Caregiver characteristics and behaviors: quantitative associations with child depression amongst refugees in Uganda

Sarah R. Meyer[1*], Neema Mosha[1,2], Rosco Kasujja[3], Sarah Namukwaya[4], Nawaraj Upadhaya[5], Eva Smallegange[4]

1 Institute for Medical Information Processing, Biometry, and Epidemiology, Ludwig-Maximilians-Universität München, Elisabeth-Winterhalter-Weg 6, 81377, München, Germany
2 Mwanza Intervention Trials Unit, PO Box 11936, Mwanza, Tanzania.
3 School of Psychology, Makerere University College of Humanities & Social Sciences (CHUSS), Uganda
4 WarChild Holland, Amsterdam, Netherlands
5 HealthRight International, Kathmandu, Nepal

*Corresponding author: sarah.r.meyer@gmail.com

Abstract:

For refugee children there are a number of risk factors for poor mental health and psychosocial well-being, many of them exacerbated for those refugee children living in low-resource settings. There is some evidence that caregiver warmth, parenting self-efficacy and positive relationships between caregivers and children can act as protective factors against poor mental health outcomes for children and adolescents. This study sought to assess if caregiver-level

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factors (parental warmth and affection, positive child-caregiver interaction and parenting self-efficacy) are protective for symptoms of child depression. To address these questions, a quantitative survey was implemented (n=501) in Imvepi refugee settlement in Uganda. Results indicated bivariate associations between several caregiver-level factors and child depression. However, in multivariate models, which included measures of economic stress, both parental warmth and affection and child-caregiver interaction were no longer significantly associated with child-reported depression. Parenting self-efficacy was found to be significantly associated with lower child-reported depression. These findings indicate the need to examine and explore how or if caregiver-level factors, such as warmth and parenting self-efficacy, as well as child-caregiver relationships overall, operate in the context of chronic stress. Whereas caregiver-level factors are potentially protective against poor mental health for refugee children, contextual factors, such as poverty and livelihood opportunities, may constrain the positive impacts of parenting.

Impact statement:

Refugee children globally experience a range of risk factors for poor mental health and psychosocial well-being. Aspects of their relationships with caregivers, including caregiver warmth, parenting self-efficacy and positive relationships between caregivers and children, may help to reduce refugee children's mental health challenges. We conducted a survey of caregivers and children in Imvepi refugee settlement in Uganda, exploring whether aspects of the caregiver-child relationship were associated with lower levels of child depression. When including economic stress in the statistical models, parental warmth and child-caregiver

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interaction are not associated with lower child depression, indicating that economic factors,

such as poverty and livelihood opportunities are highly influential on children's well-being and

may block the important impact of positive parenting in situations of chronic stress.

Introduction

The current scale of displacement of children globally is unprecedented. The United Nations High Commission for Refugees (UNHCR) reports that of the 108.4 million forcibly displaced persons in 2023, 43.3 million were children (UNHCR, 2023). Between 2018 and 2022, an average of 385,000 children were born as refugees annually (UNHCR, 2023). More than three-quarters of refugees globally are hosted in low and middle-income country (LMIC) settings, often in refugee camps. Refugee camps generate a range of potential threats to refugee children's physical and mental well-being (Vossoughi et al., 2016). Children in refugee camps have often experienced or witnessed traumatic events during flight, and subsequent changes in family structure, social support and educational opportunities in refugee camps in LMICs can also produce considerable stress and poor mental health. A systematic review of risk and protective factors amongst refugee children in LMICs found that exposure to premigration violence, female sex (for internalizing and emotional problems), male sex (for externalizing and behavioral problems), settlement in a refugee camp, and internal displacement were identified as risk factors for poor child mental health (Reed et al., 2012). A more recent systematic review indicates that evidence of risk factors for poor mental health in LMICs remains sparse, but that exposure to war-related trauma, parental mental health problems and poor parenting are risk factors for poor mental health of refugee children (Scharpf et al., 2021). Empirical evidence indicates that the mental health of refugee children is inextricably connected to family functioning and wellbeing, which is directly impacted by displacement-related stressors in specific realms of family life (Arenliu et al., 2020),

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including changes in family roles and obligations and changes in family relationships with other family members (Weine et al., 2004).

Research has identified several protective factors that may be protective against children's poor mental health, even in contexts of ongoing stressors (Betancourt & Khan, 2008). Family-level dynamics, including strong caregiver-child interactions and attachment relationships, and warm and supportive parenting practices, have been found to be associated with improved mental health amongst refugee children affected by conflict and violence (Catani et al., 2009; Fayyad et al., 2017). Parenting practices have been identified as playing "a crucial role for children's psychological wellbeing in a war context" (Catani, 2018). A systematic review of resilience and mental health of children living in LMIC settings affected by armed conflict identified several studies that indicated family-level predictors, such as parental monitoring and support, as protective against poor mental health outcomes or promotive of positive psychosocial wellbeing (Tol et al., 2013). The role of "engaged, responsive and stable parenting" in influencing children's mental health in contexts characterized by extreme violence, instability and deprivation is increasingly the focus of research and intervention in humanitarian settings (El-Khani et al., 2021).

Some evidence in humanitarian contexts in LMICs on how caregiver mental health influences parenting practices exists, while evidence concerning linkages between parenting practices and children's mental health outcomes are even more sparse. Evidence focusing on caregiver mental

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health and parenting practices indicates that poor mental health amongst caregivers is associated with significantly poorer parenting practices. For example, Meinhart and colleagues' study in Uganda found that lower caregiver distress was significantly associated with lower use of parenting behaviors characterized by undifferentiated rejection (Meinhart et al., 2023). The majority of existing evidence on associations between parenting practices and child mental health in refugee contexts derives from intervention studies. A series of interventions developed to improve refugee caregiver mental health – including, for example, the Caregiver Support Intervention – emphasize the role of "compromised parenting" in causing psychosocial distress and poor mental health amongst children in refugee contexts (Miller et al., 2023; Miller et al., 2020). Miller and colleagues indicate that caregivers' behaviors and practices can protect against the deleterious impacts of violence that can characterize children's experiences in refugee contexts, "by providing a supportive and structured home environment to allay the fear, sadness, and uncertainty engendered by violence and displacement" (Miller et al., 2020). Recent evaluations of Strong Families, a parenting skills intervention implemented in several humanitarian contexts globally, indicate that an intervention focused on improving caregiver self-regulation, relationship with and responses to children, and parenting self-efficacy, can improve children's psychosocial well-being (El-Khani et al., 2021; Haar et al., 2020; Haar et al., 2021). Parenting practices have also been identified as a moderator of associations between experience of traumatic events and children's mental health, with some studies indicating that positive parenting practices can ameliorate the impact of traumatic events on children's well-being (Slone & Shoshani, 2017). In addition, evidence on associations between caregiver mental health and

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child mental health in humanitarian contexts indicates a potential pathway between poor caregiver mental health, compromised parenting practices, and adverse child mental health outcomes (Betancourt et al., 2015). Overall, there is limited evidence from humanitarian contexts in LMICs, that links parenting practices and behaviors to children's mental health outcomes.

Broader literature concerning the relationship between caregiver behaviors, relationships and beliefs – referred to in this study as caregiver characteristics and behaviors – has provided definitions of key concepts, as well as evidence connecting these factors to children's mental health outcomes. Rohner and Khaleque, who developed the widely utilized Parental Acceptance and Rejection Questionnaire, propose that parental warmth can be defined as the "quality of the affectional bond between parents and their children…and the physical, verbal and symbolic behaviors parents use to express these feelings" (Rohner & Khaleque, 2012). In a meta-analysis of children's perceptions of parental warmth and affection, and associations with their psychological adjustment, Khaleque found significant associations between parental warmth and children's psychological outcomes (Khaleque, 2013). Yap and Jorm's systematic review of parental factors associated with child depression, anxiety and internalizing behaviors found that lower levels of parental warmth were associated with higher internalizing outcomes (Yap & Jorm, 2015), and evidence also indicates that experience of parental warmth and affection in childhood predicts coping and well-being in adulthood (Moran et al., 2018). Parental self-efficacy (PSE) describes "a parent's belief in their ability to perform the parenting role successfully," (Wittkowski et al., 2017) and has been consistently found to be associated with improved

parental mental health, higher quality child-caregiver relationships, and positive mental health amongst children (Albanese et al., 2019). Jones and Prinz identify a range of potential pathways between PSE and child mental health, including that PSE impacts parental competence, and that parents with low PSE may find effective parenting more difficult in challenging contexts (Jones & Prinz, 2005). Some evidence has indicated that socio-economic factors, including income and household size, are significantly associated with PSE; structural factors may reduce caregivers' capacity for effective parenting and, subsequently, reduce PSE (Fang et al., 2021). Child-caregiver interactions form the basis of responsive caregiving, providing children with strong attachment to primary caregivers, and supporting healthy social, physical and emotional development (World Health Organization, 2004).

Uganda provides a unique and important context in which to investigate associations between caregiver characteristics and behaviors and child mental health. Uganda is the largest host country of refugees in Africa, with the majority of the 1.5 million refugees residing in Uganda originating from South Sudan and the Democratic Republic of Congo [DRC] and the vast majority residing in rural refugee settlements, primarily in North-West Uganda (UNHCR, 2023). Evidence from refugee settlements in Uganda indicates that refugee youth face a confluence of factors producing significant risks to mental health and psychosocial wellbeing, including sexual and gender-based violence, poverty, early and forced marriage, and lack of access to quality health services and educational opportunities (Logie et al., 2021; Logie et al., 2023; Loutet et al., 2022). A limited number of studies have explored risk and protective factors for adverse mental health outcomes amongst child refugees in Uganda, including anxiety and depression. A study

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conducted amongst female adolescent refugees in urban settlements in Uganda showed that having children during adolescence was a risk factor for depressive symptoms (Malama et al., 2023). Evidence from refugee settlements in Uganda indicates that adolescents who reported higher levels of violence experience was associated with elevated depression and anxiety (S. R. Meyer et al., 2017). In another analysis, a one unit increase in caregiver depression, assessed using the Hopkins Symptoms Checklist, was associated with triple the odds of high level of adolescent symptoms of depression (Sarah R Meyer et al., 2017).

To expand the evidence-base concerning caregiver characteristics and behaviors in refugee contexts, and specifically amongst refugees from the DRC and South Sudan in Uganda, we conducted a survey to address the research question: are caregiver-level factors (parental warmth and affection, parental self-efficacy and child-caregiver interaction) protective for symptoms of child depression? In addition, drawing on self-report measures of child depression from children and caregiver-reported child depression, we assessed whether these factors are consistently associated with child depression across both child and caregiver-report of child depression.

Methods:

PlayMatters is a multi-year initiative implemented by a consortium, led by International Rescue Committee, and including WarChild. The overall objectives of PlayMatters are to assess the impact of learning through play approaches, implemented within educational settings, on

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children's learning and well-being, in refugee contexts in Uganda, Tanzania and Ethiopia. The present study includes quantitative data collected as part of a formative study amongst refugees from South Sudan and the DRC in Imvepi refugee settlement, West-Nile, Uganda. The formative research focused on one aspect of the larger PlayMatters project, namely, child-caregiver relationships, to identify how household- and caregiver factors influence child well-being in this context. This survey was implemented following a qualitative phase of research, which included in-depth interviews, focus group discussions, household observation and a Photovoice activity. The qualitative research phase aimed to yield insight into child and caregiver perceptions of play, child-caregiver interactions and barriers to playful interactions at home. The qualitative research informed instrument development, including the selection and development of scales specifically for this survey.

Sample and sampling

A total of 501 child-caregiver dyads were selected to participate in the survey. Inclusion criteria for a household were: a child aged between 10-14 years old residing in the household and that household members are refugees from either the DRC or South Sudan (or born in Uganda, but originating from the DRC or South Sudan). The identification of eligible households for the study followed a systematic approach. Using a random skipping pattern, each Research Assistant moved in either direction of the village, and every sixth household was screened for eligibility and inclusion. Each Research Assistant was assigned a demarcated block area to ensure comprehensive coverage, guided by community leaders who delineated block boundaries. As per

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the household recruitment SOP, households with a child aged 10-14 years old were identified. In households with more than one eligible child, the child was randomly selected through drawing numbers out of a hat. The child then selected the adult in the household who they considered their primary caregiver. Participation in the study implied verbal consent from the head of the household to allow interaction with household members during the screening process by the research team, assent from the index child, and informed consent from the identified primary caregiver. A total of 501 households were included in the study: 401 households for the South Sudanese and 100 for the Congolese community, with 1002 interview conducted; one primary caregiver and one child per household. In each household if more than one eligible child between ages 10-14 resided in the household, one child was randomly selected.

Data collection

Data collectors participated in a 5 day intensive training focused on equipping them with knowledge and skills relevant for implementing this study. The training agenda covered different sessions, which research ethics, interview skills, and principles for survey data collection and techniques; and then role-play to build understanding of the survey instruments and practice essential Commcare skills for survey administration.

Prior to pilot data collection, cognitive testing of the study tools was done whereby ten child interviews and nine caregiver interviews were conducted. The survey was translated following a multi-step translation process that consisted of 1) translation; 2) blind back-translation into the

relevant languages: Alur, Bari, Juba Arabic and Congolese Swahili; 3) verification of the translations by language experts coming from the communities where the study was being implemented. Before pilot data collection, cognitive testing of the study tools was conducted following a three-day training for four enumerators, each assigned to a specific study language. Cognitive interviews were conducted in 10 households, and data were analyzed to refine and improve the caregiver and child survey instruments.

Pilot data collection was done in selected blocks, and a total of 100 households were recruited 100 caregivers and 100 children were interviewed. The survey was translated following a multi-step translation process that consisted of 1) translation; 2) blind back-translation into the relevant languages: Alur, Bari, Juba Arabic and Congolese Swahili; 3) verification of the translations by language experts coming from the communities where the study was being implemented.

Survey instrument

The selected measurement tool to assess the outcome, child depression, was assessed using both child and caregiver-report of the Moods and Feelings Questionnaire – Short Form (MFQ-SF). The MFQ-SF consists of 13 items assessing depressive symptoms, asking the child or caregiver respondent the extent to which certain statements were true in the past two weeks, with response options of "Not true," "Sometimes true," and "True," scored as 0, 1 and 2 respectively. Possible scores range from 0-26 (Cronbach's alpha of child report from this dataset=0.83; Cronbach's alpha to caregiver report from this dataset=0.85). Child depressive symptoms were

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defined as a binary variable: no depression if the MFQ-SF score was between 0 and 11 and the presence of depressive symptoms if the score was above or equal to 12. The same cut-off points were used for the child's and caregiver's reports. This cut-off was selected based on existing literature and recommendations (Duke Psychiatry and Behavioral Sciences, 2024), however, the instrument has not been validated in Uganda or with this population. Conditions required to be able to do linear regression were not met, logistic regression analysis was the best fit for the analysis, with the caveat that a full validity study prior to selection of a cut-off would strengthen the analysis and interpretation.

Exposure variables were parental self-efficacy (reported only by caregivers), parental warmth and acceptance and child-caregiver interactions both reported by children and caregivers. Parental warmth and acceptance was assessed via a sub-scale of the Parental Acceptance and Rejection Questionnaire [PARQ], which has been validated in many non-Western contexts globally (Khaleque & Rohner, 2002) and has been utilized in a similar context amongst caregivers in a refugee settlement in Western Uganda (Meinhart et al., 2023). The PARQ assesses children's perceptions of parental warmth and acceptance using eight items such as "My caregiver says nice things about me" or "My caregiver is really interested in what I do," with response categories of "Almost always true," "Sometimes true," "Rarely true" and "Almost never true." Caregiver-report of their own parental warmth and affection towards the selected child included the same items worded to reflect the caregivers' behaviors, such as "I say nice things about my child" and "I am really interested in what my child does", with the same response categories (child-report

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Cronbach's alpha from this dataset=0.90; caregiver-report Cronbach's alpha from this dataset=0.74). Parenting self-efficacy was assessed via self-reporting from caregivers, using the efficacy sub-scale of the Parenting Sense of Competence scale, which has been validated in Uganda amongst HIV-positive mothers (Augustinavicius et al., 2020). The efficacy sub-scale consists of seven items, including statements such as "I feel I am able to take care of my child in the way that I feel is a good way to raise him/her" and "You honestly believe you have all the skills necessary to be a good caregiver to your child," with six possible response options, "Strongly disagree," "Disagree," "Somewhat disagree," "Somewhat agree," "Agree" and "Strongly agree" (Cronbach's alpha from this dataset=0.81). The child-caregiver interactions scale was developed for this study, based on qualitative data collected in an earlier phase of the formative study. The scale included items assessing frequency of child-caregiver interactions, reported by both children and caregivers, and including items assessing the frequency of activities conducted in the past week, such as "My child and I work together on preparing food for our household/family" and "I join my child in games and playful activities," with possible response options of "Very rarely (less than once a week)," "Rarely (a couple of times a week)," "Occasionally (at least four times a week)," "Frequently (at least once a day)," and "Very frequently (several times a day)" (child-report Cronbach's alpha from this dataset=0.78; caregiver-report Cronbach's alpha from this dataset=0.81). This instrument was developed for the purposes of this study, however, validation of the instrument beyond calculation of Cronbach's alpha was not possible. All items from the PARQ warmth and acceptance sub-scale,

the parenting self-efficacy measure and the child-caregiver interactions scale are listed in Supplementary File 1.

Household and individual-level covariates were assessed. Caregivers were asked to report on three household-level measures of financial stress and well-being. Financial stress was assessed using four items – being worried about their general financial situation, having to borrow money for food or rent, not seeing a doctor due to not having enough money, and children missing school because of lack of money for school supplies or uniforms – and asking about frequency of occurrence in the past month. Hunger was assessed using the Household Hunger Scale, which is widely used in LMICs, including humanitarian contexts, consisting of three items and three additional questions about frequency (Deitchler et al., 2011). Broader humanitarian needs were assessed using 12 selected items from the Humanitarian Emergency Settings Perceived Needs (HESPER) Scale, which was developed to assess physical, social and psychological needs of adults affected by humanitarian crises (Semrau et al., 2012). The measure includes items such as "Do you have a serious problem because you do not have enough, or good enough, clothes, shoes, bedding or blankets?" and "Do you have a serious problem because you do not have enough water that is safe for drinking or cooking?," and asks respondents to indicate if the specific problem is a serious problem or not a serious problem for them. Caregivers also reported individual-level socio-demographic variables - age, education level, number of years living in the refugee settlement, number of people and children in the household, and relationship with the child respondent within the child-caregiver dyad. Children reported individual-level socio-demographic variables - age, level of education, and physical limitations or difficulties with

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participation, which was assessed with a single binary question asking, "Do you have any physical limitations or difficulties that limit participation in your family or community?"

Data analysis

Data was transferred from Excel to STATA version 17 for analysis. Descriptive statistics were performed comparing depressive symptoms versus all explanatory variables. Frequency and proportions were calculated for categorical variables and assessed using the chi-square test. Binary logistic regression models were fitted to determine if the defined caregiver-level factors (parental warmth and affection, PSE and child-caregiver interaction) protect child depression symptoms. Independent models were fitted for child and caregiver-reports of child depression. Due to the collinearity of the caregiver factors, five adjusted logistic models were fitted: three for child report on child depression and two for child depression-caregiver report AND adjusted for other potential confounders that showed significant association in the univariate models. A p-value of <0.05 was used to assess the strength of the association. The goodness of fit for all the models was assessed using the Hosmer-Lemshow test and exploration of ROC curves.

Ethics

Informed consent and assent procedures for caregivers and their children were followed at the moment of recruitment. Participants were participating voluntarily and could opt out of the study at any time. All results are reported anonymously and are treated with confidentiality. Processes for adverse events were part of the study implementation and participants were informed about available complaints mechanisms.

The study received Institutional Review Board (IRB) approval from the Makerere University School of Health Sciences Research and Ethics Committee (MAKSHS-REC), under reference number MAKSHSREC 2023-620. Additionally, approval was granted by the Uganda National Council for Science and Technology (UNCST) under reference number SS1272ES.

Results

Table 1 displays the socio-demographic characteristics of the 501 caregiver-child dyads included in the study. The vast majority of caregivers were female (80.8%), and between 25-34 years old (32.7%) or 35-44 years old (30.1%). The most commonly reported level of education was any primary education (61.9%), followed by no formal education (19.0%). Half of the caregivers, 259 (51.7%) reported having lived in the settlement for more than five years. A little more than half the sample reported serious financial difficulties (53.1%), and almost three-quarters of the study population (74.1%) were categorized as facing moderate hunger, while 14.4% were categorized as reporting no hunger and 11.6% as reporting severe hunger. Over half the dyads reported that they were a biological parent of the child 261 (52.1%). There was an equal distribution of sex among children enrolled in the study, 50.3% female, with around a quarter (24.2%) aged 14. An even distribution of education level was observed for the children; the lowest was in P1 (17.8%), with their highest level of education 30.3% of children reported their highest level of education as P4 and above.

Table 2 displays bivariate associations between caregiver characteristics, socio-demographics, and child-reported depression. We observed a significant association between child-reported depression with child-report of the PARQ, parental report of child-caregiver interactions, parenting self-efficacy, years lived in the settlement, number of people in the household, number of children in the household, child-reported limitations and child-caregiver relationship. Table 3 displays bivariate associations between caregiver characteristics, socio-demographics, and caregiver-reported child depression, showing significant associations with child and caregiver-report of the PARQ, financial difficulties and HESPER.

Table 4 displays multivariate associations between caregiver behaviors and characteristics significant at the bivariate level and child-reported depression, controlling for the socio-demographic variables significantly associated with the outcome at the bivariate level. Model 1 assesses the multivariate association between parental warmth and affection and child-reported depression, indicating no significant association between parental warmth and affection and child-reported depression. Several socio-demographic and economic variables remain significant in the multivariate model. Some of these variables were protective against depression – for example, children in households who had been in the settlement more than 5 years were significantly less likely to report depression (aOR: 0.38, 95%CI: .17, .85), whereas other variables were significantly associated with elevated symptoms of depression, for example, children in households with high HESPER scores were almost four times as likely to

report higher depression symptoms (aOR: 3.79, 95% CI: 2.17, 6.61) compared to the ones with lower HESPER score.

Model 2 assesses the multivariate association between caregiver-report of frequency of child-caregiver interactions and child-reported depression; frequency of interactions was no longer significantly associated with child-reported depression. Several covariates were protective against higher depression symptoms (years lived in settlement, number of children in household, education level), while other variables were significantly associated with increased odds of child-reported depression. For example, higher HESPER score increases the odds of child-reported depression by four times (aOR: 4.12, 95% CI: 2.36, 7.14) compared to lower reported HESPER score. In Model 3, PSE and child-reported depression, results indicate that higher PSE is protective against child-reported depression (aOR: 0.51, 95% CI: .29, .90). In this model, other variables that are significantly associated with child-reported depression are the number of children in a household, financial difficulties, HESPER score, child-caregiver relationship, education level and child-reported limitations status. Across the three models assessing the child-reported depression outcome, HESPER, child-caregiver relationship and child-reported limitations were all consistently significantly associated with elevated odds of child-reported depression.

Table 5 displays caregiver behaviors and characteristics significant associated at the bivariate level with caregiver-reported child depression. Model 4 indicates that child-reported caregiver

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warmth and affection is not significantly associated with caregiver-reported child depression, when controlling for serious financial difficulties and HESPER score. Model 5 assesses caregiver-reported parental warmth and affection and caregiver-reported child depression, displaying significant associations between higher levels of warmth and affection and reduced odds of child depression, for example, high warmth and affection compared to low warmth and affection was associated with 80% reduced odds of caregiver-reported child depression (aOR: .20, 95% CI: .08, .49). No significant association were observed between caregiver-reported child depression and child-reported parental warmth and affection and caregiver-reported child depression. Both financial difficulties and HESPER score were also significantly associated with elevated odds of caregiver-reported child depression in both Models 4 and 5.

Discussion

Our study explored the association between caregiver characteristics and behaviors and child depression amongst refugees living in a settlement in Uganda. Existing evidence examining how or if parenting practices influence child mental health outcomes in humanitarian settings is sparse, yet understanding of these associations can inform development and implementation of additional research to understand pathways, as well as programming and policy to support caregiver parenting and behaviors to reduce adverse child mental health outcomes. Our study is unique in exploring a number of caregiver characteristics and behaviors – warmth and affection, caregiver-child interactions and parenting self-efficacy, as well as the inclusion of caregiver-child dyads. In addition, we assessed both child and caregiver-reported depression. Our main findings

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are firstly, both parental warmth and affection and child-caregiver interaction were no longer significantly associated with child-reported depression when socio-demographic and economic variables were included. Secondly, multivariate analyses indicated differences in associations between child and caregiver-reported variables, indicating the utility of including both child and caregiver-reported exposures and outcomes. This also suggests the need for more comprehensive measurement in future research, given existing evidence primarily includes report from either child or caregiver, and not both. Thirdly, economic factors were prominent in significant associations with child depression, for reporting higher levels of serious problems according to the HESPER nearly quadrupled the odds of child depression. Finally, parenting self-efficacy was found to be significantly associated with lower child-reported depression.

Multivariate model results indicate differential associations between caregiver and child-reported parental warmth and affection; parental warmth and affection is significantly associated with reduced child depression when parental warmth and affection is reported by the caregiver, but not by the child. Concordance between child and caregiver-reporting on these exposures and on depression is not currently explored in the literature on parenting and child mental health in LMICs. Research on concordance of child and parent-report on mental health outcomes indicates that high levels of concordance may be driven by low prevalence of mental health symptoms in population-based samples in high-income contexts (Gray et al., 2021); discordance between child and caregiver reporting on both exposures and outcomes may be higher in the context of this study, and therefore may influence results and interpretations. Our

findings show that, caregiver, but not child-reported parental warmth and affection, is protective in the case of the caregiver-reported depression. This may indicate that caregiver-reported behavior is subject to self-reporting bias, where caregivers perceive their behaviors in a more positive light compared to how their children experience it. Psychological literature has addressed discordance in child and caregiver reporting of child mental health, finding that such discordance can be due to contextual factors, in that some child behaviors occur when parents are not present, or informant characteristics, in that female caregivers may report more accurately than male caregivers about their children's mental health (Korelitz & Garber, 2016). Discordance in reporting on parenting behaviors indicates that this is due to parental tendency for providing socially desirable responses (Fung & Lau, 2010). In addition, in our study, across both child and caregiver-reported depression outcomes, child-reported parental warmth and affection is not a protective factor as was hypothesized and may be expected from the existing literature. This unexpected finding may actually shed light on issues of validity in the existing evidence-base, whereby caregiver self-report of their own warmth and affection is less reliable than that of children. Child-level reporting bias may also be present, and therefore research on methodological approaches to accurate measurement of children's mental health recommends inclusion of child as well as close adult-reporting, i.e. caregiver or teacher (Rescorla et al., 2012). This study indicates that a multi-informant approach to identifying mental health problems and associated factors in a refugee population in Uganda is feasible and effective, providing important insights into how results may be impacted by who is reporting. Further analyses of this dataset can explore whether or how child-caregiver relationship-quality influences concordance

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or discordance of reporting of child depression between caregivers and children (Maurizi et al., 2012).

The results of multivariate models also indicate a strong and consistent association between economic factors – higher reporting of perceptions of financial difficulties and reporting of more severe problems as assessed by the HESPER – and child depression, both child and caregiver reported. While examining the association between economic factors and child depression was not one of the objectives of the study, the strength of these specific findings indicate that while parenting factors may be important targets for intervention and support, the structural economic environment strongly impacts – likely both directly and indirectly – children's mental health. These findings confirm an extensive evidence base identifying pathways between economic stress, including food insecurity, lack of livelihood opportunities and financial strain, and poor mental health (Lund et al., 2018). The global refugee response is grossly under-funded, affecting provision of basic health and social services, food rations and adequate education in refugee camps globally. In our study, more than half of respondents reported having serious financial difficulties and 85% reported either severe or moderate hunger. While many humanitarian agencies support and implement programs to promote refugee self-reliance, particularly in situations of prolonged displacement (Slaughter, 2020), many refugees located in LMIC settings experience severe economic hardships, which affects their own and children's mental health. Interventions to improve child mental health in refugee settings must consider the economic context in which caregivers are parenting, which can constrain and shape parenting practices, as

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well as address vulnerabilities and structural factors, in order to effectively address primary predictors of mental health of child refugees.

Parenting self-efficacy was found to be significantly associated with reduced symptoms of child-reported depression. Parenting self-efficacy and its associations with child well-being outcomes is widely researched in high-income contexts, and a limited number of studies have examined parenting self-efficacy amongst refugees resettled in high-income countries (Boruszak-Kiziukiewicz & Kmita, 2020; Eltanamly, Leijten, van Roekel, Mouton, et al., 2023; Eltanamly, Leijten, van Roekel, & Overbeek, 2023). One study examined parenting-related measures in the context of Rohingya refugees residing in Malaysia, finding that caregiver emotional distress was associated with lower parenting self-efficacy (Shaw, Pillai, et al., 2021). A randomized controlled trial, conducted in the same context, found that a parenting intervention effectively strengthened parenting self-efficacy, while measures of positive discipline and parenting were not influenced by the intervention (Shaw, Ward, et al., 2021). While findings regarding parenting self-efficacy in refugee populations in LMIC contexts are sparse, our results indicate that interventions and approaches to understand and improve parenting self-efficacy may be effective in reducing poor child mental health. However, a systematic review of factors influencing parenting self-efficacy globally indicated that socio-cultural and contextual variables, including socio-economic status and family dysfunction, are predictors of parenting self-efficacy (Glatz et al., 2024) and another systematic review found that household income, perceived social support and parenting stress, amongst other factors, were associated with parenting self-efficacy

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(Fang et al., 2021). The findings from this study indicate that parenting self-efficacy may be an important target to improve caregiver and child mental health in refugee settings, however, structural influences that enable or hinder parenting self-efficacy must also be understood and accounted for.

These results should be interpreted in light of some limitations. The study employed a cross-sectional study design, and therefore child depression being the causal factor driving caregiver characteristics and behaviors cannot be ruled out. However, the recall periods of the different instruments – with a two week recall period for symptoms of depression, compared to a general recall period for the caregiver characteristics and behaviors – may reduce the likelihood of reverse causality. The child-caregiver interaction measure was developed specifically for this study, and while it was pilot tested, it did not undergo a full validity study. However, the measure did exhibit adequate Cronbach's alphas for both child and caregiver report. The PARQ, parenting self-efficacy measure and MFQ have been tested and validated in Uganda in similar contexts, and exhibited medium to high Cronbach's alphas, indicating good internal consistency of the included items. A significant limitation is interpretation of the results in light of use of a cut-off that was not validated in this population and context. Lack of resources for a full validity study to determine the appropriate cut-off of the MFQ outcome in this context entailed utilization of a cut-off recommended and utilized for similar populations and contexts.

Conclusion

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Parenting practices and behaviors have been identified as an important target for intervention to improve child well-being and mental health in humanitarian contexts. In this study conducted in a refugee setting in Uganda, analyses indicated that many of the protective factors hypothesized to be associated with child mental health were not significant when economic factors were taken into account. Significant associations were parenting self-efficacy and child-reported child depression and caregiver-reported parental warmth and affection, which was significantly associated with reduced caregiver-reported child depression. By assessing exposure and outcome measures by caregiver and child-report, variations in associations were identified that point to the importance of taking multiple measures and further exploration of why these differential associations exist.

Author contribution statement

SRM, ES, RK and NU led the conceptualization of the study and methodology and supervised study implementation and data quality. NM led data curation and formal analysis. SN supported project administration and supervision. SRM and ES were involved in manuscript writing and

development. NM, RK, SN and NU were involved in revision of the manuscript. All authors read and approved the final manuscript.

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Conflict of interest statement

All authors declare that they have no conflicts of interest.

Data availability statement

Data are available on request from the authors. Data that support the findings are available upon reasonable request from the corresponding author.

Ethics statement

The study received Institutional Review Board (IRB) approval from the Makerere University School of Health Sciences Research and Ethics Committee (MAKSHS-REC), under reference number MAKSHSREC 2023-620. Additionally, approval was granted by the Uganda National Council for Science and Technology (UNCST) under reference number SS1272ES.

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Table 1: Child and caregiver socio-demographics

Caregiver	n (%)
Sex	
Female	405 (80.8)
Male	96 (19.2)
Age	
18-24 Years	67 (13.4)
25-34 Years	164 (32.7)
35-44 Years	151 (30.1)
45+ Years	119 (23.8)
Highest education level	
Never attended school	95 (19.0)
Any primary	310 (61.9)
Completed Primary	29 (5.8)
Secondary or Higher	67 (13.4)
Years lived in this settlement	
Less than 2 Years	52 (10.4)
2-5 Years	190 (37.9)
5+ Years	259 (51.7)
Number of people in the household	
2-5	105 (21.0)
6-9	232 (46.3)
10+	164 (32.7)
No. of children in household	
1-3	103 (20.6)
4-6	251 (50.1)
7-9	112 (22.4)
10+	35 (7.0)
Financial difficulties	

No/ little financial difficulties	235 (46.9)
Serious financial difficulties	266 (53.1)
Hunger scale category	
No-Little Hunger	72 (14.4)
Moderate	371 (74.1)
Severe	58 (11.6)
	Mean (SD)
Household stressors (HESPER)	6.51 (2.12)
Child-caregiver relationship	
Biological parent	261 (52.1)
Biological relative	205 (40.9)
Other - foster care, etc	35 (7.0)
Child	
Sex	
Female	252 (50.3)
Male	249 (49.7)
Age	
10	110 (22.0)
11	55 (11.0)
12	117 (23.2)
13	98 (19.6)
14	121 (24.2)
Highest level of education	
P1	89 (17.8)
P2	116 (23.2)
P3	144 (28.7)
P4 and above	152 (30.3)
Child-reported limitations or difficulties participating	
No	412 (82.2)

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Yes	89 (17.8)

Table 2: Bivariate associations between caregiver factors (PARQ, parenting self-efficacy and child-caregiver interactions), caregiver socio-demographic factors and child-reported child depression

Variable	No depression n=410	Depression n=91	p-value
Parental warmth and affection (child-report)			
Low warmth and affection	164 (77.7%)	47 (22.3%)	**p=.039**
Moderate warmth and affection	165 (82.5%)	35 (17.5%)	
High warmth and affection	81 (90.0%)	9 (10.0%)	
Parental warmth and affection (parental-report)			
Low warmth and affection	52 (81.3%)	12 (18.8%)	p=.110
Moderate warmth and affection	242 (79.3%)	63 (20.7%)	
High warmth and affection	115 (87.8%)	16 (12.2%)	
Child-caregiver interaction (child-report)			
Low frequency of interaction	67 (82.7%)	14 (17.3%)	p=.200
Moderate frequency of interaction	257 (83.7%)	50 (16.3%)	
High frequency of interaction	86 (76.1%)	27 (23.9%)	
Child-caregiver interaction (parental-report)			
Low frequency of interaction	200 (86.6%)	31 (13.4%)	**p=.021**
Moderate frequency of interaction	156 (79.2%)	41 (20.8%)	
High frequency of interaction	53 (73.6%)	19 (26.4%)	
Parenting self-efficacy			

4

Poor self-efficacy	197 (76.7%)	60 (23.3%)	**p=.002**
High self-efficacy	212 (87.2%)	31 (12.8%)	
Financial difficulties			
No/ little financial difficulties	200 (85.1%)	35 (14.9%)	p=.071
Serious financial difficulties	209 (78.9%)	56 (21.1%)	
HESPER			
Low number of serious problems (0-7)	315 (86.8%)	48 (13.2)	**.000**
High number of serious problems (8-13)	94 (68.6%)	43 (31.4)	
Sex of caregiver			
Female	333 (82.4%)	71 (17.6%)	p=.460
Male	76 (79.2%)	20 (20.8%)	
Age of caregiver			
18-24 Years	56 (83.6%)	11 (16.4%)	p=.330
25-34 Years	126 (77.3%)	37 (22.7%)	
35-44 Years	128 (84.8%)	23 (15.2%)	
45+ Years	99 (83.2%)	20 (16.8%)	
Highest education level			
Never attended school	73 (76.8%)	22 (23.2%)	p=.200
Any primary	256 (82.8%)	53 (17.2%)	
Completed Primary	27 (93.1%)	2 (6.9%)	

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Secondary or Higher	53 (79.1%)	14 (20.9%)	
Years lived in this settlement			
Less than 2 Years	33 (63.5%)	19 (36.5%)	**p=.001**
2-5 Years	153 (81.0%)	36 (19.0%)	
5+ Years	223 (86.1%)	36 (13.9%)	
Number of people in the household			
2-5	74 (71.2%)	30 (28.8%)	**p=.005**
6-9	199 (85.8%)	33 (14.2%)	
10+	136 (82.9%)	28 (17.1%)	
No. of children in household			
1-3	73 (70.9%)	30 (29.1%)	**p=.008**
4-6	216 (86.4%)	34 (13.6%)	
7-9	92 (82.1%)	20 (17.9%)	
10+	28 (80.0%)	7 (20.0%)	
Hunger scale category			
No-Little Hunger	60 (83.3%)	12 (16.7%)	p=.450
Moderate	305 (82.4%)	65 (17.6%)	
Severe	44 (75.9%)	14 (24.1%)	
Child-reported limitations or difficulties participating			

6

Yes	350 (85.0%)	62 (15.0%)	**p=.000**
No	60 (67.4%)	29 (32.6%)	
Child-caregiver relationship			
Biological parent	226 (86.6%)	35 (13.4%)	**p=.006**
Biological relative	160 (78.0%)	45 (22.0%)	
Other - foster care, etc	24 (68.6%)	11 (31.4%)	

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Table 3: Bivariate associations between caregiver factors (PARQ, parenting self-efficacy and child-caregiver interactions), caregiver socio-demographics and caregiver-reported child depression

Variable	No depression n=423	Depression n=78	p-value
Parental warmth and affection (child-report)			
Low warmth and affection	170 (81.0%)	40 (19.0%)	**p=.045**
Moderate warmth and affection	170 (85.0%)	30 (15.0%)	
High warmth and affection	83 (92.2%)	7 (7.8%)	
Parental warmth and affection (parental-report)			
Low warmth and affection	47 (72.3%)	18 (27.7%)	**p=.003**
Moderate warmth and affection	257 (84.3%)	48 (15.7%)	
High warmth and affection	119 (90.8%)	12 (9.2%)	
Child-caregiver interaction (child-report)			
Low frequency of interaction	71 (87.7%)	10 (12.3%)	p=.590
Moderate frequency of interactions	259 (84.6%)	47 (15.4%)	
High frequency of interaction	93 (82.3%)	20 (17.7%)	
Child-caregiver interaction (parental-report)			
Low frequency of interaction	200 (86.6%)	31 (13.4%)	p=.190
Moderate frequency of interaction	160 (80.8%)	38 (19.2%)	
High frequency of interaction	63 (87.5%)	9 (12.5%)	

Parenting self-efficacy			
Poor self-efficacy	222 (86.4%)	35 (13.6%)	p=.220
High self-efficacy	201 (82.4%)	43 (17.6%)	
Financial difficulties			
No/ little financial difficulties	214 (91.1%)	21 (8.9%)	**p=.000**
Serious financial difficulties	209 (78.6%)	57 (21.4%)	
HESPER			
Low number of serious problems (0-7)	329 (90.6%)	34 (9.4%)	**p=<0.000001**
High number of serious problems (8-13)	94 (68.1%)	44 (31.9%)	
Sex of caregiver			
Female	340 (84.0%)	65 (16.0%)	p=.540
Male	83 (86.5%)	13 (13.5%)	
Age of caregiver			
18-24 Years	59 (88.1%)	8 (11.9%)	p=.073
25-34 Years	135 (82.3%)	29 (17.7%)	
35-44 Years	121 (80.1%)	30 (19.9%)	
45+ Years	108 (90.8%)	11 (9.2%)	
Highest education level			
Never attended school	81 (85.3%)	14 (14.7%)	
Any primary	257 (82.9%)	53 (17.1%)	

9

Completed Primary	26 (89.7%)	3 (10.3%)	p=.600
Secondary or Higher	59 (88.1%)	8 (11.9%)	
Years lived in this settlement			
Less than 2 Years	42 (80.8%)	10 (19.2%)	p=.290
2-5 Years	156 (82.1%)	34 (17.9%)	
5+ Years	225 (86.9%)	34 (13.1%)	
Number of people in the household			
2-5	84 (80.0%)	21 (20.0%)	p=.240
6-9	202 (87.1%)	30 (12.9%)	
10+	137 (83.5%)	27 (16.5%)	
No. of children in household			
1-3	87 (84.5%)	16 (15.5%)	p=.250
4-6	218 (86.9%)	33 (13.1%)	
7-9	88 (78.6%)	24 (21.4%)	
10+	30 (85.7%)	5 (14.3%)	
Hunger scale category			
No-Little Hunger	64 (88.9%)	8 (11.1%)	p=.440
Moderate	312 (84.1%)	59 (15.9%)	
Severe	47 (81.0%)	11 (19.0%)	

Child-reported limitations or difficulties participating			
Yes	350 (85.2%)	61 (14.8%)	p=.460
No	73 (82.0%)	16 (18.0%)	
Child-caregiver relationship			
Biological parent	219 (84.2%)	41 (15.8%)	p=.800
Biological relative	173 (84.4%)	32 (15.6%)	
Other - foster care, etc	31 (88.6%)	4 (11.4%)	

Table 4: Multi-variate model of child-reported depression (controlling for variables significant at bi-variate level)

Variables	Model 1		Model 2		Model 3	
	aOR (95% CI)	p-value	aOR (95% CI)	p-value	aOR (95% CI)	p-value
ntal warmth and affection (child-report)						
Low warmth and affection	REF					
Moderate warmth and affection	0.76 (.43, 1.32)	p=0.334				
High warmth and affection	0.56 (.24, 1.28)	p=0.169				
child-caregiver interaction						
Low frequency interactions			REF			
Moderate frequency of interaction			1.48 (.84, 2.61)	p=0.179		
High Frequency of interaction			1.82 (.84, 3.92)	p=0.128		
Parental self-efficacy						
Low self-efficacy					REF	
High self-efficacy					0.51 (.29, .90)	**p=0.019**
Sex of respondent						

Female	REF		REF		REF	
Male	1.40 (.73, 2.71)	p=.313	1.48 (.76, 2.89)	p=0.248	1.45 (.74, 2.82)	p=0.274
Years lived in this settlement						
Less than 2 Years	REF		REF		REF	
2-5 Years	0.63 (.29, 1.36)	p=.239	0.74 (.33, 1.67)	p=0.470	0.69 (.31, 1.53)	p=0.357
5+ Years	0.38 (.17, .85)	**p=.0189**	0.43 (.19, .99)	**p=0.047**	0.49 (.21, 1.14)	p=0.097
No of children in the Household						
1-3	REF		REF		REF	
4-6	0.38 (.20, .73)	**p=0.003**	0.40 (.21, .77)	**p=0.006**	0.38 (.20, .73)	**p=0.004**
7-9	0.58 (.28, 1.21)	p=0.148	0.60 (.28, 1.26)	p=0.175	0.58 (.27, 1.21)	p=0.145
10+	0.45 (.16, 1.30)	p=0.142	0.46 (.16, 1.32)	p=0.149	0.44 (.15, 1.29)	p=0.134
Financial difficulties						
No/ little financial difficulties	REF		REF		REF	
Serious financial difficulties	1.79 (1.05, 3.05)	**p=0.033**	1.67 (.98, 2.84)	p=0.060	1.77 (1.04, 3.02)	**p=0.035**

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HESPER					
Low number of serious problems (0-7)	REF		REF		REF	
High number of serious problems (8-13)	3.79 (2.17, 6.61)	**p=<.0001**	4.12 (2.36, 7.14)	**p=0.000**	4.28 (2.45, 7.47)	**p=0.000**
Child-caregiver relationship					
Biological parent	REF		REF		REF	
Biological relative	1.81 (1.05, 3.12)	**p=0.033**	1.82 (1.05, 3.15)	**p=0.032**	1.81 (1.05, 3.13)	**p=0.033**
Other	2.77 (1.09, 7.06)	**p=0.033**	2.86 (1.12, 7.29)	**p=0.028**	2.90 (1.14, 7.42)	**p=0.026**
Highest education level					
Never attended school	REF		REF		REF	
Any primary	0.77 (.40, 1.47)	p=0.429	0.80 (.42, 1.54)	p=0.510	0.78 (.41, 1.50)	p=0.463
Completed Primary	0.14 (.03, .73)	**p=0.019**	0.15 (.028, .76)	**p=0.022**	0.14 (.03, .72)	**p=0.018**
Secondary or Higher	0.65 (.26, 1.60)	p=0.346	0.59 (.24, 1.47)	p=0.256	0.64 (.26, 1.60)	p=0.341
Child-reported limitations or difficulties participating					
No	REF		REF		REF	

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Yes	2.99 (1.63, 5.48)	**p=<0.001**	2.96 (1.61, 5.43)	**p=0.000**	2.90 (1.58, 5.31)	**p=0.001**

Table 5: Multi-variate models for caregiver-reported child depression (controlling for variables significant at bi-variate level)

Variables	Model 4		Model 5	
	aOR (95% CI)	p-value	aOR (95% CI)	p-value
Parental warmth and affection (child-report)				
Low warmth and affection	REF			
Moderate warmth and affection	.89 (.51, 1.56)	p=.681		
High warmth and affection	.42 (.18, 1.10)	p=.054		
ental warmth and affection (caregiver-report)				
Low warmth and affection			REF	
Moderate warmth and affection			.41 (.21, .83)	**p=.014**
High warmth and affection			.20 (.08, .49)	**p<.001**
ental warmth and affection (caregiver-report)				
Financial difficulties				
No/ little financial difficulties	REF		REF	
Serious financial difficulties	2.30 (1.31, 4.04)	**p=.004**	2.57 (1.50, 4.77)	**p=.001**
HESPER				

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Low number of serious problems (0-7)	REF		REF	
High number of serious problems (8-13)	3.67 (2.16, 6.24)	**p<.001**	3.84 (2.27, 6.48)	**p<.001**