Intimate Partner Violence, Maternal and Paternal Parenting, and Early Child Development

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abstract

BACKGROUND AND OBJECTIVES: Previous research has demonstrated associations between maternal experience of intimate partner violence (IPV) and a range of adverse outcomes among women and their young children. However, few studies have examined the associations between maternal experience of IPV and early child development (ECD) outcomes in low- and middle-income countries (LMIC). Our objectives in this study were to examine the association between IPV victimization and ECD and assess whether the association was mediated by maternal and paternal stimulation.

METHODS: We combined cross-sectional data from the Demographic and Health Surveys for 15 202 households representing mothers and fathers of children aged 36 to 59 months in 11 LMIC. We used multivariable linear regression models to estimate the association between IPV victimization in the year preceding the survey and ECD, which we measured using the Early Child Development Index. We used path analysis to determine if the association between IPV victimization and ECD was mediated through maternal and paternal stimulation.

RESULTS: After adjusting for sociodemographic variables, IPV victimization was negatively associated with ECD ($\beta = -.11$; 95% confidence interval = $-.15$ to $-.07$). Path analysis indicated that the direct association between IPV victimization and ECD was partially and independently mediated through maternal and paternal stimulation.

CONCLUSIONS: Interventions that include components to prevent IPV may be effective for improving ECD in LMIC.

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WHAT'S KNOWN ON THIS SUBJECT: Previous studies, largely from high-income countries, have underscored the negative consequences of intimate partner violence (IPV) on early child development (ECD) outcomes. However, few studies in low- and middle-income countries have examined the association between IPV and ECD.

WHAT THIS STUDY ADDS: In this study, we find that maternal experience of IPV was negatively associated with ECD in 11 low- and middle-income countries. Additionally, this association was partially and independently mediated through maternal and paternal stimulation.

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The period from conception to age 5 years is one of the most critical periods in the life course, when the brain develops most rapidly and children begin to build foundational skills that have long-lasting effects on learning, health, behavior, and well-being outcomes later in life.[1] Yet in low- and middle-income countries (LMIC), 250 million (~43%) children <5 years old are at risk for not reaching their developmental potential.[2] Although various biological and psychosocial risks have been well established in relation to early child development (ECD) outcomes in LMIC, including nutritional deficiencies, inadequate stimulation, and other poverty-related factors,[3–7] few studies in LMIC have investigated the relationship between intimate partner violence (IPV) and ECD.[8,9]

Globally, it is estimated that 30% of women experience some form of physical or sexual violence from their husbands or partners in their lifetime.[10] Evidence from high-income countries has consistently shown negative consequences of IPV experience on young children's developmental outcomes.[11–13] Several studies have highlighted poorer maternal parenting behaviors (eg, greater aggression and less stimulation) as a primary mechanism underlying the effects of IPV on ECD outcomes.[14–16] In addition, an emerging body of literature has shown that fathers who perpetrate IPV are less engaged in stimulation and may even extend harmful behaviors to their children.[17–19] However, few studies to date, neither in high-income countries nor LMIC, have specifically examined paternal parenting as a mediator of the relationship between IPV and ECD outcomes. Considering how IPV involves both a perpetrator (ie, most often the father)[20] and victim (ie, most often the mother) and that each parent independently influences ECD,[21] it is important to jointly consider both parents and explore the relative degree to which the association between IPV and ECD may be mediated by maternal and paternal parenting.

Using data from 11 LMIC, the current study investigates the direct and indirect associations between IPV, maternal and paternal stimulation, and ECD outcomes. First, we hypothesize that IPV, as measured by maternal-reported experiences of victimization by their partners, is negatively associated with children's ECD scores, as measured by an index of learning, literacy and numeracy, socioemotional, and physical milestones. Second, we hypothesize that in families in which IPV occurs, both mothers and fathers would engage in fewer stimulation activities (ie, play and learning), which would independently mediate the direct association between IPV and ECD outcomes.

METHODS

Data

We used national data from the latest publicly available Demographic and Health Surveys (DHS).[22] These standardized household surveys collect representative, cross-sectional data on a range of population and health indicators in LMIC. All surveys employed a 2-stage cluster-randomized sampling design, stratifying by region and urban or rural area of residence. Within these stratified areas, primary sampling units (PSUs) were randomly selected on the basis of the probability proportional to population size, and an average of 25 houses were interviewed per PSU. A household questionnaire was administered, and women between the ages of 15 and 49 years were identified to complete a detailed women's questionnaire and a child questionnaire if they had a child <5 years of age.

Out of the total 74 publicly available surveys from the first year when the Early Child Development Index (ECDI) was introduced into the DHS (2011) until the time of analysis (May 15, 2019), only 11 national DHS included both the IPV questionnaire in the women's survey and the ECDI questionnaire in the children's survey. This resulted in a sample of 18 166 children aged 3 and 4 years and their mothers who had available information for ECD and IPV, respectively. We restricted our sample to mothers who were married or living with both their partners and children (2964 removed) because of the study focus on disentangling the maternal and paternal parenting mechanisms linking IPV and ECD in the household context. Our final analytic sample included 15 202 households with mothers and fathers of children aged 36 to 59 months from 11 LMIC.

Measures

Outcome

ECD was measured by using the ECDI.[23] The ECDI comprises 10 caregiver-reported, dichotomously scored items covering cognitive, literacy and numeracy, socioemotional, and physical development for children aged 36 to 59 months and has demonstrated validity on the basis of adequate model fit statistics from the results of confirmatory factor analysis.[24] In keeping with previous work that used the full 10-item index,[4,25] we created a composite score by summing the number of positive responses (range: 0–10) and then normalized the total sum score to mean = 0 and SD = 1 to allow for ease of interpretation (ECDI *z* score). We also conducted a sensitivity analysis using a 5-item version of the ECDI that represents the most developmentally appropriate items for children aged 36 to 59 months (Supplemental Table 3 includes ECDI items).[24]

Exposure

Mothers' IPV victimization by their husbands or cohabitating male partners was measured by using a modified version of the Conflict Tactics Scale, which has been found to be generally reliable and valid across populations and cultures.[26,27] Mothers reported on 13 behaviors in the last 12 months. We created 4 different dichotomous IPV exposure variables: (1) physical IPV, (2) sexual IPV, (3) emotional IPV, and (4) any IPV. Physical IPV was defined as any of 7 possible actions (eg, husband or partner punched you with his fist or with something that could hurt you or kicked, dragged, or beat you). Emotional IPV was defined as any of 3 possible actions (eg, husband or partner said or did something to humiliate you in front of others or threatened you or someone close to you). Sexual IPV was defined as any of 3 possible actions (eg, husband or partner physically forced you to have sexual intercourse with him even when you did not want to or forced you to perform any sexual acts you did not want to). Any IPV was defined as any of the 14 items from the physical, sexual, or emotional violence scales.

Covariates

We controlled for various socioeconomic and demographic variables known to be associated with ECD.[4,28] Child characteristics included age (in months) and sex (male or female). Caregiver characteristics included maternal and paternal highest level of education (no formal education, primary school, or secondary school or higher), maternal and paternal age (in 5-year age categories from 15 to 49 years), and maternal parity (number of children ever born). Household characteristics included household wealth index (quintiles within each country are based on a principal component analysis of household assets) and place of residence (urban or rural).

Mediators

Maternal and paternal stimulation was based on the primary caregiver's report of whether the child's mother and father engaged in the following 6 dichotomously scored play and learning activities with the child in the past 3 days: reading books or looking at pictures together, telling stories, singing songs, taking the child outside of the home compound, playing with child, and naming, counting, or drawing things with child. This measure has previously shown concurrent validity with other observational measures of parenting and the home environment and predictive validity with direct assessments of ECD outcomes.[29,30] In keeping with previous work,[25,28,31] we created a total stimulation score for each parent by summing the number of engaged activities (range: 0–6), with higher values indicating greater parental stimulation.

Statistical Analyses

We specified 2 linear regression models to determine the association between IPV victimization and ECDI *z* score in the pooled sample of 11 LMIC. Model 1 was a minimally adjusted model that controlled for child age, sex, and country-survey fixed effects. Model 2 was a fully adjusted model that controlled for the full set of covariates: child age, child sex, maternal and paternal education, maternal and paternal age, maternal parity, household wealth index, place of residency, and country-survey fixed effects. Additionally, we modeled each type of IPV (physical, sexual, and emotional) separately. We also conducted a sensitivity analysis using an alternative scoring approach for the ECDI based on a sum score of 5 of the 10 original items.[24]

We conducted path analysis to investigate whether the direct association between any IPV victimization and ECDI *z* score was mediated through maternal and paternal stimulation. Path analysis can simultaneously estimate multiple linear regression models between a network of variables in a model to decompose the total effect of a particular exposure variable of interest (ie, IPV victimization) into the direct (the proportion not mediated through maternal or paternal stimulation) and indirect (the proportion mediated through maternal and paternal stimulation) effect on an outcome measure of interest (ie, ECDI *z* score). Moreover, it can explicitly account for shared sources of variance between variables (eg, maternal and paternal stimulation that are based on the same caregiver's report). We included the same set of covariates for each of the paths in the model as in the fully adjusted linear regression model.

Path models used robust maximum likelihood estimation to account for missing data, and covariances were freely estimated among all exogenous variables and between maternal and paternal stimulation. We reported standardized direct and indirect path coefficients (β) for ease of interpretation. In addition to testing the indirect effects using the δ method,[32] we used biased-corrected bootstrapping procedures with 5000 draws[33] to estimate the most accurate confidence intervals (CIs) and determine the significance for the indirect effects between IPV and ECD. Satisfactory model fit was indicated by a comparative fit index score $\geq$0.90, a Tucker-Lewis index score $\geq$0.90, a root mean squared error of approximation $\leq$0.08, and a standardized root mean squared residual $\leq$0.08.[34] The traditional goodness-of-fit criterion of a nonsignificant χ^2 test was relaxed because the χ^2 value is known to be influenced by large sample sizes.[35]

Linear regression analyses were conducted by using Stata 15 (Stata Corp, College Station, TX), and path

analysis was conducted by using MPlus version 8. SEs across all models were clustered at the PSU level within each country to account for the complex DHS design. The significance level for all analyses was set at $P < .05$.

RESULTS

Our final sample included 15 202 mothers of children aged 36 to 59 months from national DHS conducted between 2011 and 2018 in 11 countries. Table 1 shows sample characteristics and compares distributions stratified by maternal experience of IPV. The mean age of children was 47.2 months, and nearly half of the children were girls (49.9%). On average, mothers were 30.8 years old and 25.3% had no formal education, whereas fathers were 37.1 years old and 17.7% had no formal education. Approximately two-thirds of households (64.8%) were in rural areas, and half (50.4%) were in the poorest 2 wealth quintiles.

More than one-third of mothers (35.4%) reported experiencing any IPV in the 12 months preceding the survey, ranging from 19.6% in Senegal to 49.9% in Cameroon (Supplemental Table 4 includes country-specific data). In the pooled sample, 20.2% of mothers reported physical violence, 26.4% reported emotional violence, and 10.3% reported sexual violence. Overall, children's average ECDI score was 5.4 out of 10, ranging from 4.9 in Togo to 6.0 in Cambodia and Honduras. Of a total of 6 activities, mothers engaged in an average of 2.2 stimulation activities whereas fathers engaged in an average of 1.2 activities in the past 3 days. On average, mothers who experienced IPV were younger, were less educated, had more children, were more likely to live in rural areas, were poorer, were less engaged in stimulation, and had children with lower ECDI scores compared with mothers who did not experience IPV.

Table 2 shows the associations between IPV victimization and children's ECDI scores. Adjusting for child age, sex, and country fixed effects (model 1), maternal experience of any IPV was negatively associated with children's ECDI *z* scores (β = −.15; 95% CI: −.19 to −.11). After adjusting for the full set of covariates (model 2), the association between maternal experience of any IPV and children's ECDI *z* scores was slightly attenuated but remained significant (β = −.11; 95% CI: −.15 to −.07; Supplemental Table 5 shows covariate regression coefficients). Negative associations between IPV victimization and children's ECDI *z* scores were robust in alternative fully adjusted models that separately examined each type of IPV: physical (β = −.12; 95% CI: −.16 to −.07), emotional (β = −.11; 95% CI: −.15 to −.07), and sexual (β = −.10; 95% CI: −.15 to −.04). The negative associations between any IPV or each IPV type and ECD were robust in the sensitivity analysis that used a 5-item version of the ECDI (Supplemental Table 6).

Figure 1 presents the results of the path model for the associations between IPV victimization, maternal and paternal stimulation, and ECDI *z* scores. The overall model fit was good (χ^2[36] = 10 376.54; $P < .001$; comparative fit index score = 0.98; Tucker-Lewis index score = 0.94; root mean squared error of approximation = 0.07; standardized root mean squared residual = 0.02). IPV was negatively associated with maternal stimulation (β = −.02; $P < .05$) and paternal stimulation (β = −.04; $P < .001$) after controlling for child age, child sex, parental education, parental age, maternal parity, household wealth index, place of residency, and country in each path. Maternal and paternal stimulation were each positively associated with children's ECD scores (β = .06 [$P < .001$] and β = .06 [$P < .001$], respectively) after controlling for all covariates. There remained a negative direct association between IPV and ECD (β = −.06; $P < .001$) after controlling for all covariates and maternal and paternal stimulation.

Indirect effects indicated that maternal stimulation independently mediated 1.5% of the association between IPV and ECDI *z* scores (β = −.001; $P < .055$; bias-corrected bootstrapped 95% CI: −.002 to .000). Additionally, paternal stimulation independently mediated 3.0% of the association between IPV and ECDI *z* scores (β = −.002; $P < .001$; bias-corrected bootstrapped 95% CI: −.004 to −.001). These results indicate that the negative association between IPV and ECD was modestly explained by lower levels of maternal and paternal stimulation.

DISCUSSION

Our primary study objectives were to investigate the association between maternal IPV victimization and ECD and to test whether maternal and paternal stimulation mediated this association in a sample of 15 202 parents of children aged 36 to 59 months in 11 LMIC. More than one-third of our sample of women had experienced some form of IPV perpetrated by their husbands or male partners in the year preceding the study, most commonly physical and/or emotional violence. First, we found that maternal experiences of IPV were negatively associated with ECD. Second, we found that the negative association between IPV and ECD was explained, to a modest degree, by lower levels of maternal and paternal stimulation. Our results underscore the importance of preventing violence against women for the promotion of ECD in LMIC.

Our findings extend the broader literature in LMIC that has primarily focused on IPV and child health and nutrition outcomes[36–38] and confirms

TABLE 1 Sample Characteristics Stratified by Maternal Exposure to IPV in 11 LMIC

	Total Sample (N = 15 202)	Maternal Exposure to IPV		
		No (N = 9827; 64.6%)	Yes (N = 5375; 35.4%)	P[a]
Outcome: ECDI total score, mean (SD)	5.39 (1.74)	5.51 (1.73)	5.18 (1.75)	<.001
Exposure to IPV, *n* (%)				
Any	5375 (35.36)	—	5375 (100)	—
Physical	3075 (20.23)	—	3075 (57.21)	—
Emotional	4013 (26.40)	—	4013 (74.66)	—
Sexual	1562 (10.27)	—	1562 (29.06)	—
Child characteristics				
Sex, *n* (%)				
Female	7580 (49.86)	4904 (49.90)	2676 (49.79)	.89
Male	7622 (50.14)	4923 (50.10)	2699 (50.21)	
Age, mo, mean (SD)	47.22 (6.88)	47.27 (6.89)	47.11 (6.85)	.16
Parental characteristics				
Maternal age, y, *n* (%)				
15–19	176 (1.16)	108 (1.1)	68 (1.27)	<.001
20–24	2405 (15.82)	1469 (14.95)	936 (17.41)	
25–29	4473 (29.42)	2844 (28.94)	1629 (30.31)	
30–34	3917 (25.77)	2533 (25.78)	1384 (25.75)	
35–39	2529 (16.64)	1704 (17.34)	825 (15.35)	
40–44	1318 (8.67)	897 (9.13)	421 (7.83)	
45–49	384 (2.53)	272 (2.77)	112 (2.08)	
Paternal age, y, *n* (%)				
15–19	11 (0.08)	7 (0.08)	4 (0.08)	<.001
20–24	487 (3.51)	292 (3.27)	195 (3.94)	
25–29	2261 (16.3)	1437 (16.1)	824 (16.67)	
30–34	3765 (27.15)	2428 (27.21)	1337 (27.04)	
35–39	3368 (24.29)	2176 (24.38)	1192 (24.11)	
40–44	2443 (17.62)	1593 (17.85)	850 (17.19)	
45–49	1533 (11.05)	991 (11.1)	542 (10.96)	
Maternal education, *n* (%)				
None	3849 (25.32)	2429 (24.72)	1420 (26.42)	<.001
Primary	6150 (40.46)	3753 (38.19)	2397 (44.6)	
Secondary	4101 (26.98)	2777 (28.26)	1324 (24.63)	
Higher than secondary	1102 (7.25)	868 (8.83)	234 (4.35)	
Paternal education, *n* (%)				
None	2648 (17.68)	1734 (17.92)	914 (17.24)	<.001
Primary	5741 (38.32)	3531 (36.48)	2210 (41.67)	
Secondary	5410 (36.11)	3532 (36.5)	1878 (35.41)	
Higher than secondary	1182 (7.89)	881 (9.1)	301 (5.68)	
No. children born to mother, mean (SD)	4.18 (2.27)	4.09 (2.26)	4.34 (2.27)	<.001
Maternal stimulation, mean (SD)	2.22 (2.08)	2.31 (2.13)	2.05 (1.98)	<.001
Paternal stimulation, mean (SD)	1.17 (1.63)	1.25 (1.68)	1.02 (1.52)	<.001
Household characteristics, *n* (%)				
Residence				
Urban	5353 (35.21)	3664 (37.29)	1689 (31.42)	<.001
Rural	9849 (64.79)	6163 (62.71)	3686 (68.58)	
Household wealth quintile				
Poorest	4135 (27.2)	2556 (26.01)	1579 (29.38)	<.001
Poorer	3520 (23.15)	2227 (22.66)	1293 (24.06)	
Middle	3095 (20.36)	1973 (20.08)	1122 (20.87)	
Richer	2507 (16.49)	1662 (16.91)	845 (15.72)	
Richest	1945 (12.79)	1409 (14.34)	536 (9.97)	

—, not applicable.

[a] P values are the result of t tests for continuous variables and χ^2 tests for categorical variables.

the results of a few recent studies that have newly revealed negative direct associations between IPV and children's developmental outcomes. A cross-sectional study from Tanzania found that maternal experiences of physical and sexual IPV were associated with poorer language and motor development among children aged 18 to 36 months.[6] Another cross-sectional study from South Africa found that maternal experiences of any IPV were associated with greater behavioral problems among preschool-aged

TABLE 2 Unadjusted and Adjusted Associations Between IPV and ECDI *z* Scores Among Children Aged 36 to 59 Months From 11 DHS

IPV	Model 1, β (95% CI)	Model 2, β (95% CI)
Any	−.15** (−.19 to −.11)	−.11** (−.15 to −.07)
Physical	−.18** (−.22 to −.13)	−.12** (−.16 to −.07)
Emotional	−.14** (−.18 to −.10)	−.11** (−.15 to −.07)
Sexual	−.14** (−.19 to −.08)	−.10* (−.15 to −.04)

Model 1 controls for child sex, child age, and country-survey fixed effects. Model 2 controls for child sex, child age, maternal and paternal age, maternal and paternal education, maternal parity, place of residence, household wealth quintile, and country-survey fixed effects.

* $P < .01$.

** $P < .001$.

children.[7] However, neither study investigated potential mechanisms or considered the role of fathers in relation to IPV and ECD.

Our study revealed that both maternal and paternal stimulation explained a small proportion of the total association between maternal experiences of IPV and poorer ECD in LMIC. No previous study known to us has jointly tested both maternal and paternal parenting as mediators of the association between IPV and ECD outcomes. Instead, previous studies in high-income countries have primarily focused on mechanisms through maternal parenting exclusively[39,40] or shown that men's IPV perpetration is associated with poorer parenting behaviors with their young children without also examining the relations with ECD outcomes.[17,19] Our results suggest that the negative association between IPV and ECD is partially explained by a double burden that constrains not only the victim's (ie, in this article, the mother's) but also the perpetrator's (ie, the father's) caregiving behaviors with their child. Importantly, the indirect effects through maternal and paternal stimulation were small. Given the modest degree of mediation through these 2 particular pathways, future researchers should investigate other parental behavioral (eg, responsivity and physical discipline) and psychosocial mechanisms (eg, stress and depression), while accounting for the roles of both mothers and fathers, which may further explain the persisting direct association between IPV and ECD.[15,41,42]

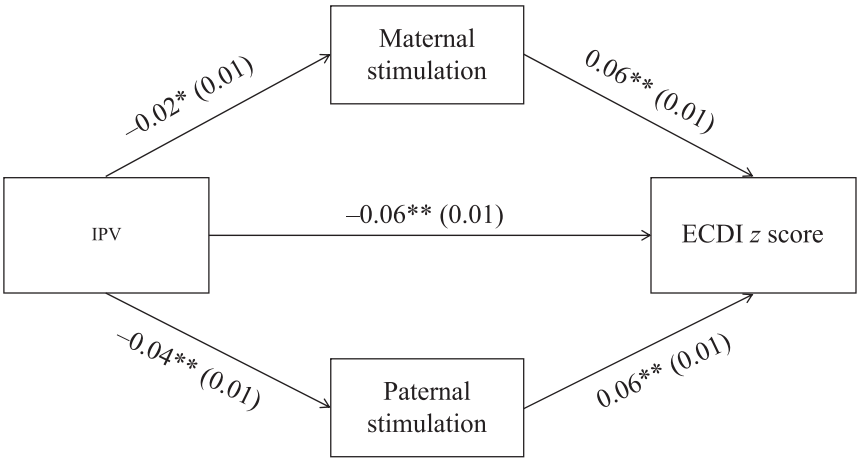

FIGURE 1
Path model of the associations between IPV, maternal and paternal stimulation, and ECD from 11 DHS. All paths are adjusted for child sex, child age, maternal and paternal age, maternal and paternal education, maternal parity, place of residence, household wealth quintile, and country fixed effects. Coefficients represent standardized path coefficients: β (SE). * $P < .05$; ** $P < .001$.

This study has several limitations. The DHS data are cross-sectional, and therefore, causality in the observed associations cannot be established. The pooled analytic sample is based on the 11 country surveys that collected data on both IPV and ECD, and findings are not generalizable to all LMICs. IPV victimization, maternal and paternal stimulation, and ECD were based on maternal report, which raises the possibility of recall, common reporter, and social desirability biases. Given that IPV is often underreported[43] and that we include only violence perpetrated by the husband or cohabiting partner, it is likely that IPV is underestimated. Furthermore, the measures for IPV, stimulation, and ECD were based on relatively brief measures that do not fully capture duration, quality, or severity. Finally, our selection of covariates was limited to the available data collected in the DHS, and we were unable to control for other important variables, such as children witnessing or experiencing violence, other types of violence, or couple's conflict, which may be possible confounders of the association between IPV and ECD.[44–46] Further adjusting for such omitted covariates that are associated with both maternal IPV victimization and ECD may likely reduce the magnitude of our estimates.

CONCLUSIONS

Our results reveal that maternal IPV victimization within households is a significant global health issue that is negatively associated with young children's developmental outcomes in LMIC. Our findings suggest that strategies to improve ECD in LMIC, which have most

commonly focused on increasing early learning opportunities and enhancing the quality of mother-child dyadic relationships,[3] may have greater success by additionally integrating components that prevent IPV.[47] Given that lower levels of maternal and paternal stimulation explained a small degree of the association between IPV and ECD, future researchers should test alternative family process mediators, which should include the contributions of mothers and fathers in their roles as both partners and parents within families.[48] A more holistic understanding of the key pathways will inform the design of effective interventions that are likely to improve the safety, security, and quality of family relationships and environments that are essential in promoting the healthy development of young children globally.

ABBREVIATIONS

CI: confidence interval
DHS: Demographic and Health Surveys
ECD: early child development
ECDI: Early Child Development Index
IPV: intimate partner violence
LMIC: low- and middle-income countries
PSU: primary sampling unit

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