B. Descriptive Statistics

Final analysis included 383 parents and 345 index adolescents. Amongst parents, 318 were female/mothers (83 %) and 65 were male fathers (17 %). Index adolescent gender was 158 female (45.8 %) and 187 male (54.2%). The mean age of mothers was 41.94 years (SD = 6.89) and for fathers was 46.14 years (SD= 7.67), while for index adolescents mean age was 14.11 (SD = 1.75). The majority of families were of Syrian nationality, 249 families (72.4%). The remaining families included 80 Lebanese families (23.3%), 12 families of mixed nationalities (3.4%), and 3 Palestinian families (0.9%) (see table 1). Average monthly household income in Lebanese pounds was 867,580 LBP (SD = 972,509), equivalent to around 104 USD at the time of data collection.

Table 1 Sample Characteristics

		N	%
Gender of Parent	Female	318	83
	Male	65	17
Gender of Index Adolescent	Female	158	45.8
	Male	187	54.2
Family Nationality	Lebanese	80	23.3
	Syrian	249	72.4
	Palestinian	3	0.9
	Mixed Nationality	12	3.4

Table 2 Descriptive Statistics Displaying Mean Score and Standard Deviation from the Mean for Each Variable

	Mean	SD
Index PSC-35 Score[a]	32.54	7.53
Index PSC-35 Attention Subscale Score	6.87	1.73
Index PSC-35 Internalizing Subscale Score	6.42	1.89
Index PSC-35 Externalizing Subscale Score	3.88	2.46
Index Reported SCORE-15 Score[b]	42.25	7.58
Potentially Traumatic Events	5.06	3.39
Adverse Events	18.49	2.54
Mother K-6 Score[c]	14.50	4.40
Father K-6 Score	14.00	4.81
Mother Parenting Questionnaire Score[d]	61.03	7.05
Father Parenting Questionnaire Score	61.25	7.09
Mother Reported SCORE-15 Score	43.29	8.22
Father Reported SCORE-15 Score	40.38	8.48
Household Monthly Income in LBP	867,580	972,509
Index Age	14.11	1.75
Mother Age	41.94	6.89
Father Age	46.14	7.67

Note [a]measure of adolescent mental health, [b]measure of family functioning, [c]measure of caregiver distress (proxy for caregiver mental health), [d]measure of parenting practices.

Table 2 provides means and standard deviations on all relevant study measures. The mean score on the PSC-35 for adolescent mental health was 32.54 (SD= 7.53), around the mid-range of the measure, above the general clinical cutoff of 30. The PSC-35 subscale mean scores were 6.87 (SD= 1.73), 6.42 (SD=1.89) and 3.88 (SD= 2.46) on

the Attention, Internalizing and Externalizing subscales, respectively. The mean on the PSC-35 Attention subscale approached the cut-off of 7 while the mean on the Internalizing subscale surpassed the cutoff score of 5, indicating possibility of significant attention and internalizing problems within the adolescent sample. These findings indicate that the adolescent sample reflects a population with elevated levels of psychological distress, consistent with the study's inclusion criteria. Therefore, the scores for adolescent mental health may be within a restricted range relative to general population samples.

For adolescent reported family functioning, SCORE-15 mean scores were 42.24 (SD= 7.58), while for mothers and fathers the means were 43.29 (SD= 8.22) and 40.38 (SD = 8.48) respectively, all slightly surpassing the mid-range of the measure, indicating worse family functioning and just above the clinically relevant threshold.

The mean for mothers and fathers on the Kessler Psychological Distress scale representing caregiver mental health was 14.50 (SD=4.40), and 14 (SD= 4.81) respectively, close to the mid-range of the scale, and above the clinically relevant threshold for distress. The mean score for mothers and fathers on the Brief Parenting Questionnaire reflecting parenting practices was 61.03 (SD= 7.05) and 61.25 (SD= 7.09) respectively. These means were significantly higher than the mid-range indicating higher positive parenting practices reported by caregivers.

Scores on the number of adverse and potentially traumatic events indicated that each adolescent on average experienced 5.7 potentially traumatic events (SD=3.38) and 18.49 adverse events (SD=2.55) in their lifetime.

Table 3 Overview of Measures, Scoring, and Interpretation

Measure	Abbreviation	Construct Measured	Reported By	Scoring Logic	Scoring Range
The Kessler Psychological Distress Scale (Kessler et al., 2002)	K6	Parent Distress (Mental Health)	Parent(s)	Lower score → Worse Mental Health	6 to 30 ≤17 indicates clinically relevant psychological problems
The Pediatric Symptom Checklist 35 adolescent report (Jellinek et al., 1999)	PSC-35	Adolescent Mental Health including 3 subscales (Attention, Internalizing, Externalizing domains)	Adolescent	Higher score → Worse mental health	0 to 70 ≥30 indicates clinically relevant psychological problems
Adverse Events Measure (Bosqui et al, In Press)	N/A	Number of Adverse and Potentially Traumatic Events Experienced by the adolescent	Parent on behalf of adolescent	Higher score → Higher number of adverse and/or potentially traumatic events experienced	0-36
The Systemic Clinical Outcome and Routine Evaluation Index (Stratton et al., 2014)	SCORE-15	Family Functioning	Parent(s) adolescent	Higher score → Worse Family Functioning	15 to 75 ≥40 indicates clinically relevant family dysfunction
Brief Parenting Questionnaire (Miller et al., 2025)	BPQ	Parenting Practices	Parent(s)	Higher score → Healthier Parenting Practices	24 to 72

C. Correlation Results

Pearson correlations were conducted to examine associations between main study variables (see Table 3). Significant associations were found between adolescent mental health (PSC-35 total score) and all three symptom domains, including attention ($r = .49$, $p < .001$), internalizing ($r = .54$, $p < .001$), and externalizing symptoms ($r = .56$, $p < .001$).

Greater exposure to adversity ($r = .37$, $p < .001$) and potentially traumatic events ($r = .35$, $p < .001$) were significantly associated with poorer adolescent mental health (PSC-35 total score). Greater exposure to adversity ($r = .21$ $p < .001$) and potentially traumatic events ($r = .23$, $p < .001$) were also significantly associated with poorer adolescent-reported family functioning (SCORE-15 total score).

Greater adolescent exposure to adversity and potentially traumatic events were significantly associated with poorer maternal mental health (K-6 total score) ($r = -.28$, $p < .001$; $r = -.28$, $p < .001$, respectively), as well as poorer parenting practices (BPQ total score) ($r = -.28$, $p < .001$; $r = -.20$, $p < .001$, respectively) and higher levels of family dysfunction (SCORE-15 total score) ($r = .31$, $p < .001$; $r = .32$, $p < .001$; respectively) as reported by mothers. These associations were not observed for fathers.

Worse adolescent mental health (PSC-35 total score) was significantly associated with worse maternal mental health (K-6 total score) ($r = -.35$, $p < .001$). There was also a significant negative association between all PSC-35 subscales and maternal mental health, including attention ($r = -.15$, $p < .01$), internalizing ($r = -.22$, $p < .001$), and externalizing symptoms ($r = -.19$, $p < .001$) indicating that worse maternal mental health was significantly associated with worse adolescent mental health specifically in each of the three symptom domains. Worse adolescent mental health was

also associated with worse paternal mental health ($r = -.31$, $p < .05$). Worse paternal mental health was also significantly associated with worse adolescent internalizing symptoms ($r = 51$, $p < .001$), but not with attention and externalizing symptoms. Furthermore, worse adolescent mental health (PSC-35 total score) was significantly associated with worse adolescent-reported family functioning (SCORE-15 total score) ($r = .44$, $p < .001$) as well as mother ($r = .43$, $p < .001$) and father-reported family functioning ($r = .35$, $p < .01$) (SCORE-15 total score). Finally, worse adolescent mental health (PSC-35 total score) was also significantly associated with worse parenting practices (BPQ total score) as reported by mothers ($r = -.25$, $p < .001$), but not with father-reported parenting practices.

A significant positive association was found between maternal and paternal mental health (K-6 total score) ($r = .43$, $p < .01$). Worse maternal mental health (K-6 total score) was also associated with worse maternal parenting practices (BPQ total score) ($r = .21$, $p < .001$). Furthermore, worse maternal mental health (K-6 total score) was significantly associated with worse adolescent-reported family functioning (SCORE-15 total score) ($r = -.27$, $p < .001$) and parent-reported family functioning (SCORE-15 total score) (mother: $r = -.46$, $p < .001$; father: $r = -.40$, $p < .01$).

Worse paternal mental health was also significantly associated with worse caregiver-reported family functioning (SCORE-15 total score) (mother: $r = -.41$, $p < .01$; father: $r = -.51$, $p < .001$), but not with adolescent-reported family functioning ($r = -22$, ns). No meaningful association was found between paternal mental health and paternal parenting practices ($r = .22$, ns).

Caregiver-reported family functioning (SCORE-15 total score) was strongly associated with adolescent-reported family functioning (SCORE-15 total score) (mother: $r = .57$, $p < .001$; father: $r = .54$, $p < .001$), supporting hypothesis 3 and justifying the utilization of adolescent-reported family functioning in the regression and mediation analysis. Mother and father-reported family functioning (SCORE-15 total score) were also significantly associated with one another ($r = .83$, $p < .001$). Mother and father-reported parenting practices (BPQ total score) were also significantly associated with one another ($r = .82$, $p < .001$). Finally, maternal and paternal parenting practices (BPQ total score) and mother and father-reported family functioning (SCORE-15 total score) were all significantly associated, with worse parenting practices associated with worse family functioning (maternal parenting practices with mother-reported family functioning: $r = -.53$, $p < .001$; paternal parenting practices with father-reported family functioning: $r = -.54$, $p < .001$).

Finally, demographic variables, including household socioeconomic status, adolescent gender and age, were not significantly correlated with adolescent mental health. Findings from the correlation analysis provide preliminary support for the hypothesized relationships between study variables.

Table 4 Correlation Matrix of Main Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Adolescent Mental Health	-												
2. Adolescent Mental Health-Attention Domain	0.49***	-											
3. Adolescent Mental Health-Internalizing Domain	0.54***	0.15**	-										
4. Adolescent Mental Health-Externalizing Domain	0.56***	0.03	0.03	-									
5. Adolescent-Reported Family functioning	0.44***	0.14**	0.26***	0.23***	-								
6. Potentially Traumatic Events	0.35***	0.17**	0.20***	0.27***	0.23***	-							
7. Adverse Events	0.37***	0.09	0.25***	0.27***	0.21***	0.47***	-						
8. Mother mental Health	-0.35***	-0.15**	-0.22***	-0.19***	-0.27***	-0.28***	-0.28***	-					
9. Father mental Health	-0.31*	-0.06	-0.51***	0.00	-0.20	-0.20	-0.20	0.43**	-				
10. Mother Parenting Practices	-0.25***	-0.01	-0.20***	-0.23***	-0.33***	-0.20***	-0.28***	0.21***	0.11	-			
11. Father Parenting Practices	-0.17	0.04	-0.38**	-0.16	-0.29	-0.15	-0.15	0.21	0.22	0.78***	-		
12. Mother-Reported Family functioning	0.43***	0.18**	0.25***	0.20***	0.57***	0.32***	0.31***	-0.46***	-0.41*	-0.53***	-0.57***	-	
13. Father-Reported Family Functioning	0.35**	0.04	0.41***	0.25*	0.54***	0.20	0.12	-0.40*	-0.51***	-0.49***	-0.54***	0.82***	-

*p < .05; **p < .01; ***p < .001

Note. Correlations with demographic variables (i.e. household socio-economic status, caregiver ages, adolescent age and gender) were not included in this matrix as no meaningful relationships were obtained.

D. Assumption Testing

1. Mother-adolescent Sample

Prior to conducting the regression analysis, assumption testing was undertaken on all regression models to ensure assumptions were met for regressions analysis.

Variance inflation factors (VIFs) were assessed across all regression models to examine potential multicollinearity among predictor variables. Overall, VIF values were low across models, with none exceeding 2, remaining below the commonly accepted threshold of 5, indicating no evidence of multicollinearity.

The assumption of independence of errors was assessed using the Durbin–Watson statistic, calculated for each regression model. Durbin–Watson values ranged from 1.98 to 2.11, with non-significant p-values, suggesting that the assumption of independence of errors was met.

The assumption of normality of errors was assessed by inspecting standardized residuals for outliers across all regression models using the z-score method. Four cases were found to exceed the threshold of ±3.29. However, since no influential cases were detected using the Dfbeta method (with the threshold set at outside ±1), all cases were retained. Visual inspection of histograms of residuals across all models indicated that residuals were approximately normally distributed. While minor deviations from normality were observed in some models, they did not appear substantial and therefore the assumption of normality of errors was considered met.

The assumptions of linearity and homoscedasticity were assessed by visual inspection of scatterplots of standardized residuals against predicted values for each regression model. Overall, residuals were randomly distributed around zero, with no clear patterns, suggesting that the assumption of linearity was met. While minor

deviations from linearity were observed, they were not substantial. Additionally, the distribution of residuals appeared relatively constant across levels of predicted values, with no clear funnel shape, indicating the assumption of homoscedasticity was met.

2. Father-adolescent Sample

Prior to conducting the regression analysis, assumption testing for all regression models was undertaken to ensure assumptions were met for regressions analysis.

Variance inflation factors (VIFs) were assessed across all regression models to examine potential multicollinearity among predictor variables. Overall, VIF values were low across models, with none exceeding 2, remaining below the commonly accepted threshold of 5, indicating no evidence of multicollinearity.

The assumption of independence of errors was assessed using the Durbin–Watson statistic, calculated for each regression model. Durbin–Watson statistics across regression models ranged from 1.54 to 2.08, with non-significant p-values, suggesting that the assumption of independence of errors was met.

The Dfbeta method was used to identify influential cases for all predictor variables for all regression models, with the threshold set at outside ±1. One influential case was detected. Sensitivity analysis was undertaken to assess this case's influence on relevant regression models where it was found to be influential. While it did not exert large influences, it variably impacted the significance of certain predictors, with the general trend demonstrating an increase in predictor significance following removal of the case. Nevertheless, it was considered appropriate to retain the case in the analyses in order to preserve the natural variability of the data and avoid biasing the results.

The assumption of normality of errors was assessed by inspecting standardized residuals for outliers across all regression models using the z-score method. One case

was found to exceed the threshold of ±3.29. A comparison of models was conducted with and without this case indicating no notable changes in model fit, significance levels, or standardized coefficients. The case was therefore retained. Visual inspection of histograms of residuals across all models indicated that residuals were approximately normally distributed. While minor deviations from normality were observed in some models, they did not constitute substantial deviations from normality. Therefore, the assumption of normality of errors was considered met.

The assumptions of linearity and homoscedasticity were assessed by visual inspection of scatterplots of standardized residuals against predicted values for each regression model. Overall, residuals were randomly distributed around zero, with no clear evidence of heteroscedasticity. Some minor non-linear patterns were observed in several models, suggesting minor deviations from linearity, but not sufficiently substantial to determine the data does not meet the assumption of linearity. The greater variability in residual patterns noted in the father-adolescent sample data compared to the main analyses data may likely be due to the significantly smaller sample size. Overall, regression assumptions were considered to be broadly met, and results were interpreted with caution for this subsample.

E. Regression Analysis

1. Mother-Adolescent Sample

a. Maternal mental health as predictor of adolescent mental health A hierarchical multiple regression analysis was conducted to examine whether maternal mental health predicted adolescent mental health above and beyond demographic and contextual factors. In block 1, control variables were entered into the model including monthly

household socioeconomic status, adolescent age, mother's age, adolescent gender, and adolescent exposure to potentially traumatic events and adverse events.

The block 1 model was significant, explaining 18 % of the variance in adolescent mental health ($R^2 = .18$, $F(6, 278) = 9.83$, $p < .001$). Exposure to potentially traumatic events ($\beta = .23$, $p < .001$) and adverse events ($\beta = .24$, $p < .001$) were significant predictors of adolescent mental health difficulties, suggesting that higher levels of adversity were associated with greater adolescent mental health difficulties. No other control variables were significant predictors.

In Block 2, maternal mental health was added to the model. This model was also significant and accounted for 23% of the variance in adolescent mental health ($R^2 = .23$, $F(7, 277) = 11.89$, $p < .001$). Maternal mental health was a significant predictor ($\beta = -.25$, $p < .001$), such that worse maternal mental health was associated with higher levels of adolescent mental health difficulties. Exposure to traumatic events ($\beta = .19$, $p < .01$) and adverse events ($\beta = .19$, $p < .01$) remained significant predictors, although their effects were slightly attenuated. The inclusion of maternal mental health significantly improved model fit ($\Delta R^2 = .06$), $F(1, 277) = 20.16$, $p < .001$), indicating that maternal mental health explained an additional 6% of variance in adolescent mental health (See table 5).

b. Sensitivity analysis of maternal mental health as predictor of adolescent health sub-domains Three separate hierarchical multiple regression analyses were conducted to examine whether maternal mental health predicted each of the adolescent mental health sub-domains measured by the PSC-35 (Attention, Internalizing and Externalizing symptoms) above and beyond demographic and contextual factors. Each of the

subdomains were entered as separate outcomes, with control variables entered in Block 1, and maternal mental health entered in Block 2.

i. Attention domain

For the attention domain, the Block 1 model including only control variables as predictors was significant explaining 5% of variance in attention problems ($R^2 = .05$, $F(6, 278) = 2.62$, $p < .05$). Among the control variables, only exposure to potentially traumatic events was a significant predictor ($\beta = .15$, $p = .034$), indicating that greater exposure to traumatic events was associated with higher attention difficulties.

Maternal mental health was added to the model in Block 2. The model remained significant, explaining 6.4% of the variance in attention problems ($R^2 = .06$, $F(7, 277) = 2.70$, $p < .05$). However, maternal mental health was not a significant predictor of attention problems ($\beta = -.11$, $p = .082$), although it approached statistical significance. Exposure to potentially traumatic events was no longer a significant predictor. A comparison of the two models indicated that the inclusion of maternal mental health did not significantly improve model fit, adding only 1% of variance ($\Delta R^2 = .01$, $F(1, 277) = 3.04$, $p = .082$).

ii. Internalizing domain

For the internalizing domain, the Block 1 model including only control variables as predictors was significant, explaining 8.1% of the variance in internalizing symptoms ($R^2 = .08$, $F(6, 278) = 4.06$, $p < .001$). Monthly household Socioeconomic status ($\beta =$

−.12, $p < .05$) and adverse events (β = .19, $p < .01$) emerged as significant predictors, indicating that lower socio-economic status and higher levels of adversity were associated with greater internalizing difficulties.

Maternal mental health was added to the model in Block 2. The model remained significant, explaining 11.5% of the variance in internalizing symptoms ($R^2 = .12$, $F(7, 277) = 5.14$, $p < .001$). Maternal mental health was a significant predictor (β = −.20, $p < .01$), such that worse maternal mental health was associated with higher levels of adolescent internalizing symptoms. Monthly household socioeconomic status (β = −.13, $p < .05$) and adverse events (β = .15, $p < .05$) remained significant predictors. A comparison of the models indicated that the inclusion of maternal mental health significantly improved model fit, contributing 3% additional variance ($\Delta R^2 = .03$, $F(1, 277) = 10.78$, $p < .01$).

iii. Externalizing domain

For the externalizing domain, the Block 1 model including only control variables as predictors was significant, explaining 10.5% of the variance in externalizing symptoms ($R^2 = .10$, $F(6, 278) = 5.42$, $p < .001$). Among the control variables, exposure to potentially traumatic events was a significant predictor (β = .23, $p < .001$), while adverse events showed a marginal association (β = .13, $p = .051$), indicating that greater exposure to potentially traumatic events and adverse events was associated with higher externalizing difficulties.

Maternal mental health was added to the model in Block 2. The model remained significant, explaining 11.8% of the variance in externalizing symptoms ($R^2 = .12$, $F(7, 277) = 5.30$, $p < .001$). Maternal mental health was a significant predictor ($\beta = -.12$, $p < .05$), indicating that worse maternal mental health was associated with higher levels of adolescent externalizing symptoms. Exposure to traumatic events remained a significant predictor ($\beta = .20$, $p < .01$), while adverse events was no longer significant. A comparison of the models indicated that the inclusion of maternal mental health significantly improved model fit ($\Delta R^2 = .01$, $F(1, 277) = 4.21$, $p < .01$) contributing 1% of additional variance (see Table 6).

c. Parenting practices and family functioning as predictors of adolescent mental health over and above maternal mental health A hierarchical multiple regression analysis was conducted to examine whether parenting practices and family functioning predicted adolescent mental health, and whether these associations remained after controlling for maternal mental health.

In Block 1, control variables were entered along with maternal parenting practices and adolescent-reported family functioning. The model was statistically significant, explaining 30.9% of the variance in adolescent mental health ($R^2 = .31$, $F(8, 276) = 15.41$, $p < .001$). Adolescent-reported family functioning emerged as a strong and significant predictor ($\beta = .37$, $p < .001$), indicating that poorer family functioning was associated with greater adolescent psychological problems. Parenting practices were not a significant predictor ($\beta = -.03$, $p = .527$). Exposure to traumatic events ($\beta = .17$, $p < .01$) and adverse events ($\beta = .19$, $p < .01$) were also significant predictors.

Maternal mental health was added to the model in Block 2. The model remained significant, explaining 33.6% of the variance in adolescent mental health ($R^2 = .34$, $F(9, 275) = 15.45$, $p < .001$). Maternal mental health was a significant predictor ($\beta = -.18$, $p < .001$), such that worse maternal mental health was associated with higher levels of adolescent psychological difficulties. Importantly, adolescent-reported family functioning remained a significant predictor ($\beta = .34$, $p < .001$), whereas parenting practices remained non-significant ($\beta = -.01$, $p = .830$). Exposure to traumatic events ($\beta = .14$, $p < .05$) and adverse events ($\beta = .16$, $p < .01$) also remained significant. A comparison of the models indicated that the inclusion of maternal mental health significantly improved model fit ($\Delta R^2 = .03$, $F(1, 275) = 11.21$, $p < .001$) contributing 3% of additional variance (see Table 7).

2. Father-Adolescent Sample

a. Paternal mental health as predictor of adolescent mental health A hierarchical multiple regression analysis was conducted to examine whether paternal mental health predicted adolescent mental health above and beyond demographic and contextual factors. In Block 1, control variables were entered into the model including monthly household socioeconomic status, adolescent age, father's age, adolescent gender, and adolescent exposure to potentially traumatic events and adverse events.

The Block 1 model was significant, explaining 25.7% of the variance in adolescent mental health ($R^2 = .26$, $F(6, 56) = 3.23$, $p < .01$). Adolescent gender ($\beta = -.27$, $p < .05$) and adverse events ($\beta = .37$, $p < .01$) were found to be significant predictors, indicating that male adolescents reported lower levels of psychological

difficulties compared to female adolescents and that greater exposure to adversity was associated with higher levels of adolescent mental health difficulties.

Paternal mental health was added to the model in Block 2. The model remained significant, explaining 29.9% of the variance in adolescent mental health ($R^2 = .30$, $F(7, 55) = 3.36$, $p < .01$). Paternal mental health was not a significant predictor ($\beta = -.22$, $p = .074$), although it approached significance. Adolescent gender ($\beta = -.28$, $p < .05$) and adverse events ($\beta = .33$, $p < .05$) remained significant predictors. A comparison of the models indicated that the inclusion of paternal mental health did not significantly improve model fit ($\Delta R^2 = .04$, $F(1, 55) = 3.31$, $p = 074$) (see Table 8).

b. Sensitivity analysis of paternal mental health as predictor of adolescent health sub-domains Three separate hierarchical multiple regression analyses were conducted to examine whether paternal mental health predicted each of the adolescent mental health sub-domains measured by the PSC-35 (Attention, Internalizing and Externalizing symptoms) above and beyond demographic and contextual factors. Each of the subdomains were entered as separate outcomes, with control variables entered in Block 1, and paternal mental health entered in Block 2.

i. Attention domain

For the attention domain, the Block 1 model including only control variables as predictors was not significant ($R^2 = .14$, $F(6, 56) = 1.52$, $p = .189$). None of the predictors reached statistical significance.

Paternal mental health was added to the model in Block 2. The model remained non-significant, ($R^2 = .14$, $F(7, 55) = 1.29$, $p = .271$) with almost no additional variance contributed. Paternal mental health was not a significant predictor of attention problems ($\beta = -.04$, $p = .765$), and no other predictors were significant in the model. Comparison of the models indicated that the inclusion of paternal mental health did not significantly improve model fit ($\Delta R^2 = .001$, $F(1, 55) = 0.09$, $p = .765$).

ii. Internalizing domain

For the internalizing domain, the Block 1 model including only control variables as predictors was not significant, ($R^2 = .12$, $F(6, 56) = 1.30$, $p = .271$). Among the predictors, adverse events emerged as a significant predictor ($\beta = .31$, $p < .05$), indicating that higher levels of adversity were associated with greater internalizing symptoms.

Paternal mental health was added to the model in Block 2. The model became significant, explaining 32.6% of the variance in internalizing symptoms ($R^2 = .33$, $F(7, 55) = 3.80$, $p < .01$). Paternal mental health emerged as a significant predictor ($\beta = -.47$, $p < .001$), indicating that worse paternal mental health was associated with higher levels of adolescent internalizing symptoms. None of the control variables remained statistically significant. Comparison of models indicated that the inclusion of paternal mental health significantly improved model fit ($\Delta R^2 = .20$, $F(1, 55) = 16.62$, $p < .001$), contributing an additional 20% of variance in adolescent internalizing symptoms beyond the control variables.

iii. Externalizing domain

For the externalizing domain, the Block 1 model including only control variables as predictors was not significant, ($R^2 = .08$, $F(6, 56) = 0.84$, $p = .545$). None of the predictors were statistically significant.

Paternal mental health was added to the model in Block 2. The model remained non-significant, ($R^2 = .09$, $F(7, 55) = 0.74$, $p = .642$). Paternal mental health was not a significant predictor ($\beta = .06$, $p = .665$), and no other predictors reached statistical significance. Comparison of the models indicated that the inclusion of paternal mental health did not significantly improve model fit, ($\Delta R^2 = .003$, $F(1, 55) = 0.19$, $p = .665$) (see Table 9).

c. Parenting practices and family functioning as predictors of adolescent mental health over and above paternal mental health

A hierarchical multiple regression analysis was conducted to examine whether parenting practices and family functioning predicted adolescent mental health, and whether these associations remained after controlling for paternal mental health.

In Block 1, control variables were entered along with paternal parenting practices and adolescent-reported family functioning. The model was significant, explaining 34.3% of the variance in adolescent mental health ($R^2 = .34$, $F(8, 54) = 3.53$, $p < .01$). Adverse events ($\beta = .35$, $p < .01$) and adolescent gender ($\beta = -.24$, $p < .05$) were significant predictors, indicating that male adolescents reported lower levels of mental health difficulties compared to female adolescents and that greater exposure to adversity was associated with higher levels of adolescent mental health difficulties.

Adolescent-reported family functioning (β = .31, $p < .05$) was also a significant predictor, suggesting that poorer family functioning was associated with greater adolescent psychological problems. Paternal parenting practices were not significant (β = −.03, $p = .774$).

Paternal mental health was added to the model in Block 2. The model remained significant, accounting for 36.8% of the variance in adolescent mental health ($R^2 = .37$, $F(9, 53) = 3.43$, $p < .01$). Adverse events (β = .32, $p < .05$), adolescent gender (β = −.24, $p < .05$), and adolescent-reported family functioning (β = .29, $p < .05$) remained significant predictors. Paternal mental health was not a significant predictor (β = −.17, $p = .156$), and paternal parenting practices remained non-significant (β = −.00, $p = .976$). Comparison of the models indicated that the inclusion of paternal mental health did not significantly improve model fit ($\Delta R^2 = .025$, $F(1, 53) = 2.07$, $p = .156$) (see Table 10).

Table 5 Summary of Hierarchical Regression Models Examining Maternal Mental Health as Predictor of Adolescent Mental Health

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.418	.175	.157	7.17	-	-	6	278	-
2	.481	.231	.212	6.94	.056	20.16	1	277	< .001

Note.

Predictors (Model 1): monthly household income, adolescent age, mother age, adolescent gender, traumatic exposure, adverse events.
Predictors (Model 2): monthly household income, adolescent age, mother age, adolescent gender, traumatic exposure, adverse events, Maternal mental health
Outcome variable: Adolescent mental health (Total PSC-35 scores).

Table 6 Summary of Hierarchical Regression Models Examining Maternal Mental Health as Predictor of Adolescent Mental Health Subscales

Subscale	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
Attention	1	.231	.054	.033	1.736	—	—	6	278	—
	2	.253	.064	.040	1.730	.010	3.04	1	277	= .082
Internalizing	1	.284	.081	.061	1.849	—	—	6	278	—
	2	.339	.115	.093	1.817	.034	10.78	1	277	< .001
Externalizing	1	.324	.105	.085	2.436	—	—	6	278	—
	2	.344	.118	.096	2.422	.013	4.21	1	277	< .001

Note.

Predictors (Model 1): monthly household income, adolescent age, mother age, adolescent gender, traumatic exposure, adverse events.
Predictors (Model 2): monthly household income, adolescent age, mother age, adolescent gender, traumatic exposure, adverse events, Maternal mental health.
Outcome variable in subscale column

Table 7 Summary of Hierarchical Regression Models Examining Maternal Parenting Practices and Family Functioning as Predictors of Adolescent Mental Health Over and Above Maternal Mental Health

Model	R	R^2	Adjusted R Square	Std. Error of Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.556	.309	.289	6.591	—	—	8	276	—
2	.580	.336	.314	6.472	.027	11.21	1	275	< .001

Note

Predictors (Model 1): monthly household income, adolescent age, mother age, adolescent gender, traumatic exposure, adverse events, maternal parenting practices and family functioning.
Predictors (Model 2): monthly household income, adolescent age, mother age, adolescent gender, traumatic exposure, adverse events, maternal parenting practices and family functioning, and Maternal mental health.
Outcome variable: Adolescent mental health (Total PSC-35 scores).

Table 8 Summary of Hierarchical Regression Models Examining Paternal Mental Health as Predictor of Adolescent Mental Health

Model	R	R^2	Adjusted R Square	Std. Error of Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.507	.257	.178	6.986	—	—	6	56	—
2	.547	.299	.210	6.846	.042	3.31	1	55	=.074

Note.

Predictors (Model 1): monthly household income, adolescent age, father age, adolescent gender, traumatic exposure, adverse events.
Predictors (Model 2): monthly household income, adolescent age, father age, adolescent gender, traumatic exposure, adverse events, Paternal mental health
Outcome variable: Adolescent mental health (Total PSC-35 scores).

Table 9 Summary of Hierarchical Regression Models Examining Paternal Mental Health as Predictor of Adolescent Mental Health Subscales

Outcome	Model	R	R^2	Adjusted R Square	Std. Error of Estimate	R Square Change	F Change	df1	df2	Sig. F Change
Attention	Model 1	.374	.140	.048	1.582	—	—	6	56	—
	Model 2	.376	.141	.032	1.595	.001	0.09	1	55	=.765
Internalizing	Model 1	.350	.123	.029	1.931	—	—	6	56	—
	Model 2	.571	.326	.241	1.707	.203	16.62	1	55	< .001 ***
Externalizing	Model 1	.287	.083	-.016	2.559	—	—	6	56	—
	Model 2	.293	.086	-.031	2.578	.003	0.19	1	55	=.665

Note.

Predictors (Model 1): monthly household income, adolescent age, fatherr age, adolescent gender, traumatic exposure, adverse events.
Predictors (Model 2): monthly household income, adolescent age, father age, adolescent gender, traumatic exposure, adverse events, Paternal mental health.
Outcome variable in subscale column

Table 10 Summary of Hierarchical Regression Models Examining Paternal Parenting Practices and Family Functioning as Predictors of Adolescent Mental Health Over and Above Paternal Mental Health

Model	R	R^2	Adjusted R Square	Std. Error of Estimate	R Square Change	F Change	df1	df2	Sig. F Change
Model 1	.586	.343	.246	6.689	—	—	8	54	—
Model 2	.607	.368	.261	6.623	.025	2.07	1	53	=.156

Note

Predictors (Model 1): monthly household income, adolescent age, father age, adolescent gender, traumatic exposure, adverse events, paternal parenting practices and family functioning.
Predictors (Model 2): monthly household income, adolescent age, father age, adolescent gender, traumatic exposure, adverse events, paternal parenting practices and family functioning, and paternal mental health.
Outcome variable: Adolescent mental health (Total PSC-35 scores).

F. Mediation Analysis

1. Parenting Practices as Mediator of Association Between Maternal and Adolescent Mental Health

The first mediation model examined whether maternal parenting practices mediated the association between maternal mental health and adolescent mental health. Maternal K-6 scores for maternal psychological distress were entered as the independent variable, and adolescent PSC-35 scores for adolescent mental health were entered as the dependent variable, with maternal BPQ score for parenting practices entered as the mediator.

The indirect effect of maternal mental health on adolescent mental health through maternal parenting practices was significant ($b = -0.07$, BootSE = 0.03, 95% CI [−0.12, −0.02]), as the confidence interval did not include zero. This indicates that maternal parenting practices partially mediated the association between maternal and adolescent mental health. The direct effect of maternal mental health on adolescent mental health was significant ($b = -0.54$, $SE = 0.09$, $p < .001$), indicating therefore only partial mediation.

2. Family Functioning as Mediator of Association Between Maternal and Adolescent Mental Health

The second mediation model examined whether family functioning mediated the association between maternal mental health and adolescent mental health. Maternal K-6 scores for maternal psychological distress were entered as the independent variable, and

adolescent PSC-35 score for adolescent mental health were entered as the dependent variable, with adolescent reported SCORE-15 scores for family functioning entered as the mediator.

The indirect effect of maternal mental health on adolescent mental health through adolescent-reported family functioning was significant, (b = −0.18, BootSE = 0.04, 95% CI [−0.26, −0.10]), as the confidence interval did not include zero. This indicates that adolescent-reported family functioning significantly mediated the association between maternal and adolescent mental health. The direct effect of maternal mental health on adolescent mental health remained significant, (b = −0.43, SE = 0.09, p < .001), indicating therefore only partial mediation.

CHAPTER V

DISCUSSION

The present study sought to examine the association between parent and adolescent mental health in a conflict-affected populations, with particular emphasis on exploring the role of key family systemic processes, namely parenting practices and overall family functioning, in mediating this association. Studies on conflict-affected children have largely focused on direct exposure to traumatic events as the most prominent risk factor associated with adverse mental health outcomes (Meyer et al., 2017). The present study's theoretical framework is grounded in the socioecological model and in family systems theory. As such, the study's conceptual approach sought to move beyond a focus on the direct impact of adversity on adolescent mental health to better understand how family relational dynamics may serve as mechanisms that translate broader contextual realities onto adolescent psychological adjustment. While the cross-sectional nature of the study precludes causal and unidirectional interpretations of findings, results are interpreted with focus on adolescent adjustment and its association with parent mental health and family related constructs, with full recognition that associations are likely bidirectional.

It is important to recognize that the study's inclusion criteria resulted in an adolescent sample presenting with elevated psychological distress. Parents also generally displayed clinical levels of psychological distress. Therefore findings must be interpreted in this context, considering that the associations observed reflect variation within a high-risk population. The elevated levels of distress observed in both adolescents and parents may have resulted in restricted variability in scores which can results in the statistical attenuation of associations, as reduced variability limits the

ability to detect differences between individuals. Therefore, the associations identified in the current study may represent conservative estimates of the true relationships between parent and adolescent mental health and family processes.

The stratification of the sample by parent role (mother/father) allows for a more nuanced examination of the associations of interest and offers specific insight into potential variability in these associations across parent roles. The separate focus on father-adolescent dyads provides valuable insight into an area that has historically been under-researched, as research and intervention design have largely prioritized the mother–child dyad, have rarely disaggregate findings by parent gender, and have often been designed in ways that pose barriers to father engagement (Panter-Brick et al., 2014). As such, the inclusion of fathers in the present study contributes to addressing this gap and recognizes the fundamental and unique influence fathers have on child developmental outcomes.

Overall, findings strongly supported expected associations in the mother-adolescent sample. In the main regression analyses, maternal mental health was found to be a significant predictor of adolescent mental health, even after controlling for demographic and contextual factors. Importantly, maternal mental health contributed additional variance beyond exposure to adversity to adolescent mental health, which highlights its importance as a particularly meaningful correlate of adolescent mental health in conflict-affected settings, in line with findings from other conflict-affected populations (Bernhardt et al., 2024; East et al., 2018; McEwen et al., 2023; Popham et al., 2024). Results of the mediation analysis further substantiate the association between mother and adolescent mental health by demonstrating a significant direct effect of

maternal mental health onto adolescent adjustment, even when considering relational factors. Popham et al., (2024) and Sim et al. (2019) observed similar relationships in samples of Syrian refugee mother-child dyads. Such findings further emphasize the importance of maternal psychological functioning as a key determinant of adolescent mental health, through additional pathways not captured in the current research.

Results from the sensitivity analysis conducted examining the association between maternal mental health and specific adolescent mental health domains demonstrated that this association was significant for the internalizing and externalizing domains but not for the attention-related difficulties. The associations between maternal mental health and child internalizing and externalizing symptoms are consistent with findings from other research on conflict-affected populations examining these relationships in adolescent samples in particular (Betancourt et al., 2012) and in a wider age range of children (Eruyar et al., 2018).

Paternal mental health was not a significant predictor of overall adolescent mental health and emerged as a strong predictor of adolescent internalizing symptoms only. Evidence from meta-analysis in non-conflict populations indicates that associations between parent depression and children's internalizing and externalizing problems were generally stronger for mothers than for other caregivers (Ivanova et al., 2022). These results suggest that maternal mental health may be particularly relevant to adolescents' emotional and behavioral adjustment. Considering the socio-cultural context of the study sample, mothers typically function as the primary caregiver while fathers are often the primary breadwinners. Considering these contextually relevant caregiver role differences, mother's distress may better predict child problems in the

current sample while conversely, mothers may be more significantly impacted by their children's mental health difficulties worsening their distress as compared to other caregivers (Ivanova et al., 2022). It is important to recognize that the scale used to assess parent mental health (The Kessler Psychological Distress Scale; Kessler et al., 2002) measures internalizing symptoms of anxiety and depression and does not assess externalizing symptoms. In the father-adolescent sub-sample, this may account for the lack of an association between paternal mental health and children's externalizing behavior as research has shown that father's externalizing behaviors in particular are linked to children's externalizing symptoms (Fisher, 2017).

Nevertheless, it is important to note that the lack of a significant association between paternal and overall adolescent mental health should be interpreted with caution. Research in non-conflict affected populations demonstrates that fathers play a direct, fundamental, and long-term role in promoting children's health and that paternal mental health has been linked to both externalizing and internalizing symptoms in children (see review by Fisher, 2017). Therefore, the absence of an association found in the current study is likely due to the smaller sample size in the father-adolescent subsample, which may have limited statistical power to detect effects.

The lack of association found between parent mental health and adolescent attention symptoms is contrary to prior research which found that maternal depression and anxiety symptoms were significantly associated with all psychological domains of child mental health including attention, internalizing and externalizing symptoms (Michalek et al., 2024). However, attention is predominantly a neurocognitive function and therefore understandably, may not be directly associated with parent's internalizing problems as measured in this study as a proxy of parent mental health.

In conflict-affected populations, direct exposure to adversity and trauma may be more relevant to attention-related symptoms in children in comparison to parent internalizing symptoms. A significant association emerged between exposure to potentially traumatic events and adolescent attention problems in the mother-adolescent sample. Prior to adding maternal mental health to the model, exposure to potentially traumatic events emerged as a significant predictor of adolescent attention symptoms and the model was significant. When maternal mental health was added to the model, this effect was attenuated although exposure to traumatic events and maternal mental health emerged as marginally significant predictors of attention symptoms. Findings in the literature demonstrate significant links between increased exposure to family and interpersonal traumatic events and child cognitive functioning (see Hazer & Gredebäck, 2023), while this link has not been established with war-related traumatic exposure in children above pre-school age and adolescent's executive functioning (Chen et al., 2019; Scharpf et al., 2022). The measure of exposure to traumatic events used in the current study encompasses both war-related and family-related potentially traumatic events, which may explain why an association was found between adolescent traumatic exposure and attention problems. Future research may benefit from assessing the association between attention-related difficulties and traumatic exposure while segregating by trauma type. From a socioecological and systems perspective, this finding broadly demonstrates how different domains of child functioning may be differentially influenced by processes in distinct levels of the child's environment and that family level factors and relational processes (i.e. mother mental health and exposure to relational trauma) may serve to buffer or accentuate the effects of broader risk factors.

A key finding of the study is the consistent and significant association between family functioning and adolescent mental health. Across regression models in both the mother-adolescent and father-adolescent samples, adolescent-reported family functioning emerged as a strong predictor and remained significant even when parent mental health was included. These findings, along with evidence demonstrating that positive family processes are associated with more positive child developmental outcomes (Hyunh & Li, 2025; Panter-Brick et al., 2011), and that lower family functioning is associated with higher levels of child psychopathology in conflict-affected populations (Panter-Brick et al., 2011), suggest that broader relational dynamics within the family system may have a unique association with adolescent mental health outcomes even when considering the contribution of parent mental health.

A unique contribution of the current study is the finding that family functioning also emerged as significant mediator in the association between maternal and adolescent mental health. To the author's knowledge, no prior studies have examined the role of overall family functioning as a potential mediator of the association between parent and child mental health in conflict-affected populations, with existing mediation studies having strictly examined parenting behaviors (e.g. Popham et al., 2024; Sim et al., 2019). This particular finding is in line with intervention research demonstrating that programs designed to strengthen family relationships and improve parenting capacities in conflict-affected populations ultimately improve child mental health outcomes (Bosqui et al., 2024; Bosqui & Marshoud, 2018; Bunn et al., 2022; Pedersen et al., 2019). Taken together, these findings suggest that family functioning may represent a key mechanism through which parent mental health is associated with adolescent psychological adjustment.

In contrast, parenting practices did not emerge as a significant predictor of adolescent mental health in the regression models for both the mother-adolescent and father-adolescent samples. This was somewhat unexpected given research linking parenting behaviors such as harsh parenting and behavioral control, and parental support and monitoring to child developmental outcomes (Eltanamly et al., 2021; Tol et al., 2013). One possible explanation for this finding may be that the parenting practices construct assessed in this study captures dyadic and behaviorally focused parent–child interactions, encompassing two dimensions of responsive and harsh parenting (see Miller et al., 2025). Therefore, parenting practices in this sense may reflect a specific component of the adolescent's family environment. In contrast, the family functioning construct measured in this study encompasses broader systemic dynamics, which include patterns of family-level communication, cohesion, and problem-solving (see Stratton et al., 2014). In this light, family functioning may represent a more comprehensive and ecologically relevant indicator of the adolescent's lived family experience beyond the simple behavioral layers of inter-personal family dynamics, consequently exerting a stronger influence on adolescent mental health.

While parenting practices did not emerge as a significant predictor of adolescent mental health in the regression analyses, they were found to partially mediate the association between maternal and adolescent mental health. A very similar pattern was reported by Sim et al. (2019), where parenting behavior did not have direct effects on child mental health but partially mediated the association between maternal mental health and child adjustment. The findings therefore provide further support to the limited body of research conducted in similar conflict-affected populations examining

the mediating role of parenting practices in the association between caregiver and child mental health (e.g., Popham et al., 2024; Sim et al., 2018).

Considering the findings from both the regression and mediation analyses, overall they implicate the important role of both relational constructs in the association between parent and adolescent mental health. At the same time, considering the differences in the associations between family functioning and parenting practices with adolescent mental health, the findings potentially demonstrate that parenting practices may serve as one pathway through which parent mental health influences adolescent adjustment, while broader family functioning may encompass both dyadic relational elements while simultaneously capturing more pervasive relational processes that exert wider-reaching influences on child adjustment. This finding may have important preliminary practical implications for intervention research, as it may indicate that approaches that focus on targeting parenting behaviors specifically may have variable impact on adolescent outcomes as compared to those that target the broader family system.

It is important to note that the mean scores on the parenting practices measure were significantly above the mid-range indicating more positive parenting practices. Considering each parent was reporting strictly on their own parenting practices, responses may have been influenced by social desirability bias. This may not have been the case with the family functioning measure as parents reported on broader family dynamics, therefore rendering scores potentially less susceptible to direct self-evaluative bias. As a result, the potentially inflated scores would have introduced measurement error, where scores would not have captured meaningful differences in

parenting practices. This may have ultimately attenuated its association with adolescent mental health and restricted the possibility for it to emerge as a significant predictor in the regression analyses and would explain its relatively smaller mediation effect as compared to family functioning.

Across both maternal and paternal regression models, exposure to adverse and potentially traumatic events emerged repeatedly as significant predictors of adolescent mental health difficulties. This aligns with research indicating that direct traumatic event exposure and adversity play a central role in shaping child mental health outcomes in conflict-affected settings (Meyer et al., 2017). Yet, while direct exposure to traumatic events and adversity may exert a strong influence on children's psychological adjustment particularly relating to post-traumatic stress symptoms (Eruyar et al., 2018; Panter-Brick, 2011), the current study along with other research demonstrate that family processes (Panter-Brik et al., 2011; Popham et al., 2024; Sim et al., 2019) and caregiver/parent mental health (Eruyar et al., 2018; Meyer et al., 2017; Popham et al., 2024; Sim et al., 2019) continue to play a critical role in shaping broader psychological functioning in such contexts. This is in light of the finding that although exposure to adversity and traumatic events were significant predictors of adolescent mental health along with family functioning, the addition of maternal mental health resulted in the attenuation of the significance of exposure to adversity as a predictor, while exposure to potentially traumatic events no longer remained significant. Nevertheless, overall these findings also underscore the importance of accounting for the effect of ongoing exposure to potentially traumatic events and chronic daily stressors when investigating psychological adjustment in conflict-affected populations, and in intervention planning (Miller & Rasmussen, 2010). While healthy parent adjustment and positive family

processes appear to play a significant protective role in buffering against the effects of contextual adversity on adolescent psychological adjustment, they do not offer a complete shield against the influence of these factors.

Mixed findings emerged regarding the association between adolescent gender and adolescent adjustment. Gender differences were found only in the father-adolescent sample, with female adolescents reporting higher levels of psychological difficulties, consistent with some evidence from conflict-affected populations around the increased vulnerability to mental health difficulties among adolescent girls (Eruyar et al., 2018; Meyer et al., 2017). However, since this finding did not emerge in the larger mother-adolescent sample and considering the relatively smaller size of the father-adolescent sample, it should be interpreted with caution as it may not reflect a consistent gender-related effect within the present sample. The relatively small father-adolescent sample may have increased the risk of error in the detection and estimation of associations.

A study of an adolescent sample in Lebanon found no differences in psychiatric disorders across genders (Maalouf et al., 2016). In contrast, a prevalence study on common mental health disorders in Syrian refugee children living in informal tented settlements in Lebanon found differences between genders in overall prevalence with 10% more boys meeting criteria for common mental health disorders, although the mean age of the sample was 12 years (McEwen et al., 2023). Such mixed findings may demonstrate a lack of a consistent gender-related trend in mental health problem prevalence in conflict-affected populations in Lebanon.

Considering the lack of an association between gender and adolescent mental health in the larger mother-adolescent sample, this finding may indicate that adolescent

boys and girls from conflict-affected populations in Lebanon may experience comparable levels of exposure to chronic adversity, contributing to broadly similar impacts on their psychological adjustment. Gender-differences may instead be related to the types of adversities faced (e.g. girls may face higher risk of child-marriage while boys may face higher risk of exploitative and harsh labor) and in the specific forms of psychological difficulties that develop. Interestingly, important gender-related differences in prevalence of specific *types* of mental health disorders were found amongst Syrian children in informal tented settlements in Lebanon (McEwen et al., 2023).

CHAPTER VI

LIMITATIONS, STRENGTHS, AND FUTURE DIRECTIONS

This study's findings should be interpreted in light of several limitations. Primarily, the cross-sectional design prevents causal inferences regarding the directionality of associations between parent mental health, family processes, and adolescent outcomes. The current study findings may likely also represent the role adolescent characteristics have in influencing family-level processes and parent mental health and behavior. It is highly likely that a dynamic interplay exists between these variables (Murphy et al., 2017).

Second, the use of self-report screening measures administered over the phone by research assistants may have introduced higher risk of social-desirability bias. This effect may have been observed with the reporting of parenting practices, with scores appearing significantly above average, potentially skewing the observed strength and significance of their association with adolescent mental health outcomes.

Third, the under-representation of fathers in the overall parent sample may not have provided sufficient statistical power to detect small effects, and precluded mediation analysis, limiting the study's capacity to provide insight on paternal-specific associations.

Additionally, the sample was predominantly composed of Syrian refugee families, and adolescents' inclusion criteria required participants to present with relatively elevated levels of mental health difficulties. Parents also presented with elevated levels of distress. Therefore, the associations found may be specific to populations exposed to high levels of conflict and adversity with higher incidence of

psychopathology and may not generalize to lower-risk groups. The restricted variability in scores for the different variables for which associations were examined may have attenuated observed relationships. Nevertheless, the fact that significant associations were identified despite this restricted variability may suggest that these relationships are robust within high-risk populations.

Finally, the use of secondary data restricted the selection of variables and measurement tools available for the current study. This limitation was particularly salient in the measurement of parent mental health, which focused primarily on internalizing symptoms. While this dimension of parent mental health is highly relevant to the current study's aims, other potentially relevant dimensions of parent psychological functioning were not captured, such as externalizing behaviors, which may also play a meaningful role in shaping parenting practices, family functioning, and adolescent mental health outcomes. Similarly, the assessment of adolescents' exposure to potentially traumatic and adverse events captured a cumulative score without segregation by trauma type. As a result, the analyses could not account for potentially distinct effects associated with different types of trauma exposure (e.g. war-related trauma vs. familial trauma) on adolescent mental health outcomes or family processes.

Future research would benefit from longitudinal designs in order to assess directionality and potential causal pathways linking parent and child mental health trajectories with family systemic processes in conflict-affected populations. Incorporating multi-informant ratings of the same variable relating to the same family member can help reduce the influence of social desirability bias on results. In this study, this was only done for family functioning. Barriers to father engagement in such

research initiatives should be identified early on in the process of research design. While dedicated resources may be required to promote fathers' engagement and address barriers to participation, such investment is warranted to advance understanding in an area that remains relatively under-researched within child and family mental health research, especially in conflict-affected populations. It may also be informative to expand the scope of parent mental health domains assessed to include externalizing behaviors, as it may facilitate a more nuanced understanding of how different dimensions of parent functioning may distinctly relate to parenting practices, family functioning, and adolescent mental health outcomes. Furthermore, selection of measurement tools may focus on prioritizing those that allow for differentiation across subdomains of key constructs to enhance the specificity and interpretability of findings. The recruitment of a larger and more diverse sample in terms of nationality and psychological profiles would also allow comparative analysis between sub-groups, facilitating the evaluation of the generalizability of findings and the identification of potentially group-specific patterns in associations.

Despite these limitations, the study has several strengths. Limited research exists on the association between parent mental health and child adjustment in humanitarian settings (Meyer et al., 2017). Moreover, existing research in conflict-affected populations has disproportionately examined the impact of parental traumatic stress on family systemic processes, particularly parenting behaviors, with relatively limited attention given to the influence of other forms of parent psychological distress on family-level processes (Sim et al., 2018). Furthermore, research examining the mechanisms influencing the mental health of conflict-exposed children, such as changes in parenting practices, enhances understanding of the developmental trajectories of

children in situations of heightened risk and can inform interventions (Eltanamly et al., 2021).

Therefore, the current study's findings contribute to filling an important gap in the literature with its focus on overall parent psychological distress in the examination of the association between parent and adolescent mental health through an ecological and family systemic lens specifically in a conflict-affected sample. Furthermore, there are no other known studies on conflict-affected populations that specifically examine family functioning as a mediator of this association. The current study also produced disaggregated data by parent gender, contributing specific insights into father-child dynamics, which are generally lacking in the literature.

The findings of this study have useful implications for intervention design as they suggest that the family context is highly relevant in understanding adolescent mental health needs in conflict-affected populations. More specifically, the findings provide preliminary evidence that family functioning and parenting practices may be important pathways in the transmission of wider socioecological risks onto parent and adolescent mental health, and therefore potentially meaningful areas of focus for intervention efforts. However, considering the cross-sectional nature of the current study, conclusions regarding causal pathways and mechanisms of change cannot be made.

Despite the lack of causal mechanisms that can be inferred from the findings, they may still be meaningfully interpreted within the context of broader intervention research implicating the role of family and parenting processes in shaping child mental health in conflict-affected populations. Particularly, the present findings are broadly consistent with the rationale informing parent-focused and family-based interventions.

Parent and family-focused interventions appear particularly effective due to their ability to improve caregivers' capacity to meet children's needs and in enhancing family relationships which in turn promote child well-being and facilitate the prevention and treatment of psychopathology in conflict-affected children (Bosqui & Marshoud, 2018). Considering that family-based interventions often address multiple processes at both dyadic and broader family levels of the child's social ecology and are effective in achieving a wide range of positive outcomes (Bosqui et al., 2024), research examining these underlying relational processes at play may help support their value and further inform their design and implementation.

Furthermore, in considering the likely circularity and bi-directionality in associations found, efforts that target family functioning and parenting practices may not only improve adolescent mental health but may likely also improve parent adjustment (see Theory of Change Diagram in Bosqui et al., In Press). In turn, improvements in parent mental health may further support adolescent outcomes, considering the direct associations identified in this study. If the observed associations identified between parenting practices and adolescent mental health in this study reflect true underlying relationships, this may indicate that interventions narrowly focused on improving parenting behaviors only may be less effective than approaches targeting broader family functioning, within which behavioral components focused on improving parenting practices can be embedded.

The sensivity analysis conducted exploring whether parent mental health predicted specific domains of adolescent mental health lends potentially useful preliminary insights to systemically-informed intervention research. By demonstrating associations between parent and adolescent mental health may vary according to

parental role as well as specific domains of child psychological functioning, these findings highlight the potential value of more nunaced explorations in examining areas of child mental health that may be differentially shaped by systemic factors and potentially also more responsive to family-systemic interventions. For example, in the original intervention study from which the current study derived its data (Bosqui et al., In press), the Sawa Aqwa family-focused intervention did not appear to significantly improve overall adolescent mental health but was effective in improving adolescent and caregiver well-being as well as improving caregiver distress, family functioning and parenting. While several plausible interpretations of these findings include potential delayed intervention effects, or contextual conditions influencing effectiveness of the intervention, the findings from the sensitivity analysis in the current study suggest that additional insights may be gained by examining intervention effects accross specific domains of adolescent mental health.

The consistent emergence of exposure to potentially traumatic events and adversity as significant predictors of adolescent mental health even while considering the contributions of parent mental health and family relational processes has important practical implications for policy in resource allocation and intervention design. Consistent with ecological models of distress in conflict-affected populations, these findings highlight the importance of recognizing that psychological distress in conflict affected populations is largely shaped by the chronic social and material conditions in which individuals and families continue to live, beyond the impact of direct exposure to conflict-related violence (Miller & Rasmussen, 2010, 2017). Therefore, the significant impact of exposure to trauma, adversity and daily stressors must be accounted for in humanitarian programming as an integrated component of a comprehensive mental

health response. Systemically-informed interventions seeking to support child and broader family mental health in conflict-affected populations may benefit from seeking to address basic material, social and protection needs as a pre-requisite to mental health service provision particularly given the potential for ongoing stressors to chronically tax coping resources and undermine psychological wellbeing over time (Miller & Rasmussen, 2010). Multisectorial integrated services that aim to address the impact of chronic stressors can serve to safeguard and maximize intervention efficacy and promote long-term impact.

In conclusion, findings underscore the importance of adopting a systemic and ecological lens to examine the processes through which the effects of contextual risk factors and structural inequalities are transmitted trans-generationally in conflict-affected populations, ultimately shaping the mental health and well-being of children and adolescents. Such knowledge is critical to effective prevention and intervention efforts to preserve and promote child well-being in contexts of chronic adversity. While individual-level interventions are valuable, they may be insufficient in isolation to address the complex influences that exist within the broader social ecology that impact child and adolescent mental health (Brown et al., 2024b). In contexts of adversity, where resources are scarce, and human stakes high, it appears critical to strengthen the integration of family systemic processes within humanitarian mental health programming in order to maximize the effectiveness, relevance and long-term impact of interventions aimed at improving the lives of conflict-affected children.

Particularly relevant to the context of Lebanon at the time of writing of this study is the evidence pointing at the importance of strengthening family relationship

specifically in times of active conflict to protect and promote the well-being of children (Bosqui & Marshoud, 2018). As Lebanon continues to face active conflict and violence, it is absolutely critical to provide children with scalable, effective and evidence-based interventions. In this way, the findings of this study are timely, and also serve as a call to action for resource mobilization towards implementing family-based interventions as part of emergency response efforts to protect and support the children of Lebanon.

APPENDIX A

THE SYSTEMATIC CLINICAL OUTCOME AND ROUTINE EVALUATION INDEX

Table 11 The Systemic Clinical Outcome and Routine Evaluation Index (SCORE; Stratton et al., 2014)

Describing your family Date.....

We would like you to tell us about how you see your family at the moment. So we are asking for YOUR view of your family.

When people say 'your family' they often mean the people who live in your house. **But we want you to choose who you want to count as the family you are going to describe.**

For each item, make your choice by putting ☑ in just one of the boxes numbered 1 to 5.
If a statement was "We are always fighting each other" and you felt this was not especially true of your family, you would put a tick in box 4 for "Describes us: not well".

			✓	

Do not think for too long about any question, but do try to tick one of the boxes for each question.

For each line, would you say **this describes our family**:	1. Describes us: Very well	2. Describes us: Well	3. Describes us: Partly	4. Describes us: Not well	5. Describes us: Not at all
1) In my family we talk to each other about things which matter to us					
2) People often don't tell each other the truth in my family					
3) Each of us gets listened to in our family					
4) It feels risky to disagree in our family					
5) We find it hard to deal with everyday problems					
6) We trust each other					
7) It feels miserable in our family					
8) When people in my family get angry they ignore each other on purpose					
9) We seem to go from one crisis to another in my family					
10) When one of us is upset they get looked after within the family					
11) Things always seem to go wrong for my family					
12) People in the family are nasty to each other					
13) People in my family interfere too much in each other's lives					
14) In my family we blame each other when things go wrong					
15) We are good at finding new ways to deal with things that are difficult					
	1.	2.	3.	4.	5.

APPENDIX B

BRIEF PARENTING QUESTIONNAIRE

Table 12 Brief Parenting Questionnaire (BPQ; Miller et al., 2025)

Instructions	**The following items ask about your experience as a mother/father within the last WEEK. There are no right or wrong answers, and for each question, you can answer "Rarely, Sometimes, Often, I Don't Know" or you can also choose not to answer if you don't want to. Please answer honestly, take your time, and let me know if anything is unclear.**	Rarely (1)	Sometimes (2)	Often (3)
Item 1	When I see my child, I feel happy			
Item 2	I spend time playing or talking with my child			
Item 3	I am interested to play or talk with my child			
Item 4	I hug and kiss my child			
Item 5	When my child wants my attention, I tell them not to bother me			
Item 6	When my child wants my attention, I show a lot of interest			
Item 7	I do things that make my child feel that I love him/her			
Item 8	I can make my child feel better if he is sad			
Item 9	I can make my child feel better if he is afraid			
Item 10	I ask my child what he/she is thinking or feeling			
Item 11	I ask my child about what he/she is doing (e.g. what he/she is playing with/drawing/singing; about his day; about what is happening in school; about his friends, etc.)			
Item 12	I enjoy spending time with my child			
Item 13	I feel close to my child			
Item 14	When I interact with my child, it is in a friendly or gentle way			
Item 15	When I interact with my child, it is in a harsh or angry way			
Item 16	When my child behaves badly, I respond calmly			
Item 17	When my child behaves badly, I speak to them harshly or shout at them			
Item 18	When my child behaves badly, I hit him/her			
Item 19	I threaten my child in ways that frighten them			
Item 20	When my child annoys me (talking too much, whining), I hit him/her			
Item 21	When my child behaves well, I praise him/her			
Item 22	When my child tries to do something but fails, I praise them for their effort			
Item 23	When my child does not do what I ask him/her to do, I am able to respond without losing my temper			
Item 24	When my child misbehaves, I'm able to use consequences that match the severity of the misbehaviour.			

APPENDIX C

THE KESSLER PSYCHOLOGICAL DISTRESS SCALE

Table 13 The Kessler Psychological Distress Scale (K6; Kessler et al., 2002)

The following questions ask about how you have been feeling during the **past 30 days**. For each question, please circle the number that best describes how often you had this feeling.

Q1. During the past 30 days, about how often did you feel …	**All of the time**	**Most of the time**	**Some of the time**	**A little of the time**	**None of the time**
a. …nervous?	**1**	**2**	**3**	**4**	**5**
b. …hopeless?	**1**	**2**	**3**	**4**	**5**
c. …restless or fidgety?	**1**	**2**	**3**	**4**	**5**
d. …so depressed that nothing could cheer you up?	**1**	**2**	**3**	**4**	**5**
e. …that everything was an effort?	**1**	**2**	**3**	**4**	**5**
f. …worthless?	**1**	**2**	**3**	**4**	**5**

APPENDIX D

THE PEDIATRIC SYMPTOM CHECKLIST 35

Table 14 The Pediatric Symptom Checklist 35 adolescent report (PSC-35; Jellinek et al., 1999)

Pediatric Symptom Checklist—Youth Report (Y-PSC)

Please mark under the heading that best fits you:

		Never	Sometimes	Often
1. Complain of aches or pains	1	_____	_____	_____
2. Spend more time alone	2	_____	_____	_____
3. Tire easily, little energy	3	_____	_____	_____
4. Fidgety, unable to sit still	4	_____	_____	_____
5. Have trouble with teacher	5	_____	_____	_____
6. Less interested in school	6	_____	_____	_____
7. Act as if driven by motor	7	_____	_____	_____
8. Daydream too much	8	_____	_____	_____
9. Distract easily	9	_____	_____	_____
10. Are afraid of new situations	10	_____	_____	_____
11. Feel sad, unhappy	11	_____	_____	_____
12. Are irritable, angry	12	_____	_____	_____
13. Feel hopeless	13	_____	_____	_____
14. Have trouble concentrating	14	_____	_____	_____
15. Less interested in friends	15	_____	_____	_____
16. Fight with other children	16	_____	_____	_____
17. Absent from school	17	_____	_____	_____
18. School grades dropping	18	_____	_____	_____
19. Down on yourself	19	_____	_____	_____
20. Visit doctor with doctor finding nothing wrong	20	_____	_____	_____
21. Have trouble sleeping	21	_____	_____	_____
22. Worry a lot	22	_____	_____	_____
23. Want to be with parent more than before	23	_____	_____	_____
24. Feel that you are bad	24	_____	_____	_____
25. Take unnecessary risks	25	_____	_____	_____
26. Get hurt frequently	26	_____	_____	_____
27. Seem to be having less fun	27	_____	_____	_____
28. Act younger than children your age	28	_____	_____	_____
29. Do not listen to rules	29	_____	_____	_____
30. Do not show feelings	30	_____	_____	_____
31. Do not understand other people's feelings	31	_____	_____	_____
32. Tease others	32	_____	_____	_____
33. Blame others for your troubles	33	_____	_____	_____
34. Take things that do not belong to you	34	_____	_____	_____
35. Refuse to share	35	_____	_____	_____

APPENDIX E

THE PEDIATRIC SYMPTOM CHECKLIST 17 YOUTH REPORT

Table 15 The Pediatric Symptom Checklist 17 Youth Report (PSC-17; Murphy et al., 2016)

Please mark under the heading that best fits you:		NEVER	SOMETIMES	OFTEN
◆ Fidgety, unable to sit still	◆	0	1	2
❇ Feel sad, unhappy	❇	0	1	2
◆ Daydream too much	◆	0	1	2
❑ Refuse to share	❑	0	1	2
❑ Do not understand other people's feelings	❑	0	1	2
❇ Feel hopeless	❇	0	1	2
◆ Have trouble concentrating	◆	0	1	2
❑ Fight with other children	❑	0	1	2
❇ Down on yourself	❇	0	1	2
❑ Blame others for your troubles	❑	0	1	2
❇ Seem to be having less fun	❇	0	1	2
❑ Do not listen to rules	❑	0	1	2
◆ Act as if driven by a motor	◆	0	1	2
❑ Tease others	❑	0	1	2
❇ Worry a lot	❇	0	1	2
❑ Take things that do not belong to you	❑	0	1	2
◆ Distract easily	◆	0	1	2

APPENDIX F

ADVERSE AND POTENTIALLY TRAUMATIC EVENTS MEASURE

Table 16 Adverse Events Measure (Bosqui et al, In Press)

Instruction: We would like to ask you about [INDEX ADOLESCENT NAME] past history. This information will be used to help us understand your child's life experiences and to know what kinds of experiences the Sawa Aqwa Family Program is helpful for. However, you may find some questions upsetting. If so, please feel free not to answer. This will certainly not affect your child's access to services. The answer to the questions will be kept confidential. I will not ask your child these questions nor will we share your answers with them. The only time I need to disclose the answers is if there is a threat to your child's safety- then I have a duty of care to report this to appropriate services. I need to remind you that we cannot provide any additional services based on your answers.		
Mark Yes or No	**Yes**	**No**
Lived in a refugee camp or settlement		
Lived in a war zone		
Been in danger during the flight (for example sea, boat, border)		
Serious physical injury		
Life-threatening illness		
Exposure to toxic substance (for example, dangerous chemicals)		
Serious accidents or explosion (for example fire, industrial accidents, farming accidents, car crashes, stray bullets)		
Forced separation from family member		
Forced to hide		
Witness rape or sexual abuse of another person		
Witnessed physical assault towards another person (for example someone being mugged, shot, stabbed or held at gunpoint)		
Witnessing killing/murder of another person		
Disappearance or kidnapping of family member or friend		
Serious physical injury of family member		
A family member or friend has been murdered or died due to violence or suicide		
Seeing a dead body (besides at a funeral)		
Having been kidnapped or experienced an attempted kidnap		

Physical assault by any other person (for example being physically attacked, mugged, shot, stabbed or held at gunpoint, such as on the street, on the way to/at school or work)		
Sexual assault (rape, attempted rape, made to perform or witness any type of sexual act through force, threat of harm, intimidation or bribery, such as on the street, on the way to school or work)		
Another situation that was very frightening or in which your child may have felt their life was in danger.		
Chronic illness		
In the last month: Chronic illness		
Ill health without access to medical care (including unaffordable/low quality healthcare, for example unaffordable vaccines for children or essential surgeries/medications)		
In the last month: Ill health without access to medical care (including unaffordable/low quality healthcare, for example unaffordable vaccines for children or essential surgeries/medications)		
Use of dangerous machinery in the workplace		
In the last month: Use of dangerous machinery in the workplace		
Lack of any shelter		
In the last month: Lack of any shelter		
Suffering from inadequate food or water		
In the last month: Suffering from inadequate food or water		
Difficult working conditions (for example works many hours with very little pay, forced to carry heavy things, threatened with salary deduction)		
In the last month: Difficult working conditions (for example works many hours with very little pay, forced to carry heavy things, threatened with salary deduction)		
Forced to leave your home due to eviction, threat, anything else		
In the last month: Forced to leave your home due to eviction, threat, anything else		
Poor/unsafe housing conditions (for example poor infrastructure, flooding, unsafe power sockets, water leakages, humidity/rot/mold, mosquito/rat infestation)		
In the last month: Poor/unsafe housing conditions (for example poor infrastructure, flooding, unsafe power sockets, water leakages, humidity/rot/mold, mosquito/rat infestation)		
Witnessing physical violence between family members (for example being slapped, beaten, punched, hit)		
In the last month: Witnessing physical violence between family members (for example being slapped, beaten, punched, hit)		
Serious chronic illness of family member		
In the last month: Serious chronic illness of family member		

Physical violence by a family member (for example being hit, punched, beaten)		
In the last month: Physical violence by a family member (for example being hit, punched, beaten)		
Sexual harassment (pestering, catcalling, such as on the street, on the way to/at school or work)		
In the last month: Sexual harassment (pestering, catcalling, such as on the street, on the way to/at school or work)		
Being shouted at, insulted or bullied by a family member (for example frequent name calling, threats, yelling or screaming, or manipulation)		
In the last month: Being shouted at, insulted or bullied by a family member (for example frequent name calling, threats, yelling or screaming, or manipulation)		
Being shouted at, insulted or bullied by any other person (for example frequent name calling, threats, yelling or screaming, or manipulation or discriminatory/degrading remarks, spat at)		
In the last month: Being shouted at, insulted or bullied by any other person (for example frequent name calling, threats, yelling or screaming, or manipulation or discriminatory/degrading remarks, spat at)		
Parental divorce or separation		
In the last month: Parental divorce or separation		
Social isolation (for example, little contact with friends, family, neighbors, community)		
In the last month: Social isolation (for example, little contact with friends, family, neighbors, community)		

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