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Prevalence of childhood exposure to intimate partner violence in low-income and lower-middle-income countries: a systematic review and meta-analysis

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Authors' contributions: BK developed the research questions and conducted the searches. BK and MK screened the papers for inclusion and extracted the data for the analysis. MK provided detailed guidance throughout the review process. BK performed the data analysis. TP provided advice on research methods and verified the analytical methods. BK took the lead in writing the manuscript. All authors provided critical feedback and helped shape the research, analysis and draft manuscript. TP and HM provided overall guidance and supervision.

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Abstract

Objective

To establish the proportion of children exposed to intimate partner violence in low-income and lower-middle-income countries.

Design

Systematic review and meta-analysis

Setting

Low-income and lower-middle income countries according to the World Bank country and lending classification.

Methods

We identified prevalence estimates of childhood exposure to IPV reported in national and sub-national population-based surveys from low-income and lower-middle income countries through systematic searches of seven electronic databases, citation chaining, and hand searching of specialized journals and performed a systematic review and meta-analysis of lifetime and past-year prevalence.

Results

A total of 5556 articles were identified. Following screening procedures, a total of 85 lifetime prevalence estimates and 6 estimates of past-year prevalence were available for synthesis. The overall random-effects pooled lifetime prevalence of childhood exposure to IPV was 29% (95% CI: 26%; 31%). The pooled past-year prevalence was 35% (95% CI: 21%; 48%). The lifetime prevalence disaggregated by WHO regions ranged from 21% to 34%. There were no statistical differences in prevalence estimates from samples of men and women.

Conclusions

We found about a third of children worldwide have been exposed to IPV. The heterogeneity between estimates was large and was not explained by available study and sample characteristics. Our findings indicate that children's exposure to IPV in low-income and lower-middle-income countries is a major public health issue.

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Strengths and limitations of this study

- This is the first systematic review and meta-analysis assessing the prevalence of childhood exposure to intimate partner violence in low-income and lower-middle-income countries.
- The systematic review responds to a policy-relevant priority identified by stakeholders from low-income and middle-income countries.
- Despite being a novel research area, we were able to retrieve a large number of reliable prevalence estimates from geographically and culturally diverse low-income and lower-middle-income countries from all WHO regions.
- Common to most meta-analyses in violence research, the results may yield significant heterogeneity that cannot be explained.
- The lack of consensus around measurements is a limitation that makes it difficult to derive a global prevalence figure for low-income and lower-middle-income countries.

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Introduction

Intimate partner violence (IPV) is a serious human rights and public health problem globally. Worldwide, one in three women is affected by IPV (1). Although less studied, IPV can also affect men and individuals with other gender identities. Such violence often takes place in the presence of children and can have severe and long-lasting impact on children's health and development.

Childhood exposure to IPV includes either the direct observation or mere awareness without directly seeing or hearing violent acts or abuse between caregivers, who are current or former spouses or intimate partners (2, 3). Childhood exposure to IPV has been associated with a broad range of physical and mental health problems, health risk behaviours and social consequences. Mental health consequences include increased risk for depression, anxiety, conduct disorder, adjustment problems and posttraumatic stress disorder (4, 5). Children exposed to IPV have a higher likelihood of engaging in health risk behaviours including tobacco use, the harmful use of alcohol, substance use or unsafe sex (6). IPV exposure has also been associated with reduced cognitive ability and educational achievement (7).

Despite the widespread nature of IPV and its severe consequences for children, major gaps remain in estimating the prevalence of childhood exposure to IPV. Retrospective studies from high-income countries show that 8-25% of children are exposed to IPV in their home (2). There is less data available on prevalence of exposure to IPV among children living in low-income and lower-middle-income countries. In recent years, however, primary prevalence studies have become available and data have been collected in the context of general health surveys or surveys directly focused on violence and abuse. To our knowledge, no systematic review or meta-analysis has attempted to synthesize existing prevalence studies of childhood exposure to IPV from low-income and lower-middle-income countries.

Increased knowledge about the burden of children's exposure to IPV can help to better assess the broader impact of IPV, its potential effects on child health, and the implications for service provision.

To address the need for a global overview of prevalence estimates from lower-income economies, we conducted a systematic review and meta-analysis of existing estimates of prevalence of children's exposure to IPV from low-income and lower-middle-income countries around the world.

Methods

Research questions and outcome variables

This systematic review addresses the following research questions: (1) What is the lifetime prevalence of childhood exposure to IPV among children and adults in low-income and lower-middle-income countries? (2) What is the past-year prevalence of exposure to IPV among children in low-income and lower-middle-income countries?

The outcome of interest, childhood exposure to IPV, was defined as direct observation of violence between caregivers, as well as the mere awareness of violent acts or abuse between adults who are current or former spouses or intimate partners (2, 3). We included primary quantitative studies that measured the prevalence of current and past exposure to IPV prior to the age of 18.

The study followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines (**Supplementary Material 1**). A protocol for this review was registered at PROSPERO Registry of the Centre for Reviews and Dissemination of the University of York (https ://www.crd.york.ac.uk/PROSPERO; ID:CRD 42019119698).

Literature Search Strategy

A four-step search strategy was applied to identify relevant studies. First, we searched seven electronic databases: PubMed, CINAHL, ERIC, PsycINFO, Web of Science, WHO Global Index Medicus, and Violence and Abuse Abstracts. A search strategy was developed for each database using a combination of free text and controlled vocabulary and was reviewed by a PhD-trained information scientist with extensive experience in systematic review methodology and systematic reviews focused on exposure to various types of interpersonal violence, including childhood exposure to IPV. All searches were conducted in May 2019. All papers published until May 2019 were considered. Searches were conducted in English language but no language restrictions were placed on the search results.

The search terms include combinations and iterations of "prevalence", "childhood", "intimate partner violence" and "exposure" or "witnessing". The full search strategy for each database is available in **Supplementary Material 2**. Searches for each database were evaluated against a sub-sample of ten papers that were predetermined by the research team to meet the inclusion criteria (8).

Database searches were supplemented by hand searches of specialized journals focused on interpersonal violence, which were conducted in May 2019. The journals included the *Journal of Child Abuse & Neglect*, *Trauma, Violence & Abuse*, and *Child Maltreatment*. Forward and backward citation chaining of included papers was conducted from April until May 2020 to capture any papers potentially missed by database searches and which may have been published up until the submission of this manuscript for publication.

Eligibility Criteria

Male, female and mixed-sex[1] samples from low-income and lower-middle-income countries according to World Bank country and lending classification (as of October 2019) were considered (9). Samples collected at national or sub-national levels were eligible. Data from both household surveys and school surveys were considered. The survey response rate had to be above 60%.

Title and Abstract Screening, Full-Text Screening, and Data Extraction

Titles and abstracts of all articles identified via the search strategy were screened by one reviewer (BK). A sample (5%) of the total records was screened by a second reviewer (MK) to check the consistency of the application of the inclusion/exclusion criteria. Disagreements were resolved through discussion and involvement of a third reviewer (HM). The interrater reliability was substantial with Cohen's Kappa k=0.74.

[1] Some surveys use biological sex and some surveys use the term gender.

At the second stage, 104 full texts were assessed for eligibility by one reviewer (BK) applying the checklist with inclusion/exclusion criteria. A subset (20%) of the full texts was assessed by a second reviewer (MK). The agreement between the reviewers was substantial with Cohen's Kappa k=0.74.

A standardized template was created for data extraction. The main variables included study information, characteristics of the sample (geographic and sociodemographic information), study methodology (study type, sampling method, survey item, mode of data collection), and prevalence estimates. Data extraction for all included studies was conducted by one reviewer (BK). Twenty papers underwent independent data extraction by a second reviewer (MK). There was perfect agreement on the extraction of study information, including prevalence estimates, across reviewers.

Quality Assessment and Assessment of Bias

Study quality was assessed during the data extraction process using a standardized risk of bias tool for prevalence studies (Table 1) adapted from Hoy et al. (10). The nine items cover different aspects of external and internal validity. Two reviewers classified each of the items describing potential sources of bias into low risk or high risk. A summary score was then calculated by adding all the items rated high risk. A summary score of 0 – 3 is considered low risk, 4 - 6 moderate risk, and a score of 7 - 9 indicates the study is at high risk of bias. No studies were excluded based on the risk of bias rating.

Most of the data used in our synthesis was published in the context of general health surveys. Reporting data on childhood exposure to IPV was not the primary purpose of any of the publications, so we do not expect a risk of publication bias.

Table 1 Risk of Bias assessment (adapted from Hoy et al., 2012)

External validity (maximum score=4)
Was the study's target population a close representation of the national population in relation to relevant variables such as age, sex, occupation, urban/rural population? (Yes: low risk=0 points; no: high risk=1 point)
Was the sampling frame a true or close representation of the target population (household sample and/or primary school sample)? (Yes: low risk=0 points; No: high risk=1 points)
Was some form of random selection used to select the sample, or was a census undertaken? (Yes: low risk=0 points; no: high risk=1 point)
Was the likelihood of non-response bias minimal (Response rate >= 75% or explicitly stated that there was no difference between responders and non-responders)? (Yes: low risk=0 points; no: high risk=1 point)
Internal validity (maximum score=5)
Were data collected directly from the subjects (as opposed to a proxy)? (Yes: low risk=0 points; no: high risk=1 point)
Was an acceptable case definition used in the study? Where subjects asked whether they witnessed or were aware of physical, sexual or emotional violence between their caregivers? (Yes: low risk=0 points; no: high risk=1 point)
Was the study instrument that measured the parameter of interest shown to have reliability and validity (item derived from an instrument that had widely been tested for reliability or validity, or explicitly stated that validity has been measured)? (Yes: low risk=0 points; no: high risk=1 point)

Was the same mode of data collection used for all subjects? (Yes: low risk=0 points; no: high risk=1 point)
Were the numerator(s) and denominator(s) for the parameter of interest appropriate? (Yes: low risk=0 points; no: high risk=1 point)

Data Synthesis

A meta-analysis was performed to synthesize the lifetime and past-year prevalence of childhood exposure to IPV. Prevalence rates were calculated from raw proportions or percentages reported in the included studies. Where possible, female and male samples were considered separately. Samples for which prevalence rates were not disaggregated by sex were included in a "mixed" category. When studies provided different estimates for exposure to physical violence and emotional violence for the same sample, we chose "physical violence", as this was the measurement applied by the majority of the studies. All analyses were done with METAPROP in STATA 14.0 designed to perform meta-analyses of proportions. The programme computes 95% confidence intervals using the score statistic and the exact binomial method and incorporates the Freeman-Tukey double arcsine transformation of proportions (11). The overall prevalence estimates were pooled based on a random-effects model, which takes into account that observed differences between proportions cannot be entirely attributed to the sampling error and that other factors such as true differences between study populations and methodologic differences can also contribute. Weights were applied according to the inverse of the variance. Given that within-study variance was relatively small and the variance between studies was substantial, the weights were similar across all studies. 95% CIs were calculated around the pooled estimates. To assess the extent of variation between studies, heterogeneity tests with the I^2 statistic were performed.

No pre-specified stratified analyses were planned for this study. Additional sub-group analyses and visual inspection of the data were conducted post hoc, following the observation of the high heterogeneity of the prevalence estimates.

Results

A total of 6903 records were obtained through database searching and 265 additional records through hand searches. After duplicates were removed, 5556 titles and abstracts were screened for their relevance. This first screening resulted in 100 potentially eligible studies, which were then screened using the full text of the article. After full-text screening, 56 studies were identified for inclusion in the review. Main reasons for exclusion were that several papers were published using data from the same sample or did not provide prevalence estimates. Detailed reasons for exclusion are provided in the PRISMA diagram (**Figure 1**). If several publications drew on data from the same study, the study that provided the most information, was selected. Forward and backward citation chaining of included studies yielded another 7 eligible articles, so that a total of 63 studies were included in the review (**Supplementary Material 3**). Some of these studies are multi-country studies, or they disaggregated data collection by males and females, so that the total number of available prevalence estimates is n=93.

We retrieved studies from 29 low-income countries with data from 231 512 individuals. Twenty-seven estimates were based on data from representative national surveys and 66 estimates were based on data from sub-national administrative units such as regions or districts. Most studies reported applying some form of random sampling (n= 63); 4 studies used convenience samples. The included studies yielded 85 estimates for lifetime prevalence of childhood exposure to IPV and six estimates on past-year prevalence. Two estimates on past-month prevalence were extracted from one study. Sixty-eight prevalence estimates

were determined from household sample data; 25 prevalence estimates were based on data from school-based samples and two prevalence estimates were based on data collected in public places in the community. According to Hoy et. al., nine studies had a moderate risk of bias, and 58 studies had a low risk of bias. Most studies measured exposure to physical IPV between caregivers (n=60), seven studies measured exposure to physical and emotional IPV. Twenty-two studies operationalized exposure to physical IPV between caregivers as bi-directional violence, and 45 studies explicitly asked whether IPV was perpetrated by the father against the mother.

Pooled prevalence estimates were determined for lifetime and past-year prevalence. Only two studies with few participants collected data on past-month prevalence, so we did not pool these estimates. The prevalence estimates were disaggregated by gender, wherever this information was available. Studies that did not disaggregate by gender were included in the category "mixed samples".

The overall random-effects pooled lifetime prevalence of childhood exposure to IPV across all samples (n=85) was 29% (95% CI: 26%; 31%) with a high level of heterogeneity across studies (I^2=99.67%, p<0.001 ; T^2=0.02). Lifetime prevalence estimates ranged from a minimum of 2% to a maximum of 78%, with an interquartile range from 16% to 37% and a median of 26%. The pooled past-year prevalence (n=6) was 35% (95% CI: 21%; 48%) with similarly high levels of heterogeneity (I^2=98.3%, p<.001; T^2=0.03). The past-year prevalence estimates spread from 12% to 57%. The interquartile range reached from 22% to 49% with a median prevalence of 34%.

The lifetime prevalence in studies that involved either male or female samples or provided a gender breakdown (n=76) was 27% (95% CI: 23%; 30%) for females and 31% (95% CI 25%; 38%) for males. Minimum and maximum values and quartiles for female, male and mixed samples are shown in **Figure 2**. The past-year prevalence (n=4) was 29% (95% CI 26%, 32%) for females and 28% (95% CI 25%, 31%) for males. The difference between female, male and mixed samples was not statistically significant for lifetime (p=.388) or for past-year prevalence (p=.656).

We explored whether prevalence rates varied with certain study characteristics and conducted post hoc subgroup analyses to explore differences based on the data collection setting (household vs. school), and the risk of bias rating of the studies according to the Hoy et al. scale. Neither the setting (p=.150) nor the risk of bias score (p=.240) led to statistically significant differences of the prevalence estimates.

The global and WHO regional prevalence estimates for childhood exposure to IPV are shown in **Figure 3**. The pooled prevalence in low-income and lower-middle-income countries in the South East Asian Region (SEARO), based on 23 samples, was 26% (95% CI: 21%; 30%), in the African Region (AFRO) 34% (95% CI: 27%;40%) based on 30 samples, in the Region of the Americas (PAHO) 34% (95% CI: 19%;49%) based on 7 samples, in the Western Pacific Region (WPRO) 27% (95% CI: 20%;34%) based on 13 samples, in the Eastern Mediterranean Region (EMRO) 21% (95% CI: 15%;26%), based on 7 samples, and in low-income and lower-middle-income countries from the European Region (EURO) 21% (95% CI: 12%;29%) based on 5 samples. A breakdown by geographical region and gender is available in annex 2. The heterogeneity between geographical regions was statistically significant (p=.043).

Discussion

We used meta-analytical methods to pool prevalence estimates of childhood exposure to IPV, which were reported in 67 studies, citing results of 95 samples from low-income and lower-middle-income countries. The average pooled lifetime prevalence was 29% (past-year prevalence: 35%), so almost one in three individuals reported being exposed to IPV during their childhood. Based on 2019 population estimates

(12), this amounts to 117 million children in low-income and lower-middle-income countries who reported exposure to IPV. We found high levels of heterogeneity across studies. The median prevalence of the studies we reviewed was 26%, with an interquartile range between 16% and 37% for the lifetime prevalence of childhood exposure to IPV.

To our knowledge there has not been a systematic review of the global prevalence of children's exposure to IPV in low-income or lower-middle income countries. A review of child maltreatment from high-income countries (13) has shown that 8 to 25% of children witnessed IPV. A review from high- and middle-income countries in the Asia Pacific Region (14) reported that 10-39% of children were exposed to IPV. Our prevalence estimates are similar to global estimates of IPV, whereby one in three women report experiencing IPV in their lifetime (1).

Childhood exposure to IPV is still not receiving attention at a level that is similar to other forms of violence, although the topic has gained visibility in recent years. It often falls in between the gaps of constituencies that primarily address violence against children and those that address violence against women. This is also reflected in international agreements. While physical, psychological and sexual abuse of women and physical and sexual abuse of children are explicitly addressed in the targets of the 2030 Agenda for Sustainable Development, which has been adopted by all United Nations Member States in 2015, the international community did not take into account that these forms of violence are often linked and that violence against women can also have detrimental effects on children.

Statistically significant differences were found between WHO regions. Childhood exposure to IPV was highest in the Americas and the African Region and lowest in low-income countries of the European Region and the Eastern Mediterranean Region. Factors that could explain the variance between regions include country- or culture-specific social norms that influence family dynamics and hence the true frequency of occurrence of IPV, differences in IPV occurring in front of children or concealed from children, the social acceptability for children to admit to being exposed to IPV, differences in survey methods including variable semantic content of survey items across languages, or other methodologic differences. For the most part, we were not able to explain the observed variability between studies. Nevertheless, since regional averages ranged from 21% to 34%, or between one in five and one in three children, it is fair to say that childhood exposure to IPV is a major public health issue worldwide.

Although we found prevalence estimates from almost half of the countries that are classified as low-income and lower-middle-income countries, prevalence studies seem to be sparse in large parts of Africa, Maghreb, in countries with civil war and conflict, and in countries with small populations. This can only partially be explained by the fact that we only considered papers that were published in certain languages.

Similar to findings from surveys from high income countries, we did not find statistically different prevalence estimates between male and female samples (15, 16). This appears surprising, as in many societies, especially when traditional gender norms persist, girls tend to spend on average more time at home than boys (17).

High heterogeneity seems to be a shared feature of prevalence reviews on children's exposure to IPV (13, 14) and on other types of violence against children (18-20). The large variance we found is likely associated with common methodological issues related to how prevalence estimates are derived or due to a true variability of exposure to IPV. We did not find that study characteristics such as the risk of bias rating or the setting in which data was collected could explain the heterogeneity. There are few analyses of how study characteristics influence prevalence in child maltreatment research, and none in the area of childhood exposure to IPV. Meta-analyses in other areas of child maltreatment prevalence research found

that less rigorous sampling strategies and smaller sample sizes were associated with higher prevalence estimates (20, 21).

There are several strengths of this systematic review and meta-analysis. It is the first study to synthesize existing prevalence data on childhood exposure to IPV from low-income and lower-middle-income countries. Although measurement issues make it difficult to derive a global prevalence figure, results of our review indicate that children's exposure to IPV is a very important public health problem across countries.

Research implications of findings

The wide confidence intervals around the estimates and the large heterogeneity between studies found in our study and in other studies on the victimization of children highlights the importance of further research to identify and address the sources of such large variance. It would be important to establish to what extent the heterogeneity is due to real variations in childhood exposure to IPV and to what extent it is a methodologic artefact.

Future research would thereby benefit from clear definitions of childhood exposure to IPV. While some definitions are more narrow and explicitly consider seeing or hearing instances of physical IPV, others apply a broader definition, which includes being aware of violence without directly observing abusive acts (22).

Although there is some congruence in the measurement instruments used to assess the prevalence of childhood exposure to IPV, there is still no gold standard. It remains to be determined whether the various instruments that are applied are comparable. Differences in operationalizations have led to variability in items measuring IPV exposure. For example, some items only consider IPV committed by the male partner, while other items consider IPV committed by both the male and female partner; the latter is often referred to as 'bidirectional violence. To improve the accuracy and comparability of items that measure childhood exposure to IPV, instruments should specify the type of IPV exposure (physical, emotional, sexual), the person who committed the violence, including their gender, and whether the abuse was directly observed. Further research is needed to develop measures that are reliable and valid, and appropriate for use across countries to facilitate comparisons.

Practice and policy implications

Our findings show that children's exposure to IPV is widespread in low-income and lower-middle-income countries. Given that childhood exposure to IPV is linked to a range of physical and mental health problems, health risk behaviours and social consequences (5, 23, 24) including in low-income countries (25), healthcare and social service providers should consider the impact that IPV has on children, when providing care and services to victims of IPV.

Services for child and adult victims of IPV are commonly not delivered in an integrated manner. Policy makers should invest in the development of integrated interventions for IPV and evaluate whether they lead to better health outcomes for children, particularly in settings with limited human and financial resources.

Limitations

Given the large heterogeneity between studies, we recommend caution in drawing conclusions about a global estimate for childhood exposure to IPV. The pooled estimate of the random effects model cannot be interpreted as universal true effect; rather it is the average of survey-specific estimates.

The items that were used to measure childhood exposure to IPV varied between studies. In most studies, measures were used without appropriate cross-cultural validation and adaptation such that comparability of prevalence estimates has limitations.

The majority of the study populations were adults aged 18 and older, who were asked about IPV exposure in their own childhood. Research on other types of child maltreatment and family discord suggests that such retrospective data may be subject to recall bias, which can lead to a systematic under-estimation of the prevalence (26).

There is substantial variability in the tools and a lack of consensus about the domains that should be assessed in risk of bias assessments of prevalence studies (27). Although the interrater reliability was high in the present study and previous studies (10), we encountered possible limitations in the application of Hoy et al.'s risk of bias tool. Some dimensions, which can influence bias were not assessed. These include the sample size and the sampling procedure, which were not assessed in sufficient detail within a dichotomous format. Sampling techniques can still differ largely in terms of their representativeness. It was also not captured whether a sample was drawn from the entire population of a country or from a sub-national administrative entity. Underreporting of the applied research methods, which is common, can result in certain domains not being assessed, which can lead to a falsely elevated risk of bias rating.

Many of the estimates were collected from studies whose primary purpose was not the measurement of childhood exposure to IPV. We derived the estimates from general health surveys, such as Demographic and Health Surveys (DHS), studies on Adverse Childhood Experiences (ACE's), or from studies that assessed risk factors for other health conditions. If childhood exposure to IPV or child maltreatment was not reported in the abstract or the full text, the study would not have been identified, which could have led to a risk of bias at the review level.

Conclusion

We conclude that the exposure of children to IPV is highly prevalent in low-income and lower-middle-income countries. The pooled prevalence mirrors global estimates of IPV. From a large number of studies, including those performed in lower-income countries, we do know, that childhood exposure to IPV can lead to adverse consequences. Therefore, healthcare and social service providers should be alert to children being exposed to IPV in the home and the associated health consequences of such exposure.

We believe that the lack of consensus in defining and measuring childhood exposure to IPV is contributing to large variations in reported prevalence rates. Increased agreement about definitions and the operationalization of childhood exposure to IPV and consistent use of instruments would be a desirable step to improve measurement and compare outcomes.

The findings of this study strengthen the case for further efforts to address childhood exposure to IPV systematically, including in low-income and lower-middle-income countries. Considering the severe and long-lasting health and social consequences, the health sector, in collaboration with other sectors, plays an important role in raising awareness and addressing the consequences of children's exposure to IPV.

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Figure 1
PRISMA Flowchart of studies identified, included and excluded

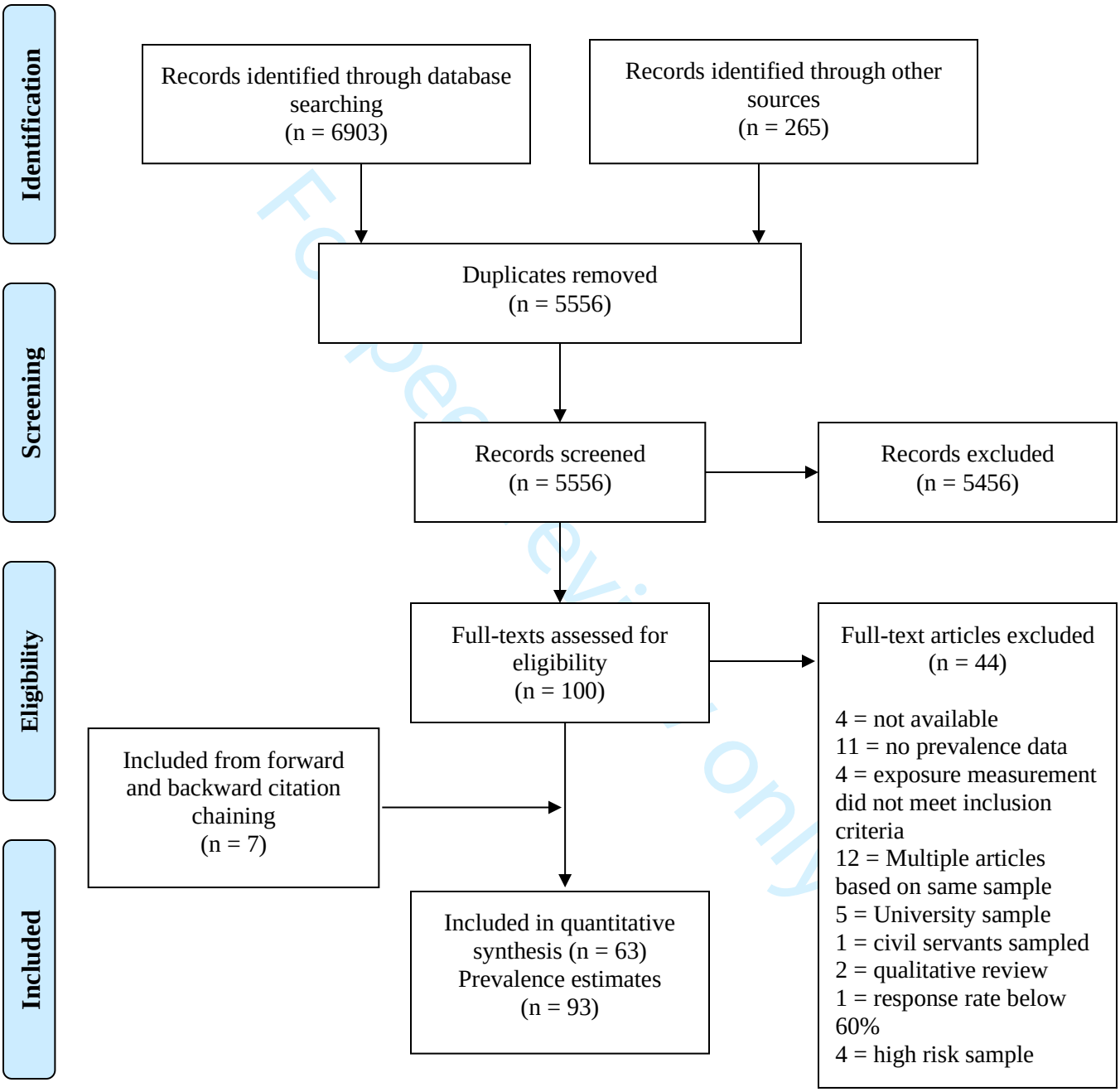


Figure 2

Box-plot of the lifetime prevalence of childhood exposure to IPV disaggregated by gender

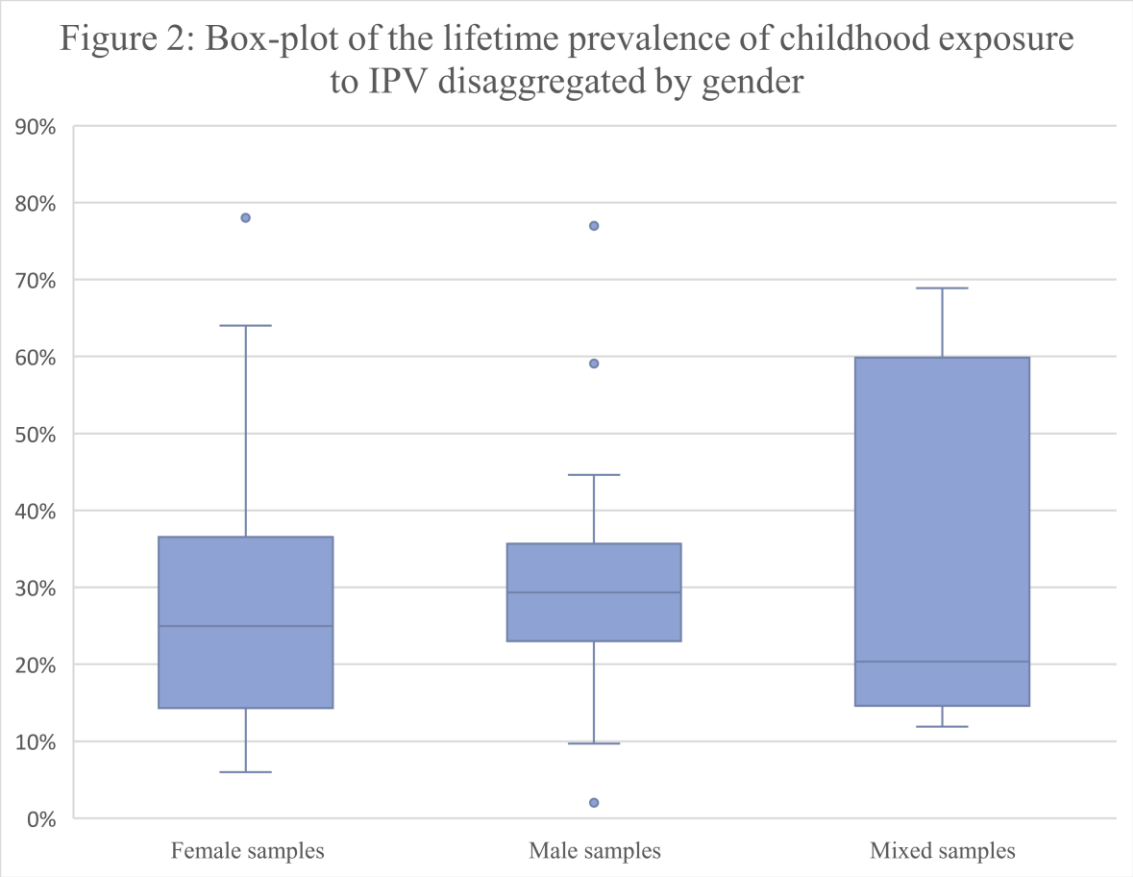
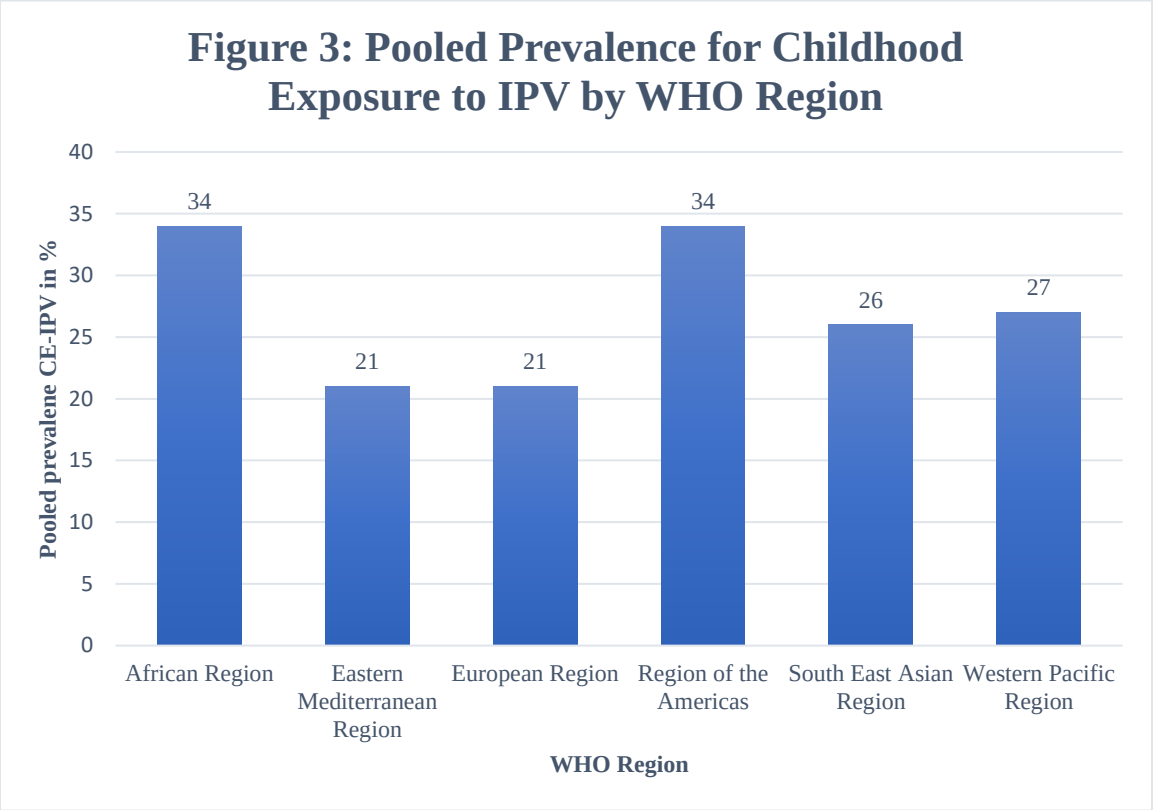


Figure 3

Pooled prevalence for childhood exposure to IPV in low-income and lower-middle income countries disaggregated by WHO region



Supplementary Material 1

Search strategy: Prevalence of childhood exposure to intimate partner violence in low-income and lower-middle-income countries: a systematic review and meta-analysis

1. Research questions

1) What is the lifetime prevalence of childhood exposure to IPV among children and adults in low-income and lower-middle-income countries?

2) What is the past-year prevalence of exposure to IPV among children in low-income and lower-middle-income countries?

3) What is the past-month prevalence of exposure to IPV among children in low-income and lower-middle-income countries?

2. Components of the search strategy as per protocol

1) Electronic databases: PubMed, Web of Science, WHO Global Index Medicus, CINAHL, ERIC, PsycINFO, Violence and Abuse Abstracts

2) Searches in specialized journals in particular Child Abuse and Neglect, Trauma, Violence & Abuse, Child Maltreatment.

3) Searches for relevant studies in the citations of other systematic reviews and meta-analyses.

4) Forward and backward citation chaining of included papers.

3. Global search strategy

prevalence OR epidemiol* OR cross-sectional OR survey

AND

child* OR adolescen* OR girls OR boys OR infant* OR baby OR babies OR toddler* OR preschool* OR pre-school* OR young person OR young people OR minor OR teen* OR youth*

AND

domestic violence OR parental violence OR intimate partner violence OR psychological abuse OR emotional abuse OR ((caregiver OR marital OR conjugal OR spous* OR husband OR wife OR women OR woman OR man OR men) AND (violence OR abuse OR victim* OR battered))

AND

witness* OR 'growing up' OR expos* OR poly-victimization OR poly-victimisation

4. Search strategy adapted for PubMed

PubMed Search using MeSH terms

(("Intimate Partner Violence"[Mesh] OR (("Domestic Violence"[Mesh] OR "Battered Women"[Mesh]) OR "Spouse Abuse"[Mesh])) AND (("Child"[Mesh] AND "Child, Preschool"[Mesh]) OR "Adolescent"[Mesh])) AND "Prevalence"[Mesh]

PubMed Search using Keywords

(prevalence) AND (((((child* OR adolescen* OR girl* OR boy* OR infant* OR baby OR babies OR toddler* OR preschool* OR pre-school* OR young person* OR young people OR minor* OR teen* OR adolescen* OR youth*))) AND (((domestic OR parental OR caregiver OR intimate partner OR marital OR conjugal OR spous* OR husband OR wife)) AND (violence OR abus* OR victim*))) AND ((witness* OR expos* OR growing up OR poly-victimisation OR poly-victimization)))

Combined PubMed Search using Keywords and MeSH terms

((((((("Intimate Partner Violence"[Mesh]) OR ((("Domestic Violence"[Mesh]) OR "Battered Women"[Mesh]) OR "Spouse Abuse"[Mesh]))) AND (("Child"[Mesh] AND "Child, Preschool"[Mesh]) OR "Adolescent"[Mesh])) AND "Prevalence"[Mesh])) OR ((prevalence) AND (((((child* OR adolescen* OR girl* OR boy* OR infant* OR baby OR babies OR toddler* OR preschool* OR pre-school* OR young person* OR young people OR minor* OR teen*))) AND (((domestic OR parental OR caregiver OR intimate partner OR marital OR conjugal OR spous* OR husband OR wife)) AND (violence OR abus* OR victim*))) AND ((witness* OR exposure OR growing up OR poly-victimisation OR poly-victimization))))

5. Search strategy adapted for Web of Science

Settings:

- Advanced search
- Web of Science Core Collection
- Timespan All years (1945-2019)

Note: Core Collection employs no **controlled vocabulary** or thesaurus in assigning subject terms. Natural language indexing (where every word in the title is searchable) is used.

Search strategy:

ALL FIELDS: (prevalence OR epidemiol* OR cross-sectional OR survey)

AND **ALL FIELDS:** (child* OR adolescen* OR girls OR boys OR infant* OR baby OR babies OR toddler* OR preschool* OR pre-school* OR young person OR young people OR minor OR teen* OR adolescen* OR youth*)

AND **ALL FIELDS:** (domestic violence OR parental violence OR intimate partner violence OR psychological abuse OR emotional abuse OR (caregiver OR marital OR conjugal OR spous* OR husband OR wife OR women OR woman OR man OR men) AND (violence OR abuse OR victim* OR battered))

AND **ALL FIELDS:** (witness* OR 'growing up' OR expos* OR poly-victimization OR poly-victimisation)

6. PsycINFO

Any Field: prevalence OR Any Field: epidemiol* OR Any Field: cross-sectional OR Any Field: survey AND Any Field: child* OR Any Field: adolescen* OR Any Field: girls OR Any Field: boys OR Any Field: infant* OR Any Field: baby OR Any Field: babies OR Any Field: toddler* OR Any Field: preschool* OR Any Field: pre-school* OR Any Field: young person OR Any Field: young people OR Any Field: minor OR Any Field: teen* OR Any Field: youth* AND Any Field: domestic violence OR Any Field: parental violence OR Any Field: intimate partner violence OR Any Field: psychological abuse OR Any Field: emotional abuse OR (Any Field: caregiver OR Any Field: marital OR Any Field: conjugal OR Any Field: spous* OR Any Field: husband OR Any Field: wife OR Any Field: women OR Any Field: woman OR Any Field: man OR Any Field: men) AND (Any Field: violence OR Any Field: abuse OR Any Field: victim* OR Any Field: battered)) AND Any Field: witness* OR Any Field: 'growing up' OR Any Field: exposure OR Any Field: expose* OR Any Field: poly-victimization OR Any Field: poly-victimisation

7. Global Index Medicus

(tw:(prevalence OR epidemiol* OR cross-sectional OR survey)) AND (tw:(child* OR adolescen* OR girls OR boys OR infant* OR baby OR babies OR toddler* OR preschool* OR pre-school* OR young person OR young people OR minor OR teen* OR youth*)) AND (tw:(domestic violence OR parental violence OR intimate partner violence OR psychological abuse OR emotional abuse OR ((caregiver OR marital OR conjugal OR spous* OR husband OR wife OR women OR woman OR man OR men) AND (violence OR abuse OR victim* OR battered)))) AND (tw:(witness* OR 'growing up' OR exposure OR expose* OR poly-victimization OR poly-victimisation)) AND (instance:"ghl")

Supplementary Material 3

Characteristics of studies included in meta-analysis

Author & Year	Country	National or sub-national sample	Gender	Age range / median age	Sample Source	Sampling procedure	Sample Size	CE-IPV Prevalence rate (%)	Type of witnessed violence	Reference frame	Risk of Bias
Abramsky 2011 (1)	Bangladesh	sub-national	female	15;49	household	two stage cluster sample	934	9%	physical	lifetime	low
Abramsky 2011 (1)	Bangladesh	sub-national	female	15;49	household	two stage cluster sample	1053	4%	physical	lifetime	low
Abramsky 2011 (1)	Ethiopia	sub-national	female	15;49	household	two stage cluster sample	1873	4%	physical	lifetime	low
Abramsky 2011 (1)	Peru	sub-national	female	15;49	household	two stage cluster sample	1008	0%	physical	lifetime	low
Abramsky 2011 (1)	Peru	sub-national	female	15;49	household	two stage cluster sample	746	7%	physical	lifetime	low
Abramsky 2011 (1)	Samoa	sub-national	female	15;49	household	two stage cluster sample	932	2%	physical	lifetime	low
Abramsky 2011 (1)	Tanzania	sub-national	female	15;49	household	two stage cluster sample	922	7%	physical	lifetime	low
Abramsky 2011 (1)	Tanzania	sub-national	female	15;49	household	two stage cluster sample	1169	9%	physical	lifetime	low
Abramsky 2011 (1)	Thailand	sub-national	female	15;49	household	two stage cluster sample	781	9%	physical	lifetime	low
Abramsky 2011 (1)	Thailand	sub-national	female	15;49	household	two stage cluster sample	848	6%	physical	lifetime	low
Alangea 2018 (2)	Ghana	sub-national	female	18;49	household	simple random	2000	4%	physical	lifetime	low
Alizzy 2017 (3)	Yemen	sub-national	female	11;16	school	simple random	303	3%	physical	lifetime	low
Alizzy 2017 (3)	Yemen	sub-national	male	11;16	school	simple random	295	4%	physical	lifetime	low
Ameli 2017 (4)	Malawi	sub-national	female	10;19	school	convenience sample	281	8%	physical and emotional	lifetime	moderate

Ameli 2017 (4)	Malawi	sub-national	male	10;19	school	convenience sample	280	0%	physical and emotional	lifetime	moderate
Amir-ud-Din 2018 (5)	Pakistan	national	female	15;49	household	multi-stage cluster sample	3265	1%	physical	lifetime	low
Antai 2016 (6)	Egypt	national	female	15;49	household	multi-stage cluster sample	4144	1%	physical	lifetime	low
Atiqul 2019 (7)	Bangladesh	sub-national	mixed	11;17	household	simple random	1416	0%	physical	lifetime	low
Atteraya 2015 (8)	Nepal	national	female	15;49	household	multi-stage cluster sample	3373	7%	physical	lifetime	low
Chirwa 2018 (9)	Ghana	sub-national	male	39.5	household	multi-stage cluster sample	1973	8%	physical	lifetime	low
Clark 2019 (10)	Nepal	sub-national	female	19;49	household	multi-stage cluster sample	1800	1%	physical	lifetime	low
Corboz 2018 (11)	Afghanistan	sub-national	female	14.3	school	simple random	420	7%	physical	past month	moderate
Corboz 2018 (11)	Afghanistan	sub-national	male	14.8	school	simple random	350	3%	physical	past month	moderate
Das 2014 (12)	India	sub-national	male	10;16	school	convenience sample	1040	2%	physical and emotional	lifetime	moderate
Deb 2016 (13)	India	sub-national	female	15;18	school	convenience sample	188	5%	physical and emotional	past year	moderate
Deb 2016 (13)	India	sub-national	male	15;18	school	convenience sample	182	2%	physical and emotional	past year	moderate
Devries 2017 (14)	Uganda	sub-national	female	11;14	school	stratified multi-stage cluster sample	1658	7%	physical and emotional	lifetime	low
Devries 2017 (14)	Uganda	sub-national	male	11;14	school	stratified multi-stage cluster sample	1572	7%	physical and emotional	lifetime	low
Dibaba 2008 (15)	Ethiopia	sub-national	female	31.8	community	simple random	308	4%	physical	lifetime	low
Fawole 2018 (16)	Nigeria	sub-national	mixed	10;21	school	stratified multi-stage cluster sample	640	0%	unclear	lifetime	moderate
Fleming 2015 (17)	Democratic Republic of the Congo	sub-national	male	18;59	household	random sample, stratified by age and province	539	4%	physical	lifetime	low

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Fleming 2015 (17)	Rwanda	sub-national	male	18;59	household	random sample, stratified by age and	1456	6%	physical	lifetime	low
Gage 2005 (18)	Haiti	national	female	15;49	household	two-stage stratified cluster sample	2564	2%	physical	lifetime	low
Gage 2015 (19)	Haiti	sub-national	female	>=14	school	convenience sample	187	9%	physical	lifetime	moderate
Gage 2015 (19)	Haiti	sub-national	male	>=14	school	convenience sample	155	0%	physical	lifetime	moderate
Gautam 2019 (20)	Nepal	national	female	15;49	household	multi-stage cluster sample	3562	4%	physical	lifetime	low
Goodman 2017 (21)	Kenya	sub-national	female	18;89	household	simple random	1966	8%	physical	lifetime	low
Hayati 2011 (22)	Indonesia	sub-national	male	15;49	household	multi-stage cluster sample	765	2%	physical	lifetime	low
Hayes 2018 (23)	Kyrgyz Republic	national	female	15;49	household	two-stage stratified cluster sample	3171	5%	physical	lifetime	low
Hayes 2018 (23)	Moldova	national	female	15;49	household	two-stage stratified cluster sample	3355	5%	physical	lifetime	low
Hayes 2018 (23)	Tajikistan	national	female	15;49	household	two-stage stratified cluster sample	3093	4%	physical	lifetime	low
Islam 2014 (24)	Bangladesh	national	female	15;49	household	stratified multi-stage cluster sample	3910	6%	physical	lifetime	low
Islam 2017 (25)	Bangladesh	national	male	18;54	household	stratified multi-stage cluster sample	3374	7%	physical	lifetime	low
James-Hawkins 2018 (26)	Bangladesh	sub-national	male	18;34	household	stratified multi-stage cluster sample	570	2%	physical	lifetime	low
Jeyaseelan 2004 (27)	Egypt	sub-national	female	15;49	household	simple random	631	6%	physical	lifetime	low
Jeyaseelan 2004 (27)	India (Lucknow)	sub-national	female	15;49	household	simple random	506	6%	physical	lifetime	low
Jeyaseelan 2004 (27)	India (Trivandru	sub-national	female	15;49	household	simple random	700	9%	physical	lifetime	low
Jeyaseelan 2004 (27)	India (Vellore)	sub-national	female	15;49	household	simple random	716	1%	physical	lifetime	low
Jeyaseelan 2004 (27)	Philippines	sub-national	female	15;49	household	simple random	1000	7%	physical	lifetime	low
Jirapramukpitak 2005 (28)	Thailand	sub-national	female	16;25	household	simple random	199	8%	physical	lifetime	low
Jirapramukpitak 2005 (28)	Thailand	sub-national	male	16;25	household	simple random	144	0%	physical	lifetime	low

Kinyanda 2013 (29)	Uganda	sub-national	mixed	3;19[1]	household	multi-stage cluster sample	1587	57%	physical and	lifetime	moderate
Kwagala 2013 (30)	Uganda	national	female	15;49	household	stratified multi-stage cluster sample	1307	2%	physical	lifetime	low
Laeheem 2009 (31)	Thailand	sub-national	mixed	8;11	school	random sample, stratified by school	1440	0%	physical	lifetime	low
Lakhdir 2017 (32)	Pakistan	sub-national	mixed	11;17	household	multi-stage cluster sample	800	5%	physical	lifetime	low
Le 2015 (33)	Vietnam	sub-national	mixed	16.5	school	two-stage stratified cluster sample	1606	2%	physical	lifetime	low
Lui 2018 (34)	Solomon Islands	sub-national	male	18;70	household	multi-stage cluster sample	400	7%	physical and emotional	lifetime	low
Mandal 2015 (35)	Philippines	sub-national	female	21;22	household	one-stage cluster sample	892	3%	physical	lifetime	low
Mandal 2015 (35)	Philippines	sub-national	male	21;22	household	one-stage cluster sample	989	6%	physical	lifetime	low
Martin 2002 (36)	India	sub-national	male	not reported	household	multi-stage cluster sample	6902	51%	physical	lifetime	low
Maxwell 2003 (37)	Philippines	sub-national	female	not reported	school	multi-stage cluster sample	685	0%	physical	past year	moderate
Maxwell 2003 (37)	Philippines	sub-national	male	not reported	school	multi-stage cluster sample	694	7%	physical	past year	moderate
Meekers 2013 (38)	Bolivia	national	female	15;49	household	multi-stage cluster sample	10119	4%	physical	lifetime	low
Ndetei 2007 (39)	Kenya	sub-national	mixed	12;26	school	convenience sample	1110	7%	unclear	lifetime	moderate
Neupane 2018 (40)	Nepal	sub-national	mixed	12;18	school	cluster-sample	962	9%	unclear	lifetime	low
Neupane 2018 (40)	Nepal	sub-national	mixed	12;18	school	cluster-sample	962	7%	unclear	past year	low
Ogum 2018 (41)	Ghana	sub-national	female	18;49	household	multi-stage stratified cluster sample	2000	4%	physical	lifetime	low
O'Leary 2008 (42)	Ukraine	national	female	46 (median	household	multi-stage cluster sample	558	7%	physical and	lifetime	low
O'Leary 2008 (42)	Ukraine	national	male	46 (median	household	multi-stage cluster sample	558	2%	physical and	lifetime	low
Onigbogi 2015 (43)	Nigeria	sub-national	female	18;65	household	multi-stage cluster sample	400	9%	physical	lifetime	low

Owusu 2016 (44)	Ghana	national	female	15;49	household	multi-stage cluster sample	1524	2%	physical	lifetime	low
Pallitto 2008 (45)	El Salvador	national	female	15;24	household	multi-stage probabilistic random sample	3753	6%	physical	lifetime	low
Panter-Brick 2011 (46)	Afghanistan	sub-national	mixed	11;16	school	stratified random sample	234	7%	physical	past year	low
Ramiro 2010 (47)	Philippines	sub-national	female	46.7	household	simple random	533	4%	physical	lifetime	low
Ramiro 2010 (47)	Philippines	sub-national	male	46.7	household	simple random	535	2%	physical	lifetime	low
Reese 2017 (48)	Tanzania	national	female	15;49	household	two-stage cluster sample	4975	1%	physical	lifetime	low
Sabri 2014 (49)	India	national	female	15;49	household	nationally representative	67226	0%	physical	lifetime	low
Solanke 2018 (50)	Nigeria	national	female	15;49	household	stratified three-stage cluster sample	19924	8%	physical	lifetime	low
Speizer 2010 (51)	Uganda	national	female	15;49	household	multi-stage cluster sample	1749	8%	physical	lifetime	low
Speizer 2010 (51)	Uganda	national	male	14;54	household	multi-stage cluster sample	1318	9%	physical	lifetime	low
Tenkorang 2013 (52)	Ghana	national	female	15;45	household	two-stage cluster sample	1835	3%	physical	lifetime	low
Tenkorang 2018 (53)	Ghana	national	female	38	household	two-stage cluster sample	2289	6%	unclear	lifetime	low
Thomson 2015 (54)	Rwanda	national	female	15;49	household	two-stage cluster sample	4066	2%	physical	lifetime	low
Tiruneh 2018 (55)	Democratic Republic of the Congo	national	female	15;49	household	stratified two-stage cluster sample	5120	7%	physical	lifetime	low
Tran 2017 (56)	Vietnam	sub-national	female	12;17	school	cluster-sample	975	4%	physical	lifetime	low
Tran 2017 (56)	Vietnam	sub-national	male	12;17	school	cluster-sample	876	3%	physical	lifetime	low
Uthman 2011 (57)	Nigeria	national	female	20;44	household	two-stage cluster sample	8731	0%	physical	lifetime	low
VanderEnde 2016 (58)	Malawi	national	male	18;24	household	four-stage cluster sample	447	2%	physical	lifetime	low
Vung 2009 (59)	Vietnam	sub-national	female	17;60	household	stratified cluster sample	730	6%	physical	lifetime	low

Wahdan 2014 (60)	Egypt	sub-national	mixed	11;19	household	multi-stage cluster sample	783	41%	physical	lifetime	low
Yount 2016 (61)	Vietnam	sub-national	female	18;50	household	cluster-sample	533	36%	physical	lifetime	low
Yount 2016 (62)	Vietnam	sub-national	male	18;51	household	cluster-sample	522	17%	physical	lifetime	low
Yount 2018 (63)	Bangladesh	sub-national	male	18;49	household	cluster-sample, probability	1508	9%	physical	lifetime	low

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PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	3
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	1
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	3
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS). *Note: Systematic review of prevalence, interventions and comparisons n.a.*	3
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	1 and 4
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	4
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	4
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Suppl. 2
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	4
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	5
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	3/4
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	5/6
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	3/4
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	6

PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	5
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	7
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	Figure 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	Suppl. 3
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	Suppl. 3
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	Suppl. 3
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	7
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	n/a
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	7
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	7/8
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	10
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	10
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	Cover page

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

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Prevalence of childhood exposure to intimate partner violence in low-income and lower-middle-income countries: a systematic review and meta-analysis

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Authors' contributions: BK developed the research questions and conducted the searches. BK and MK screened the papers for inclusion and extracted the data for the analysis. MK provided detailed guidance throughout the review process. BK performed the data analysis. TP provided advice on research methods and verified the analytical methods. BK took the lead in writing the manuscript. All authors provided critical feedback and helped shape the research, analysis and draft manuscript. TP and HM provided overall guidance and supervision.

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Abstract

Objective

To determine the proportion of children in low-income and lower-middle-income countries exposed to intimate partner violence.

Design

Systematic review and meta-analysis

Data sources

PubMed, CINAHL, ERIC, PsycINFO, Web of Science, WHO Global Index Medicus, and Violence and Abuse Abstracts, hand searching of specialized journals from inception until 19 May 2019.

Eligibility Criteria for selecting studies

Primary quantitative studies that included a measure of self-reported exposure to intimate partner violence (IPV) prior to age 18 and were conducted in low-income and lower-middle-income countries.

Data extraction and Synthesis

Data were screened, extracted and appraised by two independent reviewers. The prevalence estimates were pooled using a random-effects model. Outcomes included lifetime and past-year prevalence of childhood exposure to IPV. Meta-regression was used to explore heterogeneity. Publication bias was assessed using a funnel plot and Egger's regression test. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed.

Results

Sixty-two studies were included, enrolling 231 512 participants. 85 lifetime prevalence estimates and 6 estimates of past-year prevalence were available for synthesis. The overall random-effects pooled lifetime prevalence of childhood exposure to IPV was 29% (95% CI: 26%; 31%). The pooled past-year prevalence in children was 35% (95% CI: 21%; 48%). The lifetime prevalence disaggregated by WHO regions ranged from 21% to 34%. There were no statistical differences in prevalence estimates from samples of men and women.

Conclusion

We found about a third of children worldwide have been exposed to IPV. The heterogeneity between estimates was large and was not explained by available study and sample characteristics. Our findings indicate that children's exposure to IPV in low-income and lower-middle-income countries is a major public health issue.

Data availability statement

All data relevant to the study are included in the article or uploaded as online supplemental information.

Prospero registration number

CRD42019119698

Keywords: prevalence, intimate partner violence, domestic violence, child witness, childhood exposure to intimate partner violence

Strengths and limitations of this study

- This is the first systematic review and meta-analysis assessing the prevalence of childhood exposure to intimate partner violence in low-income and lower-middle-income countries.
- A large number of eligible articles were screened and included in the review.
- The systematic review responds to a policy-relevant priority identified by stakeholders from low-income and lower-middle-income countries.
- The lack of consensus around the definitions and measures of exposures makes it challenging to derive a global prevalence figure for low-income and lower-middle-income countries.
- Only published studies were included in the systematic review and meta-analysis. Unpublished data and data from government or NGO-reports were excluded.

Prevalence of childhood exposure to intimate partner violence in low-income and lower-middle-income countries: a systematic review and meta-analysis

Introduction

Intimate partner violence (IPV) is a serious human rights and public health problem globally. Worldwide, one in three women is affected by IPV (1). Although less studied, IPV can also affect men and individuals with other gender identities. Such violence often takes place in the presence of children and can have severe and long-lasting impact on children's health and development.

Childhood exposure to IPV includes either the direct observation or mere awareness without directly seeing or hearing violent acts or abuse between caregivers, who are current or former spouses or intimate partners (2, 3). Such awareness can include the child seeing some of the immediate consequences or overhearing a conversation about the violent act, experiencing life changes as a consequence of violence (for example separation from a parent), or intervening directly in an attempt to stop the violent act (4). Childhood exposure to IPV has been associated with a broad range of physical and mental health problems, health risk behaviours and social consequences. These effects vary depending on age and developmental stage of the child at the time of exposure, as well as factors such as duration and severity, and overlap with other types of maltreatment (5,6). Mental health consequences include increased risk for depression, anxiety, conduct disorder, adjustment problems and posttraumatic stress disorder (7, 8). IPV exposure has also been associated with reduced cognitive ability and educational achievement (9). Witnessing IPV in childhood is consistently identified as risk factor for perpetrating and experiencing IPV in adulthood (10,11). Children exposed to IPV have a higher likelihood of engaging in health risk behaviours including tobacco use, the harmful use of alcohol, substance use or unsafe sex (12), which partly explain the association between childhood exposure to IPV and persisting health outcomes including the contraction of HIV or other sexually transmitted infections, reproductive health problems, and non-communicable diseases, including cardiovascular disease, cancer, and diabetes (13). An increasing number of studies indicates that violence-associated toxic stress can affect brain structures, as well as the endocrine and nervous systems (14,15). However, the relationship between childhood exposure to IPV and long-term health outcomes is complex, not definitive, and often moderated by socio-economic status (16).

Despite the widespread nature of IPV and its severe consequences for children, major gaps remain in estimating the prevalence of childhood exposure to IPV. Retrospective studies from high-income countries show that 8-25% of children are exposed to IPV in their home (2). To our knowledge, no systematic review or meta-analysis has attempted to synthesize existing prevalence studies of childhood exposure to IPV from low-income and lower-middle-income countries. In recent years, however, primary prevalence studies have become available and data have been collected in the context of general health surveys or surveys directly focused on violence and abuse (17,18). Increased knowledge about the burden of children's exposure to IPV can help to better assess the broader impact of IPV, its potential effects on child health, and the implications for service provision.

To address the need for a global overview of prevalence estimates from lower-income economies, we conducted a systematic review and meta-analysis of existing estimates of prevalence of children's exposure to IPV from low-income and lower-middle-income countries around the world.

Methods

Research questions and outcome variables

This systematic review addresses the following research questions: 1. What is the lifetime prevalence of childhood exposure to IPV among children and adults in low-income and lower-middle-income countries? 2. What is the past-year prevalence of exposure to IPV among children in low-income and lower-middle-income countries?

The outcome of interest, childhood exposure to IPV, was defined as direct observation or awareness of violence between caregivers who are current or former spouses or intimate partners (2, 3). Intimate partner violence refers to behaviour by an intimate partner or ex-partner that causes physical, sexual or psychological harm, including physical aggression, sexual coercion, psychological abuse and controlling behaviours (18). To determine lifetime prevalence, relevant studies included data collected from adults, who reported exposure to IPV at any point in their lives up to the age of 18 years, and children, who reported exposure to IPV at any point in their lives up to the time of the survey.

The study followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines (**Supplementary Material 1**). A protocol for this review was registered at PROSPERO Registry of the Centre for Reviews and Dissemination of the University of York (https ://www.crd.york.ac.uk/PROSPERO; ID:CRD 42019119698).

Literature Search Strategy

A four-step search strategy was applied to identify relevant studies. First, we searched seven electronic databases: PubMed, CINAHL (EBSCOhost), ERIC (ProQuest), PsycINFO (ProQuest), Web of Science, WHO Global Index Medicus, and Violence and Abuse Abstracts (EBSCOhost). A search strategy was developed for each database using a combination of free text and controlled vocabulary and was reviewed by a PhD-trained information scientist with extensive experience in systematic review methodology and systematic reviews focused on exposure to various types of interpersonal violence, including childhood exposure to IPV. All papers published until 19 May 2019 were considered. Searches were conducted in English language but no language restrictions were placed on the search results.

The search terms include combinations and iterations of "prevalence", "childhood", "intimate partner violence" and "exposure" or "witnessing". The full search strategy for each database is available in **Supplementary Material 2**. Searches for each database were evaluated against a sub-sample of ten papers that were predetermined by the research team to meet the inclusion criteria (19).

Database searches were supplemented by hand searches of specialized journals focused on interpersonal violence, which were conducted in May 2019. The journals included *Child Abuse & Neglect*, *Child Maltreatment*, and *Trauma, Violence & Abuse*. Forward and backward citation chaining of included papers was conducted from April until May 2020 to capture any papers potentially missed by database searches and which may have been published up until the submission of this manuscript for publication.

Eligibility Criteria

We included primary quantitative studies that measured the prevalence of current and past exposure to IPV prior to the age of 18. Male, female and mixed-sex1 samples from low-income and lower-middle-income countries according to World Bank country and lending classification (as of October 2019) were considered (20). Samples collected at national or sub-national levels were eligible. Data from both household surveys and school surveys were considered. The survey response rate had to be above 60%.

Title and Abstract Screening, Full-Text Screening, and Data Extraction

Titles and abstracts of all articles identified via the search strategy were screened by one reviewer (BK). A sample (5%) of the total records was screened by a second reviewer (MK) to check the consistency of the application of the inclusion/exclusion criteria. Disagreements were resolved through discussion and involvement of a third reviewer (HM). The interrater reliability was substantial with Cohen's Kappa k=0.74.

At the second stage, 104 full texts were assessed for eligibility by one reviewer (BK) applying the checklist with inclusion/exclusion criteria. A subset (20%) of the full texts was assessed by a second reviewer (MK). The agreement between the reviewers was substantial with Cohen's Kappa k=0.74.

A standardized template was created for data extraction. The main variables included study information, characteristics of the sample, study methodology (study type, sampling method, survey item, mode of data collection), and prevalence estimates. Data extraction for all included studies was conducted by one reviewer (BK). Twenty papers underwent independent data extraction by a second reviewer (MK). There was perfect agreement on the extraction of study information, including prevalence estimates, across reviewers.

Quality Assessment and Assessment of Bias

Study quality was assessed during the data extraction process using a standardized risk of bias tool for prevalence studies (Table 1) adapted from Hoy et al. (21). The nine items cover different aspects of external and internal validity. Two reviewers (BK and MK) classified each of the items describing potential sources of bias into low risk or high risk. A summary score was then calculated by adding all the items rated high risk. A summary score of 0 – 3 is considered low risk, 4 - 6 moderate risk, and a score of 7 - 9 indicates the study is at high risk of bias. Studies with low and moderate risk of bias were included in the meta-analysis.

We assessed publication bias using a funnel plot and Egger's regression test (22).

Table 1 Risk of Bias assessment (adapted from Hoy et al., 2012)

External validity (maximum score=4)
Was the study's target population a close representation of the national population in relation to relevant variables such as age, sex, occupation, urban/rural population? (Yes: low risk=0 points; no: high risk=1 point)
Was the sampling frame a true or close representation of the target population (household sample and/or primary school sample)?

[1] Some surveys use biological sex and some surveys use the term gender.

(Yes: low risk=0 points; No: high risk=1 points)
Was some form of random selection used to select the sample, or was a census undertaken? (Yes: low risk=0 points; no: high risk=1 point)
Was the likelihood of non-response bias minimal (Response rate >= 75% or explicitly stated that there was no difference between responders and non-responders)? (Yes: low risk=0 points; no: high risk=1 point)
Internal validity (maximum score=5)
Were data collected directly from the subjects (as opposed to a proxy)? (Yes: low risk=0 points; no: high risk=1 point)
Was an acceptable case definition used in the study? Where subjects asked whether they witnessed or were aware of physical, sexual or emotional violence between their caregivers? (Yes: low risk=0 points; no: high risk=1 point)
Was the study instrument that measured the parameter of interest shown to have reliability and validity (item derived from an instrument that had widely been tested for reliability or validity, or explicitly stated that validity has been measured)? (Yes: low risk=0 points; no: high risk=1 point)
Was the same mode of data collection used for all subjects? (Yes: low risk=0 points; no: high risk=1 point)
Were the numerator(s) and denominator(s) for the parameter of interest appropriate? (Yes: low risk=0 points; no: high risk=1 point)

Data Synthesis

A meta-analysis was performed to synthesize the lifetime and past-year prevalence of childhood exposure to IPV. Prevalence rates were calculated from raw proportions or percentages reported in the included studies. Pooled prevalence estimates were determined for lifetime and past-year prevalence. The prevalence estimates were disaggregated by gender, wherever this information was available. Studies that did not disaggregate by gender were included in the category "mixed samples". When studies provided different estimates for exposure to physical violence and emotional violence for the same sample, we chose "physical violence", as this was the measurement applied by the majority of the studies. All analyses were done with METAPROP in STATA 14.0 designed to perform meta-analyses of proportions. The programme computes 95% confidence intervals using the score statistic and the exact binomial method and incorporates the Freeman-Tukey double arcsine transformation of proportions (23). The overall prevalence estimates were pooled based on a random-effects model, which takes into account that observed differences between proportions cannot be entirely attributed to the sampling error and that other factors such as true differences between study populations and methodologic differences can also contribute. Weights were applied according to the inverse of the variance. Given that within-study variance was relatively small and the variance between studies was substantial, the weights were similar across all studies. 95% CIs were calculated around the pooled estimates. To assess the extent of variation between studies, heterogeneity tests with the I^2 statistic were performed.

No pre-specified stratified analyses were planned for this study. Additional analyses and visual inspection of the data were conducted post hoc, following the observation of the high heterogeneity of the prevalence estimates.

Patient and public involvement

Not applicable. We performed a systematic review and meta-analysis on published data.

Results

A total of 6903 records were obtained through database searching and 265 additional records through hand searches. After duplicates were removed, 5556 titles and abstracts were screened for their relevance. This first screening resulted in 100 potentially eligible studies, which were then screened using the full text of the article. After full-text screening, 55 studies were identified for inclusion in the review. Main reasons for exclusion were that several papers were published using data from the same sample or did not provide prevalence estimates. Detailed reasons for exclusion are provided in the PRISMA diagram (**Figure 1**). If several publications drew on data from the same study, the study that provided the most information, was selected. Forward and backward citation chaining of included studies yielded another seven eligible articles, so that a total of 62 studies were included in the review (**Supplementary Material 3**). According to the risk of bias assessment (21) eight studies were classified as moderate risk of bias, and 54 studies were classified as low risk of bias. No studies had to be excluded based on the risk of bias assessment. Some of these studies are multi-country studies, or they disaggregated data collection by males and females, so that the total number of available prevalence estimates is 91.

We retrieved studies from 29 low- and lower-middle income countries with data from 231 512 individuals. Twenty-seven estimates were based on data from representative national surveys and 64 estimates were based on data from sub-national administrative units such as regions or districts. Almost all studies reported applying a form of random sampling (k= 57); 5 studies used convenience samples. The included studies yielded 85 estimates for lifetime prevalence of childhood exposure to IPV and six estimates on past-year prevalence. Sixty-eight prevalence estimates were determined from household sample data; 22 prevalence estimates were based on data from school-based samples and one prevalence estimate were based on data collected in public institutions in the community. Most studies measured exposure to physical IPV between caregivers (k=55), seven studies measured exposure to physical and emotional IPV. Twenty-two studies operationalized exposure to physical IPV between caregivers as bi-directional violence, and 45 studies explicitly asked whether IPV was perpetrated by the father against the mother.

The overall random-effects pooled lifetime prevalence of childhood exposure to IPV across all samples (n=85) was 29% (95% CI: 26%; 31%) with a high level of heterogeneity across studies (I^2=99.67%, p<0.001 ; T^2=0.02). Lifetime prevalence estimates ranged from a minimum of 2% to a maximum of 78%, with an interquartile range from 16% to 37% and a median of 26%. The pooled past-year prevalence (n=6) was 35% (95% CI: 21%; 48%) with similarly high levels of heterogeneity (I^2=98.3%, p<.001; T^2=0.03). The past-year prevalence estimates spread from 12% to 57%. The interquartile range reached from 22% to 49% with a median prevalence of 34%.

The lifetime prevalence in studies that involved either male or female samples or provided a gender breakdown (n=76) was 27% (95% CI: 23%; 30%) for females and 31% (95% CI 25%; 38%) for males. Minimum and maximum values and quartiles for female, male and mixed samples are shown in **Figure 2**. The past-year prevalence (n=4) was 29% (95% CI 26%, 32%) for females and 28% (95% CI 25%, 31%) for males. The difference between female, male and mixed samples was not statistically significant for lifetime (p=.39) or for past-year prevalence (p=.66).

To explore the sources of heterogeneity, sample size, median age of the sample, risk of bias rating, geographical region and data collection method (household, school) were entered into a meta-regression. None of the independent variables was statistically significantly associated with prevalence.

The funnel plot was asymmetric, whereby asymmetry was caused by smaller studies that tended to give results emphasizing higher prevalence rates. Egger's regression test was significant (p=0.03). We applied

the trim and fill method to calculate whether potential publication bias had an impact on the pooled prevalence estimates (24). Seven additional studies were imputed, but they did not change the summary estimate.

The global and WHO regional prevalence estimates for childhood exposure to IPV are shown in **Figure 3**. The pooled prevalence in low-income and lower-middle-income countries in the South East Asian Region (SEARO), based on 23 samples, was 26% (95% CI: 21%; 30%), in the African Region (AFRO) 34% (95% CI: 27%;40%) based on 30 samples, in the Region of the Americas (PAHO) 34% (95% CI: 19%;49%) based on seven samples, in the Western Pacific Region (WPRO) 27% (95% CI: 20%;34%) based on 13 samples, in the Eastern Mediterranean Region (EMRO) 21% (95% CI: 15%;26%), based on seven samples, and in low-income and lower-middle-income countries from the European Region (EURO) 21% (95% CI: 12%;29%) based on 5 samples. The heterogeneity between geographical regions was statistically significant (p=0.04).

Discussion

We used meta-analytical methods to pool prevalence estimates of childhood exposure to IPV, which were reported in 62 studies, citing results of 91 samples from low-income and lower-middle-income countries. The average pooled lifetime prevalence was 29% (past-year prevalence: 35%), so almost one in three individuals reported being exposed to IPV during their childhood. Based on 2019 population estimates (25), this amounts to 117 million children in low-income and lower-middle-income countries who reported exposure to IPV. We found high levels of heterogeneity across studies. The median prevalence of the studies we reviewed was 26%, with an interquartile range between 16% and 37% for the lifetime prevalence of childhood exposure to IPV.

To our knowledge there has not been a systematic review of the global prevalence of children's exposure to IPV in low-income or lower-middle income countries. A review of child maltreatment from high-income countries (26) has shown that 8 to 25% of children witnessed IPV. A review from high- and middle-income countries in the Asia Pacific Region (27) reported that 10-39% of children were exposed to IPV. Given the heterogeneity of the estimates that is also found in the studies conducted in high income countries, it would be premature to draw conclusions about the relationship between the socio-economic status of the country and childhood exposure to IPV. Poorer economies are potentially less able to invest in social welfare programmes and law enforcement tends to be underfunded, which is likely to be associated with higher levels of IPV. Results from several studies show that economic policies that contribute to reductions in household income and increased financial uncertainty are associated with increases in maltreatment (28).

Childhood exposure to IPV is still not receiving attention at a level that is similar to other forms of violence, although the topic has gained visibility in recent years. It often falls in between the gaps of constituencies that primarily address violence against children and those that address violence against women. This is also reflected in international agreements. While physical, psychological and sexual abuse of women and physical and sexual abuse of children are explicitly addressed in the targets of the 2030 Agenda for Sustainable Development, which has been adopted by all United Nations Member States in 2015, the international community did not take into account that these forms of violence are often linked and that violence against women can also have detrimental effects on children.

Statistically significant differences were found between WHO regions. Childhood exposure to IPV was highest in the Americas and the African Region and lowest in low-income countries of the European

Region and the Eastern Mediterranean Region. Factors that could explain the variance between regions include true differences in prevalence influenced by culture-specific social or gender-norms that affect the frequency of occurrence of IPV, whether IPV is occurring in front of children or concealed from children, or the social acceptability for children to admit to being exposed to IPV. Since the items assessing exposure to IPV were not validated across cultural settings, differences in the understanding of the semantic content across cultures could also have affected the differences found between WHO regions.

Although we found prevalence estimates from almost half of the countries that are classified as low-income and lower-middle-income countries, prevalence studies seem to be sparse in large parts of Africa, Maghreb, in countries with civil war and conflict, and in countries with small populations. This can only partially be explained by the fact that we only considered papers that were published in certain languages.

Similar to findings from surveys from high income countries, we did not find statistically different prevalence estimates between male and female samples (29, 30). This appears surprising, as in many societies, especially when traditional gender norms persist, girls tend to spend on average more time at home than boys (31).

High heterogeneity seems to be a shared feature of prevalence reviews on children's exposure to IPV (26, 27) and on other types of violence against children (32-34). The large variance we found is likely associated with common methodological issues related to how prevalence estimates are derived or due to a true variability of exposure to IPV. We did not find that study characteristics such as the sample size, the median age of the sample, the risk of bias rating or the setting in which data was collected could explain the heterogeneity. There are few analyses of how study characteristics influence prevalence in child maltreatment research, and none in the area of childhood exposure to IPV. Meta-analyses in other areas of child maltreatment prevalence research found that less rigorous sampling strategies and smaller sample sizes were associated with higher prevalence estimates (34,35).

There are several strengths of this systematic review and meta-analysis. It is the first study to synthesize existing prevalence data on childhood exposure to IPV from low-income and lower-middle-income countries. Although measurement issues make it difficult to derive a global prevalence figure, results of our review indicate that children's exposure to IPV is a very important public health problem across countries.

Research implications of findings

The large heterogeneity between studies found in our study and in other studies on the victimization of children highlights the importance of further research to identify and address the sources of such large variance. It would be important to establish to what extent the heterogeneity is due to real variations in childhood exposure to IPV and to what extent it is a methodologic artefact.

Future research would thereby benefit from clear definitions of childhood exposure to IPV. Several researchers have stressed the importance of comprehensive measurement of children's exposure to IPV(36).

Although there is some congruence in the measurement instruments used to assess the prevalence of childhood exposure to IPV, there is still no gold standard. It remains to be determined whether the various instruments that are applied are comparable. To improve the accuracy and comparability of items that measure childhood exposure to IPV, instruments should at least specify the type of IPV exposure (physical, emotional, sexual), and in what way the child was exposed (e.g. as a direct observer, having overheard someone talk about the abuse, having direct involvement, experiencing negative consequences from abuse in the home).

Few surveys use a similar methodology across countries. A global research effort involving systematic approaches to measuring childhood victimization would provide important epidemiological information that could assist prevention and intervention efforts.

Practice and policy implications

Our findings show that children's exposure to IPV is widespread in low-income and lower-middle-income countries. Given that childhood exposure to IPV is linked to a range of physical and mental health problems, health risk behaviours and social consequences (7-15,37) including in low-income countries (38), healthcare and social service providers should consider the impact that IPV has on children, when providing care and services to victims of IPV.

Services for child and adult victims of IPV are commonly not delivered in an integrated manner. Policy makers should invest in the development of integrated interventions for IPV and evaluate whether they lead to better health outcomes for children, particularly in settings with limited human and financial resources.

The study highlights the importance of investing in the primary prevention of IPV. Reducing IPV has the potential to reduce negative health outcomes among children living in households with IPV. Systematically implementing policies to target major risk factors for intimate partner violence, such as strengthening access to education for girls and economic empowerment of women has proven to be effective in reducing IPV (39).

Limitations

Given the large heterogeneity across studies, we recommend caution in drawing conclusions about a global estimate for childhood exposure to IPV. The pooled estimate of the random effects model cannot be interpreted as universal true effect; rather it is the average of survey-specific estimates.

The items that were used to measure childhood exposure to IPV varied between studies. In most studies, measures were used without appropriate cross-cultural validation and adaptation such that comparability of prevalence estimates has limitations.

The majority of the study populations were adults aged 18 and older, who were asked about IPV exposure in their own childhood. Research on other types of child maltreatment and family discord suggests that such retrospective data may be subject to recall bias, which can lead to a systematic under-estimation of the prevalence (40).

There is substantial variability in the tools and a lack of consensus about the domains that should be assessed in risk of bias assessments of prevalence studies (41). Although the interrater reliability was high in the present study and previous studies (21), we encountered possible limitations in the application of Hoy et al.'s risk of bias tool. Some dimensions, which can influence bias were not assessed. These include the sample size and the sampling procedure, which were not assessed in sufficient detail. Sampling techniques can still differ largely in terms of their representativeness. It was also not captured whether a sample was drawn from the entire population of a country or from a sub-national administrative entity. Underreporting of the applied research methods, which is common, can result in certain domains not being assessed, which can lead to a falsely elevated risk of bias rating.

Many of the estimates were collected from studies whose primary purpose was not the measurement of childhood exposure to IPV. We derived the estimates from general health surveys, such as Demographic and Health Surveys (DHS), studies on Adverse Childhood Experiences (ACE's), or from studies that

assessed risk factors for other health conditions. If childhood exposure to IPV or child maltreatment was not reported in the abstract or the full text, the study would not have been identified, which could have led to a risk of bias at the review level.

Conclusion

We conclude that the exposure of children to IPV is highly prevalent in low-income and lower-middle-income countries. The pooled prevalence mirrors global estimates of IPV. From a large number of studies, including those performed in lower-income countries, we do know, that childhood exposure to IPV can lead to severe and long-lasting health and social consequences. Therefore, healthcare and social care providers should be able to recognize child exposure to IPV, provide first line support, including psychosocial support, address associated mental health consequences and link exposed children with other support services to prevent subsequent impairment.

We believe that the lack of consensus in defining and measuring childhood exposure to IPV is contributing to large variations in reported prevalence rates. Increased agreement about definitions and the operationalization of childhood exposure to IPV and consistent use of instruments would be a desirable step to improve measurement and compare outcomes.

The findings of this study strengthen the case for further efforts to address childhood exposure to IPV systematically, including in low-income and lower-middle-income countries. Considering the severe and long-lasting health and social consequences, the health sector, in collaboration with other sectors, plays an important role in raising awareness and addressing the consequences of children's exposure to IPV.

Contributorship statement

BK developed the research questions. All authors made substantial contributions to the research protocol. BK conducted the searches. BK and MK screened the papers for inclusion and extracted the data for the analysis. MK provided detailed guidance throughout the review process. BK performed the data analysis. TP provided advice on research methods and verified the analytical methods. BK took the lead in writing the manuscript. All authors provided critical feedback and helped shape the research, analysis and draft manuscript. TP and HM provided overall guidance and supervision. All authors approved the final version of the manuscript and agree to be accountable for all aspects of the work and ensure that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Competing interests

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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Data availability statement

All data relevant to the study are included in the article or uploaded as online supplemental information.

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Figure legends/captions

Figure 1: PRISMA Flowchart of studies identified, included and excluded

Figure 2: Box-plot of the lifetime prevalence of childhood exposure to IPV disaggregated by gender

Figure 3: Pooled prevalence for childhood exposure to IPV in low-income and lower-middle income countries disaggregated by WHO region

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Figure 1
PRISMA Flowchart of studies identified, included and excluded

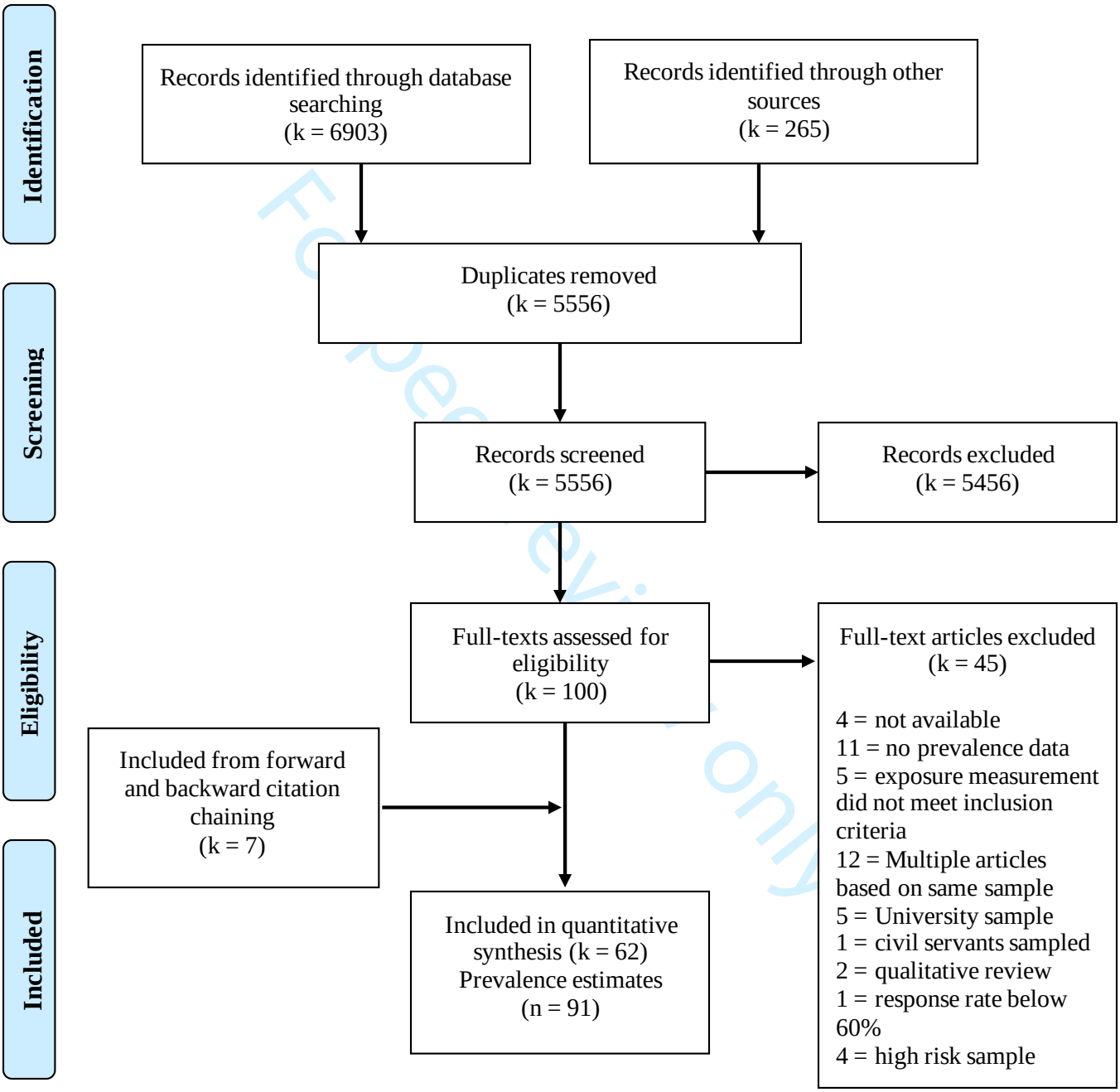


Figure 2

Box-plot of the lifetime prevalence of childhood exposure to IPV disaggregated by gender

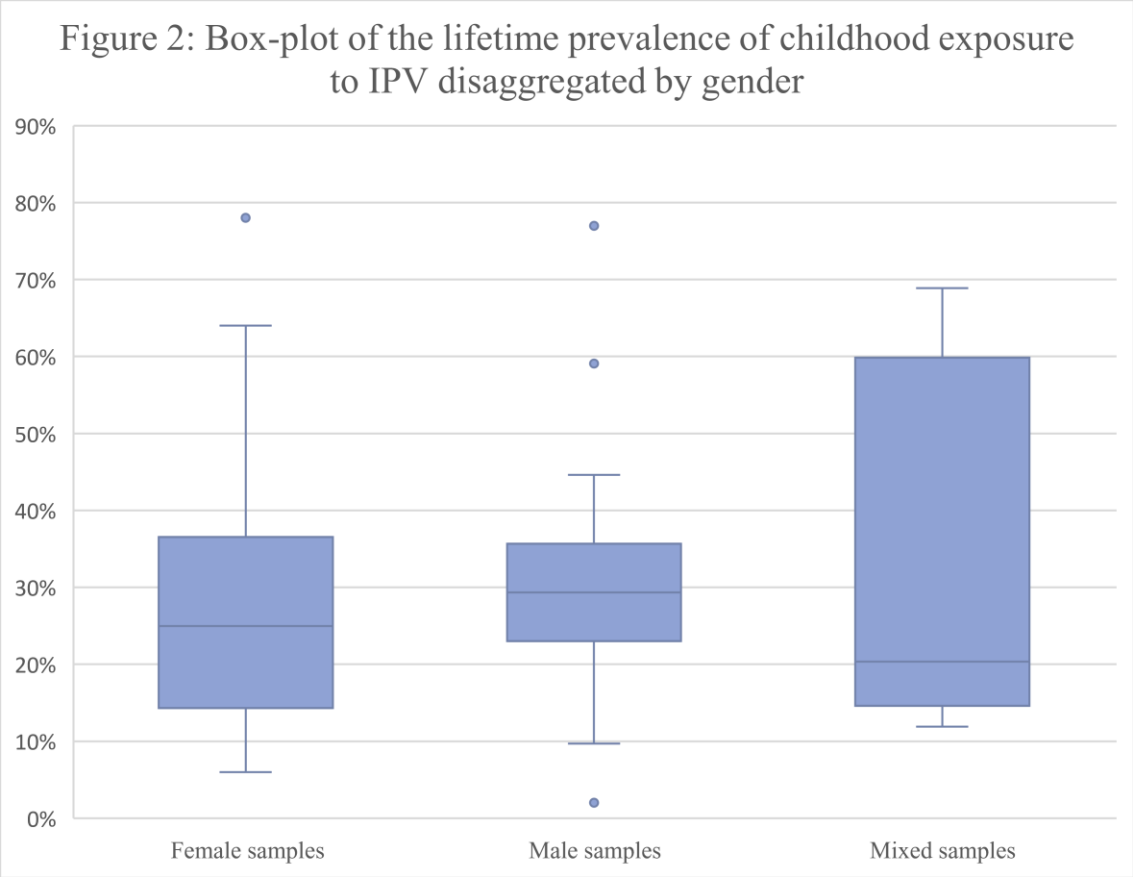
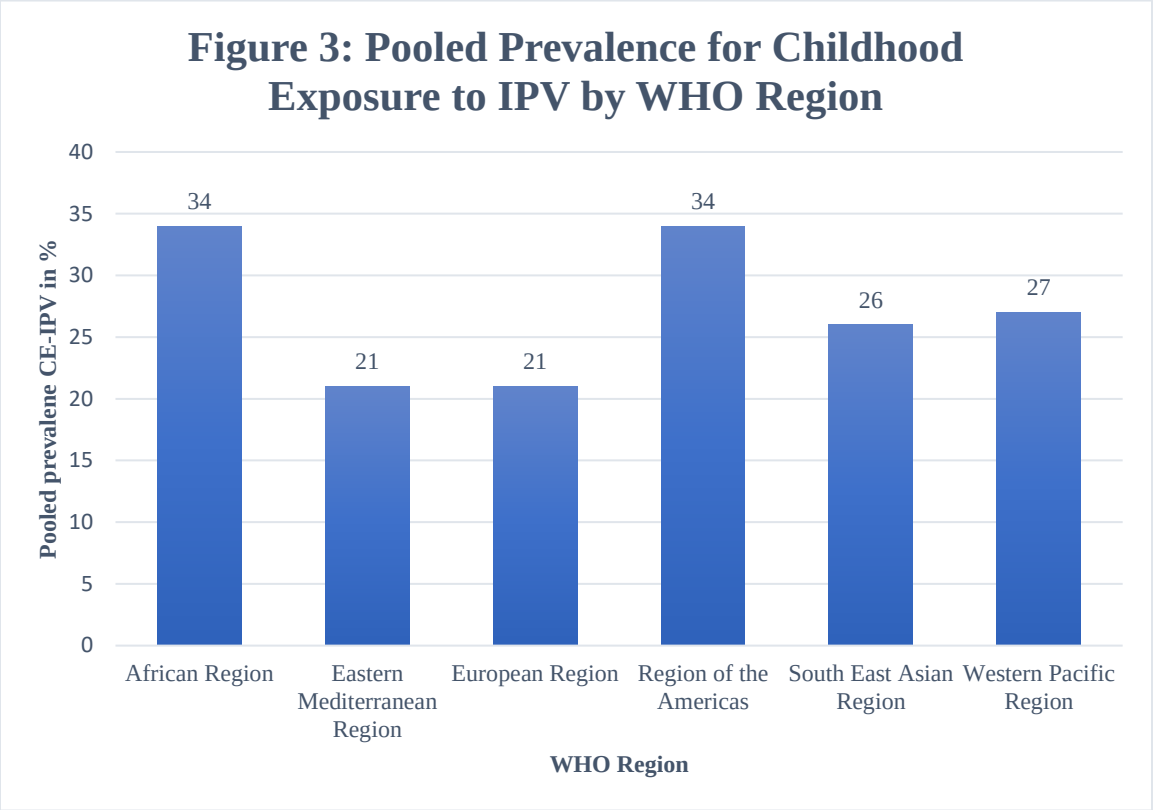


Figure 3

Pooled prevalence for childhood exposure to IPV in low-income and lower-middle income countries disaggregated by WHO region



Supplementary Material 2

Search strategy: Prevalence of childhood exposure to intimate partner violence in low-income and lower-middle-income countries: a systematic review and meta-analysis

1. Research questions

1) What is the lifetime prevalence of childhood exposure to IPV among children and adults in low-income and lower-middle-income countries?

2) What is the past-year prevalence of exposure to IPV among children in low-income and lower-middle-income countries?

2. Components of the search strategy as per protocol

1) Electronic databases: PubMed, Web of Science, WHO Global Index Medicus, CINAHL, ERIC, PsycINFO, Violence and Abuse Abstracts

2) Searches in specialized journals in particular Child Abuse and Neglect, Trauma, Violence & Abuse, Child Maltreatment.

3) Searches for relevant studies in the citations of other systematic reviews and meta-analyses.

4) Forward and backward citation chaining of included papers.

3. Global search strategy

prevalence OR epidemiol* OR cross-sectional OR survey

AND

child* OR adolescen* OR girls OR boys OR infant* OR baby OR babies OR toddler* OR preschool* OR pre-school* OR young person OR young people OR minor OR teen* OR youth*

AND

domestic violence OR parental violence OR intimate partner violence OR psychological abuse OR emotional abuse OR ((caregiver OR marital OR conjugal OR spous* OR husband OR wife OR women OR woman OR man OR men) AND (violence OR abuse OR victim* OR battered))

AND

witness* OR 'growing up' OR expos* OR poly-victimization OR poly-victimisation

4. Search strategy adapted for PubMed

PubMed Search using MeSH terms

(("Intimate Partner Violence"[Mesh] OR (("Domestic Violence"[Mesh] OR "Battered Women"[Mesh]) OR "Spouse Abuse"[Mesh])) AND (("Child"[Mesh] AND "Child, Preschool"[Mesh]) OR "Adolescent"[Mesh])) AND "Prevalence"[Mesh]

PubMed Search using Keywords

(prevalence) AND (((((child* OR adolescen* OR girl* OR boy* OR infant* OR baby OR babies OR toddler* OR preschool* OR pre-school* OR young person* OR young people OR minor* OR teen* OR adolescen* OR youth*))) AND (((domestic OR parental OR caregiver OR intimate partner OR marital OR conjugal OR spous* OR husband OR wife)) AND (violence OR abus* OR victim*))) AND ((witness* OR expos* OR growing up OR poly-victimisation OR poly-victimization)))

Combined PubMed Search using Keywords and MeSH terms

((((((("Intimate Partner Violence"[Mesh]) OR ((("Domestic Violence"[Mesh]) OR "Battered Women"[Mesh]) OR "Spouse Abuse"[Mesh]))) AND (("Child"[Mesh] AND "Child, Preschool"[Mesh]) OR "Adolescent"[Mesh])) AND "Prevalence"[Mesh])) OR ((prevalence) AND (((((child* OR adolescen* OR girl* OR boy* OR infant* OR baby OR babies OR toddler* OR preschool* OR pre-school* OR young person* OR young people OR minor* OR teen*))) AND (((domestic OR parental OR caregiver OR intimate partner OR marital OR conjugal OR spous* OR husband OR wife)) AND (violence OR abus* OR victim*))) AND ((witness* OR exposure OR growing up OR poly-victimisation OR poly-victimization))))

5. Search strategy adapted for Web of Science

Settings:

- Advanced search
- Web of Science Core Collection
- Timespan All years (1945-2019)

Note: Core Collection employs no **controlled vocabulary** or thesaurus in assigning subject terms. Natural language indexing (where every word in the title is searchable) is used.

Search strategy:

ALL FIELDS: (prevalence OR epidemiol* OR cross-sectional OR survey)

AND **ALL FIELDS:** (child* OR adolescen* OR girls OR boys OR infant* OR baby OR babies OR toddler* OR preschool* OR pre-school* OR young person OR young people OR minor OR teen* OR adolescen* OR youth*)

AND **ALL FIELDS:** (domestic violence OR parental violence OR intimate partner violence OR psychological abuse OR emotional abuse OR (caregiver OR marital OR conjugal OR spous* OR husband OR wife OR women OR woman OR man OR men) AND (violence OR abuse OR victim* OR battered))

AND **ALL FIELDS:** (witness* OR 'growing up' OR expos* OR poly-victimization OR poly-victimisation)

6. PsycINFO

Any Field: prevalence OR Any Field: epidemiol* OR Any Field: cross-sectional OR Any Field: survey AND Any Field: child* OR Any Field: adolescen* OR Any Field: girls OR Any Field: boys OR Any Field: infant* OR Any Field: baby OR Any Field: babies OR Any Field: toddler* OR Any Field: preschool* OR Any Field: pre-school* OR Any Field: young person OR Any Field: young people OR Any Field: minor OR Any Field: teen* OR Any Field: youth* AND Any Field: domestic violence OR Any Field: parental violence OR Any Field: intimate partner violence OR Any Field: psychological abuse OR Any Field: emotional abuse OR (Any Field: caregiver OR Any Field: marital OR Any Field: conjugal OR Any Field: spous* OR Any Field: husband OR Any Field: wife OR Any Field: women OR Any Field: woman OR Any Field: man OR Any Field: men) AND (Any Field: violence OR Any Field: abuse OR Any Field: victim* OR Any Field: battered)) AND Any Field: witness* OR Any Field: 'growing up' OR Any Field: exposure OR Any Field: expose* OR Any Field: poly-victimization OR Any Field: poly-victimisation

7. Global Index Medicus

(tw:(prevalence OR epidemiol* OR cross-sectional OR survey)) AND (tw:(child* OR adolescen* OR girls OR boys OR infant* OR baby OR babies OR toddler* OR preschool* OR pre-school* OR young person OR young people OR minor OR teen* OR youth*)) AND (tw:(domestic violence OR parental violence OR intimate partner violence OR psychological abuse OR emotional abuse OR ((caregiver OR marital OR conjugal OR spous* OR husband OR wife OR women OR woman OR man OR men) AND (violence OR abuse OR victim* OR battered)))) AND (tw:(witness* OR 'growing up' OR exposure OR expose* OR poly-victimization OR poly-victimisation)) AND (instance:"ghl")

Supplementary Material 3

Characteristics of studies included in meta-analysis

Author & Year	Country	National or sub-national sample	Gender	Age range / median age	Sample Source	Sampling procedure	Sample Size	CE-IPV Prevalence rate (%)	Type of witnessed violence	Reference frame	Risk of Bias
Abramsky 2011 (1)	Bangladesh	sub-national	female	15;49	household	two stage cluster sample	934	9%	physical	lifetime	low
Abramsky 2011 (1)	Bangladesh	sub-national	female	15;49	household	two stage cluster sample	1053	4%	physical	lifetime	low
Abramsky 2011 (1)	Ethiopia	sub-national	female	15;49	household	two stage cluster sample	1873	4%	physical	lifetime	low
Abramsky 2011 (1)	Peru	sub-national	female	15;49	household	two stage cluster sample	1008	9%	physical	lifetime	low
Abramsky 2011 (1)	Peru	sub-national	female	15;49	household	two stage cluster sample	746	7%	physical	lifetime	low
Abramsky 2011 (1)	Samoa	sub-national	female	15;49	household	two stage cluster sample	932	2%	physical	lifetime	low
Abramsky 2011 (1)	Tanzania	sub-national	female	15;49	household	two stage cluster sample	922	7%	physical	lifetime	low
Abramsky 2011 (1)	Tanzania	sub-national	female	15;49	household	two stage cluster sample	1169	9%	physical	lifetime	low
Abramsky 2011 (1)	Thailand	sub-national	female	15;49	household	two stage cluster sample	781	5%	physical	lifetime	low
Abramsky 2011 (1)	Thailand	sub-national	female	15;49	household	two stage cluster sample	848	6%	physical	lifetime	low
Alangea 2018 (2)	Ghana	sub-national	female	18;49	household	simple random	2000	4%	physical	lifetime	low
Alizzy 2017 (3)	Yemen	sub-national	female	11;16	school	simple random	303	3%	physical	lifetime	low
Alizzy 2017 (3)	Yemen	sub-national	male	11;16	school	simple random	295	4%	physical	lifetime	low
Ameli 2017 (4)	Malawi	sub-national	female	10;19	school	convenience sample	281	28%	physical and emotional	lifetime	moderate

Ameli 2017 (4)	Malawi	sub-national	male	10;19	school	convenience sample	280	10%	physical and emotional	lifetime	moderate
Amir-ud-Din 2018 (5)	Pakistan	national	female	15;49	household	multi-stage cluster sample	3265	31%	physical	lifetime	low
Antai 2016 (6)	Egypt	national	female	15;49	household	multi-stage cluster sample	4144	21%	physical	lifetime	low
Atiqul 2019 (7)	Bangladesh	sub-national	mixed	11;17	household	simple random	1416	20%	physical	lifetime	low
Atteraya 2015 (8)	Nepal	national	female	15;49	household	multi-stage cluster sample	3373	17%	physical	lifetime	low
Chirwa 2018 (9)	Ghana	sub-national	male	39.5	household	multi-stage cluster sample	1973	38%	physical	lifetime	low
Clark 2019 (10)	Nepal	sub-national	female	19;49	household	multi-stage cluster sample	1800	31%	physical	lifetime	low
Das 2014 (11)	India	sub-national	male	10;16	school	convenience sample	1040	12%	physical and emotional	lifetime	moderate
Deb 2016 (12)	India	sub-national	female	15;18	school	convenience sample	188	15%	physical and emotional	past year	moderate
Deb 2016 (12)	India	sub-national	male	15;18	school	convenience sample	182	12%	physical and emotional	past year	moderate
Devries 2017 (13)	Uganda	sub-national	female	11;14	school	stratified multi-stage cluster sample	1658	37%	physical and emotional	lifetime	low
Devries 2017 (13)	Uganda	sub-national	male	11;14	school	stratified multi-stage cluster sample	1572	17%	physical and emotional	lifetime	low
Dibaba 2008 (14)	Ethiopia	sub-national	female	31.8	community	simple random	308	14%	physical	lifetime	low
Fawole 2018 (15)	Nigeria	sub-national	mixed	10;21	school	stratified multi-stage cluster sample	640	9%	unclear	lifetime	moderate
Fleming 2015 (16)	Democratic Republic of the Congo	sub-national	male	18;59	household	random sample, stratified by age and province	539	4%	physical	lifetime	low
Fleming 2015 (16)	Rwanda	sub-national	male	18;59	household	random sample, stratified by age and	1456	5%	physical	lifetime	low
Gage 2005 (17)	Haiti	national	female	15;49	household	two-stage stratified cluster sample	2564	2%	physical	lifetime	low

Gage 2015 (18)	Haiti	sub-national	female	>=14	school	convenience sample	187	9%	physical	lifetime	moderate
Gage 2015 (18)	Haiti	sub-national	male	>=14	school	convenience sample	155	0%	physical	lifetime	moderate
Gautam 2019 (19)	Nepal	national	female	15;49	household	multi-stage cluster sample	3562	4%	physical	lifetime	low
Goodman 2017 (20)	Kenya	sub-national	female	18;89	household	simple random	1966	8%	physical	lifetime	low
Hayati 2011 (21)	Indonesia	sub-national	male	15;49	household	multi-stage cluster sample	765	2%	physical	lifetime	low
Hayes 2018 (22)	Kyrgyz Republic	national	female	15;49	household	two-stage stratified cluster sample	3171	5%	physical	lifetime	low
Hayes 2018 (22)	Moldova	national	female	15;49	household	two-stage stratified cluster sample	3355	5%	physical	lifetime	low
Hayes 2018 (22)	Tajikistan	national	female	15;49	household	two-stage stratified cluster sample	3093	4%	physical	lifetime	low
Islam 2014 (23)	Bangladesh	national	female	15;49	household	stratified multi-stage cluster sample	3910	6%	physical	lifetime	low
Islam 2017 (24)	Bangladesh	national	male	18;54	household	stratified multi-stage cluster sample	3374	7%	physical	lifetime	low
James-Hawkins 2018 (25)	Bangladesh	sub-national	male	18;34	household	stratified multi-stage cluster sample	570	2%	physical	lifetime	low
Jeyaseelan 2004 (26)	Egypt	sub-national	female	15;49	household	simple random	631	6%	physical	lifetime	low
Jeyaseelan 2004 (26)	India (Lucknow)	sub-national	female	15;49	household	simple random	506	6%	physical	lifetime	low
Jeyaseelan 2004 (26)	India (Trivandru	sub-national	female	15;49	household	simple random	700	9%	physical	lifetime	low
Jeyaseelan 2004 (26)	India (Vellore)	sub-national	female	15;49	household	simple random	716	1%	physical	lifetime	low
Jeyaseelan 2004 (26)	Philippines	sub-national	female	15;49	household	simple random	1000	7%	physical	lifetime	low
Jirapramukpitak 2005 (27)	Thailand	sub-national	female	16;25	household	simple random	199	8%	physical	lifetime	low
Jirapramukpitak 2005 (27)	Thailand	sub-national	male	16;25	household	simple random	144	0%	physical	lifetime	low
Kinyanda 2013 (28)	Uganda	sub-national	mixed	3;19[1]	household	multi-stage cluster sample	1587	7%	physical and	lifetime	moderate
Kwagala 2013 (29)	Uganda	national	female	15;49	household	stratified multi-stage cluster sample	1307	2%	physical	lifetime	low

Laeheem 2009 (30)	Thailand	sub-national	mixed	8;11	school	random sample, stratified by school	1440	50%	physical	lifetime	low
Lakhdir 2017 (31)	Pakistan	sub-national	mixed	11;17	household	multi-stage cluster sample	800	35%	physical	lifetime	low
Le 2015 (32)	Vietnam	sub-national	mixed	16.5	school	two-stage stratified cluster sample	1606	12%	physical	lifetime	low
Lui 2018 (33)	Solomon Islands	sub-national	male	18;70	household	multi-stage cluster sample	400	27%	physical and emotional	lifetime	low
Mandal 2015 (34)	Philippines	sub-national	female	21;22	household	one-stage cluster sample	892	33%	physical	lifetime	low
Mandal 2015 (34)	Philippines	sub-national	male	21;22	household	one-stage cluster sample	989	36%	physical	lifetime	low
Martin 2002 (35)	India	sub-national	male	not reported	household	multi-stage cluster sample	6902	11%	physical	lifetime	low
Maxwell 2003 (36)	Philippines	sub-national	female	not reported	school	multi-stage cluster sample	685	40%	physical	past year	moderate
Maxwell 2003 (36)	Philippines	sub-national	male	not reported	school	multi-stage cluster sample	694	37%	physical	past year	moderate
Meekers 2013 (37)	Bolivia	national	female	15;49	household	multi-stage cluster sample	10119	24%	physical	lifetime	low
Ndetei 2007 (38)	Kenya	sub-national	mixed	12;26	school	convenience sample	1110	17%	unclear	lifetime	moderate
Neupane 2018 (39)	Nepal	sub-national	mixed	12;18	school	cluster-sample	962	9%	unclear	lifetime	low
Neupane 2018 (39)	Nepal	sub-national	mixed	12;18	school	cluster-sample	962	7%	unclear	past year	low
Ogum 2018 (40)	Ghana	sub-national	female	18;49	household	multi-stage stratified cluster sample	2000	4%	physical	lifetime	low
O'Leary 2008 (41)	Ukraine	national	female	46 (median	household	multi-stage cluster sample	558	7%	physical and	lifetime	low
O'Leary 2008 (41)	Ukraine	national	male	46 (median	household	multi-stage cluster sample	558	2%	physical and	lifetime	low
Onigbogi 2015 (42)	Nigeria	sub-national	female	18;65	household	multi-stage cluster sample	400	9%	physical	lifetime	low
Owusu 2016 (43)	Ghana	national	female	15;49	household	multi-stage cluster sample	1524	2%	physical	lifetime	low
Pallitto 2008 (44)	El Salvador	national	female	15;24	household	multi-stage probabilistic random sample	3753	6%	physical	lifetime	low

Panter-Brick 2011 (45)	Afghanistan	sub-national	mixed	11;16	school	stratified random sample	234	57%	physical	past year	low
Ramiro 2010 (46)	Philippines	sub-national	female	46.7	household	simple random	533	24%	physical	lifetime	low
Ramiro 2010 (46)	Philippines	sub-national	male	46.7	household	simple random	535	32%	physical	lifetime	low
Reese 2017 (47)	Tanzania	national	female	15;49	household	two-stage cluster sample	4975	11%	physical	lifetime	low
Sabri 2014 (48)	India	national	female	15;49	household	nationally representative	67226	20%	physical	lifetime	low
Solanke 2018 (49)	Nigeria	national	female	15;49	household	stratified three-stage cluster sample	19924	8%	physical	lifetime	low
Speizer 2010 (50)	Uganda	national	female	15;49	household	multi-stage cluster sample	1749	48%	physical	lifetime	low
Speizer 2010 (50)	Uganda	national	male	14;54	household	multi-stage cluster sample	1318	39%	physical	lifetime	low
Tenkorang 2013 (51)	Ghana	national	female	15;45	household	two-stage cluster sample	1835	33%	physical	lifetime	low
Tenkorang 2018 (52)	Ghana	national	female	38	household	two-stage cluster sample	2289	6%	unclear	lifetime	low
Thomson 2015 (53)	Rwanda	national	female	15;49	household	two-stage cluster sample	4066	2%	physical	lifetime	low
Tiruneh 2018 (54)	Democratic Republic of the Congo	national	female	15;49	household	stratified two-stage cluster sample	5120	7%	physical	lifetime	low
Tran 2017 (55)	Vietnam	sub-national	female	12;17	school	cluster-sample	975	24%	physical	lifetime	low
Tran 2017 (55)	Vietnam	sub-national	male	12;17	school	cluster-sample	876	23%	physical	lifetime	low
Uthman 2011 (56)	Nigeria	national	female	20;44	household	two-stage cluster sample	8731	10%	physical	lifetime	low
VanderEnde 2016 (57)	Malawi	national	male	18;24	household	four-stage cluster sample	447	2%	physical	lifetime	low
Vung 2009 (58)	Vietnam	sub-national	female	17;60	household	stratified cluster sample	730	6%	physical	lifetime	low
Wahdan 2014 (59)	Egypt	sub-national	mixed	11;19	household	multi-stage cluster sample	783	4%	physical	lifetime	low
Yount 2016 (60)	Vietnam	sub-national	female	18;50	household	cluster-sample	533	6%	physical	lifetime	low

Yount 2016 (61)	Vietnam	sub-national	male	18;51	household	cluster-sample	522	57%	physical	lifetime	low
Yount 2018 (62)	Bangladesh	sub-national	male	18;49	household	cluster-sample, probability	1508	69%	physical	lifetime	low

[1] Caregivers interviewed for those <10

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PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	3
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	1
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	3
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS). *Note: Systematic review of prevalence, interventions and comparisons n.a.*	3
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	1 and 4
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	4
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	4
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Suppl. 2
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	4
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	5
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	3/4
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	5/6
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	3/4
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	6

PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	5
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	7
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	Figure 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	Suppl. 3
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	Suppl. 3
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	Suppl. 3
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	7
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	n/a
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	7
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	7/8
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	10
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	10
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	Cover page

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

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Prevalence of childhood exposure to intimate partner violence in low-income and lower-middle-income countries: a systematic review

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Authors' contributions: BK developed the research questions and conducted the searches. BK and MK screened the papers for inclusion and extracted the data for the analysis. MK provided detailed guidance throughout the review process. BK performed the data analysis. TP provided advice on research methods and verified the analytical methods. BK took the lead in writing the manuscript. All authors provided critical feedback and helped shape the research, analysis and draft manuscript. TP and HM provided overall guidance and supervision.

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Abstract

Objective

To determine the proportion of children in low-income and lower-middle-income countries exposed to intimate partner violence.

Design

Systematic review

Data sources

PubMed, CINAHL, ERIC, PsycINFO, Web of Science, WHO Global Index Medicus, and Violence and Abuse Abstracts, hand searching of specialized journals from inception until 19 May 2019.

Eligibility Criteria for selecting studies

Primary quantitative studies that included a measure of self-reported exposure to intimate partner violence (IPV) prior to age 18 and were conducted in low-income and lower-middle-income countries.

Data extraction and Synthesis

Data were screened, extracted and appraised by two independent reviewers. The prevalence estimates were pooled using a random-effects model. Outcomes included lifetime and past-year prevalence of childhood exposure to IPV. Meta-regression was used to explore heterogeneity. Publication bias was assessed using a funnel plot and Egger's regression test. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed.

Results

Sixty-two studies with a total of 231 512 participants were included. Eighty-five lifetime prevalence estimates and 6 estimates of past-year prevalence were available for synthesis. The average lifetime prevalence of childhood exposure to IPV was 29% (95% CI: 26%; 31%). The average past-year prevalence in children was 35% (95% CI: 21%; 48%). The lifetime prevalence disaggregated by WHO regions ranged from 21% to 34%. There were no statistical differences in prevalence estimates between samples of men and women.

Conclusion

Almost one third of children in low- and lower-middle-income countries have been exposed to IPV in their lifetime. There was large heterogeneity between estimates that was not explained by available study and sample characteristics. Our findings indicate that children's exposure to IPV in low-income and lower-middle-income countries is common and widespread; prevention of this major public health exposure should be a priority.

Data availability statement

All data relevant to the study are included in the article or uploaded as online supplemental information.

Prospero registration number

CRD42019119698

Keywords: prevalence, intimate partner violence, domestic violence, child witness, childhood exposure to intimate partner violence

Strengths and limitations of this study

- This is the first systematic review to assess the prevalence of childhood exposure to intimate partner violence in low-income and lower-middle-income countries.
- A large number of eligible articles were screened and included in the review.
- This systematic review responds to a policy-relevant priority identified by stakeholders from low-income and lower-middle-income countries.
- The lack of consensus around the definitions and measures of exposures makes it challenging to derive a global prevalence figure for low-income and lower-middle-income countries.
- Only published studies were included in the systematic review. Unpublished data and data from government or NGO-reports were not considered.

Prevalence of childhood exposure to intimate partner violence in low-income and lower-middle-income countries: a systematic review

Introduction

Intimate partner violence (IPV) is a serious human rights and public health problem globally. Worldwide, one in three women is affected by IPV (1). Such violence often takes place in the presence of children and can have severe and long-lasting impact on children's health and development.

Childhood exposure to IPV includes either the direct observation or mere awareness without directly seeing or hearing violent acts or abuse between caregivers who are current or former spouses or intimate partners (2, 3). Such awareness can include the child seeing some of the immediate consequences or overhearing a conversation about the violent act, experiencing life changes as a consequence of violence (for example separation from a parent), or intervening directly in an attempt to stop the violent act (4). Childhood exposure to IPV has been associated with a broad range of physical and mental health problems, health risk behaviours and social consequences. These effects vary depending on age and developmental stage of the child at the time of exposure, as well as factors such as duration and severity, and overlap with other types of maltreatment (5,6). The broad range of mental health problems associated with childhood exposure to IPV include increased risk for depression, anxiety, conduct disorder, adjustment problems and posttraumatic stress disorder (7, 8). IPV exposure has also been associated with reduced cognitive ability and educational achievement (9). Witnessing IPV in childhood is consistently identified as a risk factor for perpetrating and experiencing IPV in adulthood (10,11). Children exposed to IPV have a higher likelihood of engaging in health risk behaviours including tobacco use, the harmful use of alcohol, other types of substance use and unsafe sex (12). The increased risk for these behaviours partly explains the increased risk for chronic health outcomes including HIV, reproductive health problems, and non-communicable diseases, including cardiovascular disease, cancer, and diabetes, among others (13,14).

Despite the widespread nature of IPV and its severe consequences for children, major gaps remain in understanding the epidemiology of children's exposure, especially in low-income countries. Much of the literature has focused on high-income countries, which have shown that 8-25% of children are exposed to IPV in their home (2). To our knowledge, no systematic review has attempted to synthesize existing prevalence studies of childhood exposure to IPV from low-income and lower-middle-income countries. This information is important in identifying risk factors for physical and mental health conditions in children in low- and lower-middle-income countries, and determining what is needed with regard to policies and service provision.

We conducted a systematic review to address the need for an overview of prevalence estimates of exposure to IPV among children living in low-income and lower-middle-income countries around the world.

Methods

Research questions and outcome variables

This systematic review addresses the following research questions: 1. What is the lifetime prevalence of childhood exposure to IPV among children and adults in low-income and lower-middle-income countries? 2. What is the past-year prevalence of exposure to IPV among children in low-income and lower-middle-income countries?

The outcome of interest, childhood exposure to IPV, was defined as direct observation or awareness of violence between caregivers who are current or former spouses or intimate partners (2, 3). IPV refers to behaviour by an intimate partner or ex-partner that causes physical, sexual or psychological harm, including physical aggression, sexual coercion, psychological abuse and controlling behaviours (15). To determine lifetime prevalence, relevant studies included data collected from adults, who reported exposure to IPV at any point in their lives up to the age of 18 years, and children, who reported exposure to IPV at any point in their lives up to the time of the survey.

The study followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines (**Supplementary Material 1**). A protocol for this review was registered at PROSPERO Registry of the Centre for Reviews and Dissemination of the University of York (https ://www.crd.york.ac.uk/PROSPERO; ID:CRD 42019119698).

Literature Search Strategy

A four-step search strategy was applied to identify relevant studies. First, we searched seven electronic databases: PubMed, CINAHL (EBSCOhost), ERIC (ProQuest), PsycINFO (ProQuest), Web of Science, WHO Global Index Medicus, and Violence and Abuse Abstracts (EBSCOhost). A search strategy was developed for each database using a combination of free text and controlled vocabulary and was reviewed by a PhD-trained information scientist with extensive experience in systematic review methodology and systematic reviews focused on exposure to various types of interpersonal violence, including childhood exposure to IPV. All papers published before 19 May 2019 were considered. Searches were conducted in English language but no language restrictions were placed on the search results.

The search terms included combinations and iterations of “prevalence”, “childhood”, “intimate partner violence” and “exposure” or “witnessing”. The full search strategy for each database is available in **Supplementary Material 2**. Searches for each database were evaluated against a sub-sample of ten papers that were predetermined by the research team to meet the inclusion criteria (16).

Database searches were supplemented by hand searches of specialized journals focused on interpersonal violence, which were conducted in May 2019. The journals included *Child Abuse & Neglect*, *Child Maltreatment*, and *Trauma, Violence & Abuse*. Forward and backward citation chaining of included papers was conducted from April 2020 until May 2020 to capture any papers potentially missed by database searches and which may have been published up until the submission of this manuscript for publication.

Eligibility Criteria

We included primary quantitative studies that measured the prevalence of current and past exposure to IPV prior to the age of 18. Male, female and mixed-sex[1] samples from low-income and lower-middle-income countries according to World Bank country and lending classification (as of October 2019) were considered (17). Data collected at national or sub-national levels were eligible. Data from both household surveys and school surveys were considered. The minimum cut-point for survey response rate was set at over 60%.

Title and Abstract Screening, Full-Text Screening, and Data Extraction

Titles and abstracts of all articles identified via the search strategy were screened by one reviewer (BK). A sample (5%) of the total records was screened by a second reviewer (MK) to check the consistency of the application of the inclusion/exclusion criteria. Disagreements were resolved through discussion and involvement of a third reviewer (HM). The interrater reliability was substantial with Cohen's Kappa k=.74.

At the second stage, 100 full texts were assessed for eligibility by one reviewer (BK) applying the checklist with inclusion/exclusion criteria. A subset (20%) of the full texts was assessed by a second reviewer (MK). The agreement between the reviewers was substantial with Cohen's Kappa k=.74.

A standardized template was created for data extraction. The main variables included study information, characteristics of the sample, study methodology (study type, sampling method, survey item, mode of data collection), and prevalence estimates. Data extraction for all included studies was conducted by one reviewer (BK). Twenty papers underwent independent data extraction by a second reviewer (MK). There was perfect agreement on the extraction of study information, including prevalence estimates, across reviewers.

Quality Assessment and Assessment of Bias

Study quality was assessed during the data extraction process using a standardized risk of bias tool for prevalence studies (Table 1) adapted from Hoy et al. (18). The nine items cover different aspects of external and internal validity. Two reviewers (BK and MK) classified each of the items describing potential sources of bias into low risk or high risk. A summary score was then calculated by adding all the items rated high risk. A summary score of 0 – 3 is considered low risk, 4 - 6 moderate risk, and a score of 7 - 9 indicates the study is at high risk of bias. Studies with low and moderate risk of bias were included in the systematic review.

We assessed publication bias using a funnel plot and Egger's regression test (19).

Table 1 Risk of Bias assessment (adapted from Hoy et al., 2012)

External validity (maximum score=4)
Was the study's target population a close representation of the national population in relation to relevant variables such as age, sex, occupation, urban/rural population? (Yes: low risk=0 points; no: high risk=1 point)

[1] Some surveys use biological sex and some surveys use the term gender.

Was the sampling frame a true or close representation of the target population (household sample and/or primary school sample)? (Yes: low risk=0 points; No: high risk=1 points)
Was some form of random selection used to select the sample, or was a census undertaken? (Yes: low risk=0 points; no: high risk=1 point)
Was the likelihood of non-response bias minimal (Response rate >= 75% or explicitly stated that there was no difference between responders and non-responders)? (Yes: low risk=0 points; no: high risk=1 point)
Internal validity (maximum score=5)
Were data collected directly from the subjects (as opposed to a proxy)? (Yes: low risk=0 points; no: high risk=1 point)
Was an acceptable case definition used in the study? Where subjects asked whether they witnessed or were aware of physical, sexual or emotional violence between their caregivers? (Yes: low risk=0 points; no: high risk=1 point)
Was the study instrument that measured the parameter of interest shown to have reliability and validity (item derived from an instrument that had widely been tested for reliability or validity, or explicitly stated that validity has been measured)? (Yes: low risk=0 points; no: high risk=1 point)
Was the same mode of data collection used for all subjects? (Yes: low risk=0 points; no: high risk=1 point)
Were the numerator(s) and denominator(s) for the parameter of interest appropriate? (Yes: low risk=0 points; no: high risk=1 point)

Data Synthesis

A meta-analysis was performed to synthesize the lifetime and past-year prevalence of childhood exposure to IPV. Prevalence rates were calculated from raw proportions or percentages reported in the included studies. Pooled prevalence estimates were determined for lifetime and past-year prevalence. The prevalence estimates were disaggregated by gender, wherever this information was available. Studies that did not disaggregate by gender were included in the category "mixed samples". When studies provided different estimates for exposure to physical violence and emotional violence for the same sample, we chose "physical violence", as this was the measurement applied by the majority of the studies. All analyses were done with METAPROP in STATA 14.0 designed to perform meta-analyses of proportions. The programme computes 95% confidence intervals using the score statistic and the exact binomial method and incorporates the Freeman-Tukey double arcsine transformation of proportions (20). The overall prevalence estimates were pooled based on a random-effects model, which takes into account that observed differences between proportions cannot be entirely attributed to the sampling error and that other factors such as true differences between study populations and methodologic differences can also contribute. Weights were applied according to the inverse of the variance. Given that within-study variance was relatively small and the variance between studies was substantial, the weights were similar across all studies. 95% CIs were calculated around the pooled estimates. To assess the extent of variation between studies, heterogeneity tests with the I^2 statistic were performed.

No pre-specified stratified analyses were planned for this study. Additional analyses and visual inspection of the data were conducted post hoc, following the observation of the high heterogeneity of the prevalence estimates.

Patient and public involvement

Not applicable. We performed a systematic review on published data.

Results

A total of 6903 records were obtained through database searching and 265 additional records through hand searches. After duplicates were removed, 5556 titles and abstracts were screened for their relevance. This first screening resulted in 100 potentially eligible studies, which were then screened using the full text of the article. After full-text screening, 55 studies were identified for inclusion in the review. Main reasons for exclusion were that several papers were published using data from the same sample or did not provide prevalence estimates. Detailed reasons for exclusion are provided in the PRISMA diagram (**Figure 1**). If several publications drew on data from the same study, the study that provided the most information, was selected. Forward and backward citation chaining of included studies yielded another seven eligible articles, so that a total of 62 studies were included in the review (**Supplementary Material 3**). According to the risk of bias assessment (18) eight studies were classified as moderate risk of bias, and 54 studies were classified as low risk of bias. No studies had to be excluded based on the risk of bias assessment. Some of these studies are multi-country studies, or they disaggregated data collection by males and females, so that the total number of available prevalence estimates is 91.

We retrieved studies from 29 low- and lower-middle income countries with data from 231 512 individuals. Twenty-seven estimates were based on data from representative national surveys and 64 estimates were based on data from sub-national administrative units such as regions or districts. Almost all studies reported applying a form of random sampling (k= 57); 5 studies used convenience samples. The included studies yielded 85 estimates for lifetime prevalence of childhood exposure to IPV and six estimates on past-year prevalence. Sixty-eight prevalence estimates were determined from household sample data; 22 prevalence estimates were based on data from school-based samples and one prevalence estimate were based on data collected in public institutions in the community. Most studies measured exposure to physical IPV between caregivers (k=55), seven studies measured exposure to physical and emotional IPV. Twenty-two studies operationalized exposure to physical IPV between caregivers as bi-directional violence, and 45 studies explicitly asked whether IPV was perpetrated by the father against the mother.

The overall random-effects pooled lifetime prevalence of childhood exposure to IPV across all samples (n=85) was 29% (95% CI: 26%; 31%) with a high level of heterogeneity across studies (I^2=99.67%, p<0.001 ; T^2=0.02). Lifetime prevalence estimates ranged from a minimum of 2% to a maximum of 78%, with an interquartile range from 16% to 37% and a median of 26%. The pooled past-year prevalence (n=6) was 35% (95% CI: 21%; 48%) with similarly high levels of heterogeneity (I^2=98.3%, p<.001; T^2=0.03). The past-year prevalence estimates spread from 12% to 57%. The interquartile range reached from 22% to 49% with a median prevalence of 34%.

The lifetime prevalence in studies that involved either male or female samples or provided a gender breakdown (n=76) was 27% (95% CI: 23%; 30%) for females and 31% (95% CI 25%; 38%) for males. Minimum and maximum values and quartiles for female, male and mixed samples are shown in **Figure 2**. The past-year prevalence (n=4) was 29% (95% CI 26%, 32%) for females and 28% (95% CI 25%, 31%) for males. The difference between female, male and mixed samples was not statistically significant for lifetime (p=.39) or for past-year prevalence (p=.66).

To explore the sources of heterogeneity, sample size, median age of the sample, risk of bias rating, geographical region and data collection method (household, school) were entered into a meta-regression. None of the independent variables was statistically significantly associated with prevalence.

The funnel plot was asymmetric, whereby asymmetry was caused by smaller studies that tended to give results emphasizing higher prevalence rates. Egger's regression test was significant (p=.03). We applied the trim and fill method to calculate whether potential publication bias had an impact on the pooled prevalence estimates (21). Seven additional studies were imputed, but they did not change the summary estimate.

The global and WHO regional prevalence estimates for childhood exposure to IPV are shown in **Figure 3**. The pooled prevalence in low-income and lower-middle-income countries in the South East Asian Region (SEARO), based on 23 samples, was 26% (95% CI: 21%; 30%), in the African Region (AFRO) 34% (95% CI: 27%;40%) based on 30 samples, in the Region of the Americas (PAHO) 34% (95% CI: 19%;49%) based on seven samples, in the Western Pacific Region (WPRO) 27% (95% CI: 20%;34%) based on 13 samples, in the Eastern Mediterranean Region (EMRO) 21% (95% CI: 15%;26%), based on seven samples, and in low-income and lower-middle-income countries from the European Region (EURO) 21% (95% CI: 12%;29%) based on 5 samples. The heterogeneity between geographical regions was statistically significant (p=.04).

Discussion

We used meta-analytical methods to explore prevalence estimates of childhood exposure to IPV, which were reported in 62 studies, citing results of 91 samples from low-income and lower-middle-income countries. The average lifetime prevalence was 29% (past-year prevalence: 35%); almost one in three individuals reported being exposed to IPV during their childhood. Based on 2019 population estimates (22), this amounts to 117 million children in low-income and lower-middle-income countries who have experienced exposure to IPV. We found high levels of heterogeneity across studies. Therefore, results need to be interpreted with caution. We cannot assume that the average prevalence we found is universally valid for the countries we studied. The median prevalence of the studies we reviewed was 26%, with an interquartile range between 16% and 37% for the lifetime prevalence of childhood exposure to IPV.

To our knowledge, this is the first systematic review of prevalence of children's exposure to IPV in low-income or lower-middle income countries. A review of child maltreatment from high-income countries (23) has shown that 8 to 25% of children witnessed IPV. A review from high- and middle-income countries in the Asia Pacific Region (24) reported that 10-39% of children were exposed to IPV. Given the heterogeneity of the estimates that was also found in the studies conducted in high-income countries, it would be premature to draw conclusions about the relationship between the socio-economic status of the country and childhood exposure to IPV. Poorer economies are potentially less able to invest in social welfare programmes and law enforcement tends to be underfunded, which is likely to be associated with higher levels of IPV. Results from several studies show that economic policies that contribute to reductions in household income and increased financial uncertainty are associated with increases in maltreatment (25).

Childhood exposure to IPV continues to receive less attention than other forms of violence, although the issue has gained some visibility in recent years. It is a type of violence that is often not included as a focus of researchers and policymakers who address either violence against children or violence against women.

This is also reflected in international agreements. While physical, psychological and sexual abuse of women and physical and sexual abuse of children are explicitly addressed in the targets of the 2030 Agenda for Sustainable Development, which has been adopted by all United Nations Member States in 2015, the international community did not address the fact that these forms of violence are often linked and that violence against women can also have detrimental effects on children.

Statistically significant differences were found between WHO regions. Childhood exposure to IPV was highest in the Americas and the African Region and lowest in low-income countries of the European Region and the Eastern Mediterranean Region. Factors that could explain the variance between regions include true differences in prevalence influenced by culture-specific social or gender-norms that affect the frequency of occurrence of IPV, whether IPV is occurring in front of children or concealed from children, or the social acceptability for children to admit to being exposed to IPV. Since the items assessing exposure to IPV were not validated across cultural settings, differences in the understanding of the semantic content across cultures could also have affected the differences found between WHO regions.

Although we found prevalence estimates from almost half of the countries that are classified as low-income and lower-middle-income countries, prevalence studies seem to be sparse in large parts of Africa, Maghreb, in countries with civil war and conflict, and in countries with small populations. This can only partially be explained by the fact that we only considered papers that were published in certain languages.

Similar to findings from surveys from high-income countries, we did not find statistically different prevalence estimates between male and female samples (26, 27). This finding is surprising, as in many societies, especially when traditional gender norms persist, girls tend to spend on average more time at home than boys (28).

High heterogeneity seems to be a shared feature of prevalence reviews on children's exposure to IPV (23, 24) and on other types of violence against children (29-32). The large variance we found is likely associated with common methodological issues related to how prevalence estimates are derived or due to a true variability of exposure to IPV. We did not find that study characteristics such as the sample size, the median age of the sample, the risk of bias rating or the setting in which data was collected could explain the heterogeneity. There are few analyses of how study characteristics influence prevalence in child maltreatment research, and none in the area of childhood exposure to IPV. Meta-analyses in other areas of child maltreatment prevalence research found that less rigorous sampling strategies and smaller sample sizes were associated with higher prevalence estimates (31,32).

There are several strengths of this systematic review. It is the first study to synthesize existing prevalence data on childhood exposure to IPV from low-income and lower-middle-income countries. Although measurement issues make it difficult to derive a global prevalence figure, results of our review indicate that children's exposure to IPV is a very important public health problem across countries.

Research implications of findings

The large between-studies heterogeneity reported here and elsewhere, highlights the importance of further research to identify and address the sources of such large variance. It would be important to establish to what extent the heterogeneity is due to real variations in childhood exposure to IPV and to what extent it is a methodologic artifact.

Future research would thereby benefit from clear definitions of childhood exposure to IPV. Several researchers have stressed the importance of comprehensive measurement of children's exposure to IPV(33).

Although there is some congruence in the measurement instruments used to assess the prevalence of childhood exposure to IPV, there is no gold standard. It remains to be determined whether the various instruments that are applied are comparable. To improve the accuracy and comparability of items that measure childhood exposure to IPV, instruments should at least specify the type of IPV exposure (physical, emotional, sexual), and in what way the child was exposed (e.g., as a direct observer, having overheard someone talk about the abuse, having direct involvement, experiencing negative consequences from abuse in the home).

Few surveys use a similar methodology across countries. A global research effort involving systematic approaches to measuring childhood victimization would provide important epidemiological information that could assist prevention and intervention efforts.

Practice and policy implications

Our findings show that children's exposure to IPV is widespread in low-income and lower-middle-income countries. Given that childhood exposure to IPV is linked to a broad range of physical and mental health problems, health risk behaviours and social consequences (7-14,34) including in low-income countries (35), healthcare and social service providers should consider the impact that IPV has on children, when providing care and services to victims of IPV.

Services for child and adult victims of IPV are commonly not delivered in an integrated manner. Policy makers should invest in the development of integrated interventions for IPV and evaluate whether they lead to better health outcomes for children, particularly in settings with limited human and financial resources.

The study highlights the importance of investing in the primary prevention of IPV. Reducing IPV has the potential to reduce negative health outcomes among children living in households with IPV. Systematically implementing policies to target major risk factors for IPV, such as strengthening access to education for girls and economic empowerment of women has proven to be effective in reducing IPV (36).

Limitations

Given the large heterogeneity across studies, we recommend caution in drawing conclusions about a global estimate for childhood exposure to IPV. The pooled estimate of the random effects model cannot be interpreted as universal true effect; rather it is the average of survey-specific estimates.

The items that were used to measure childhood exposure to IPV varied between studies. In most studies, measures were used without appropriate cross-cultural validation and adaptation such that comparability of prevalence estimates has limitations.

The majority of the study populations were adults aged 18 and older, who were asked about IPV exposure in their own childhood. Research on other types of child maltreatment and family discord suggests that such retrospective data may be subject to recall bias, which can lead to a systematic under-estimation of the prevalence (37).

There is substantial variability in the tools and a lack of consensus about the domains that should be assessed in risk of bias assessments of prevalence studies (38). Although the interrater reliability was high in the present study and previous studies (18), we noted possible limitations in the application of Hoy et al.'s risk of bias tool. Some dimensions, which can influence bias were not assessed. These include the sample size and the sampling procedure, which were not assessed in sufficient detail. Sampling

techniques can still differ largely in terms of their representativeness. Some studies did not report whether a sample was drawn from the entire population of a country or from a sub-national administrative entity. Underreporting of the applied research methods, which is common, can result in certain domains not being assessed, which can lead to a falsely elevated risk of bias rating.

Many of the estimates were collected from studies whose primary purpose was not the measurement of childhood exposure to IPV. We derived the estimates from general health surveys, such as Demographic and Health Surveys (DHS), studies on Adverse Childhood Experiences (ACE's), or from studies that assessed risk factors for other health conditions. If childhood exposure to IPV or child maltreatment was not reported in the abstract or the full text, the study would not have been identified, which could have led to a risk of bias at the review level.

Conclusion

We conclude that the exposure of children to IPV is highly prevalent in low-income and lower-middle-income countries. The pooled prevalence mirrors global estimates of IPV. From a large number of studies, including those performed in lower-income countries, we know that childhood exposure to IPV can lead to severe and long-lasting health and social consequences. Therefore, healthcare and social care providers should be able to recognize child exposure to IPV, provide first line support, including psychosocial support, address associated mental health consequences and link exposed children with other support services to prevent subsequent impairment.

We believe that the lack of consensus in defining and measuring childhood exposure to IPV is contributing to large variations in reported prevalence rates. Better agreement about definitions and the operationalization of childhood exposure to IPV as well as consistent use of instruments would be an important step in improving measurement and the ability to compare outcomes.

The findings of this study strengthen the case for further efforts to address childhood exposure to IPV including in low-income and lower-middle-income countries. Considering the severe and long-lasting health and social consequences, the health sector, in collaboration with other sectors, has an important role in raising awareness and addressing the consequences of children's exposure to IPV.

Footnotes

Contributorship statement

BK developed the research questions. All authors made substantial contributions to the research protocol. BK conducted the searches. BK and MK screened the papers for inclusion and extracted the data for the analysis. MK provided detailed guidance throughout the review process. BK performed the data analysis. TP provided advice on research methods and verified the analytical methods. BK took the lead in writing the manuscript. All authors provided critical feedback and helped shape the research, analysis and draft manuscript. TP and HM provided overall guidance and supervision. All authors approved the final version of the manuscript and agree to be accountable for all aspects of the work and ensure that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Competing interests

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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Data availability statement

All data relevant to the study are included in the article or uploaded as online supplemental information.

Research Ethics Approval

The study is a systematic review of existing prevalence data, for which informed consent was obtained by primary investigators, and did not require ethics approval.

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Figure legends/captions

Figure 1: PRISMA Flowchart of studies identified, included and excluded

Figure 2: Box-plot of the lifetime prevalence of childhood exposure to IPV disaggregated by gender

Figure 3: Pooled prevalence for childhood exposure to IPV in low-income and lower-middle income countries disaggregated by WHO region

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Figure 1
PRISMA Flowchart of studies identified, included and excluded

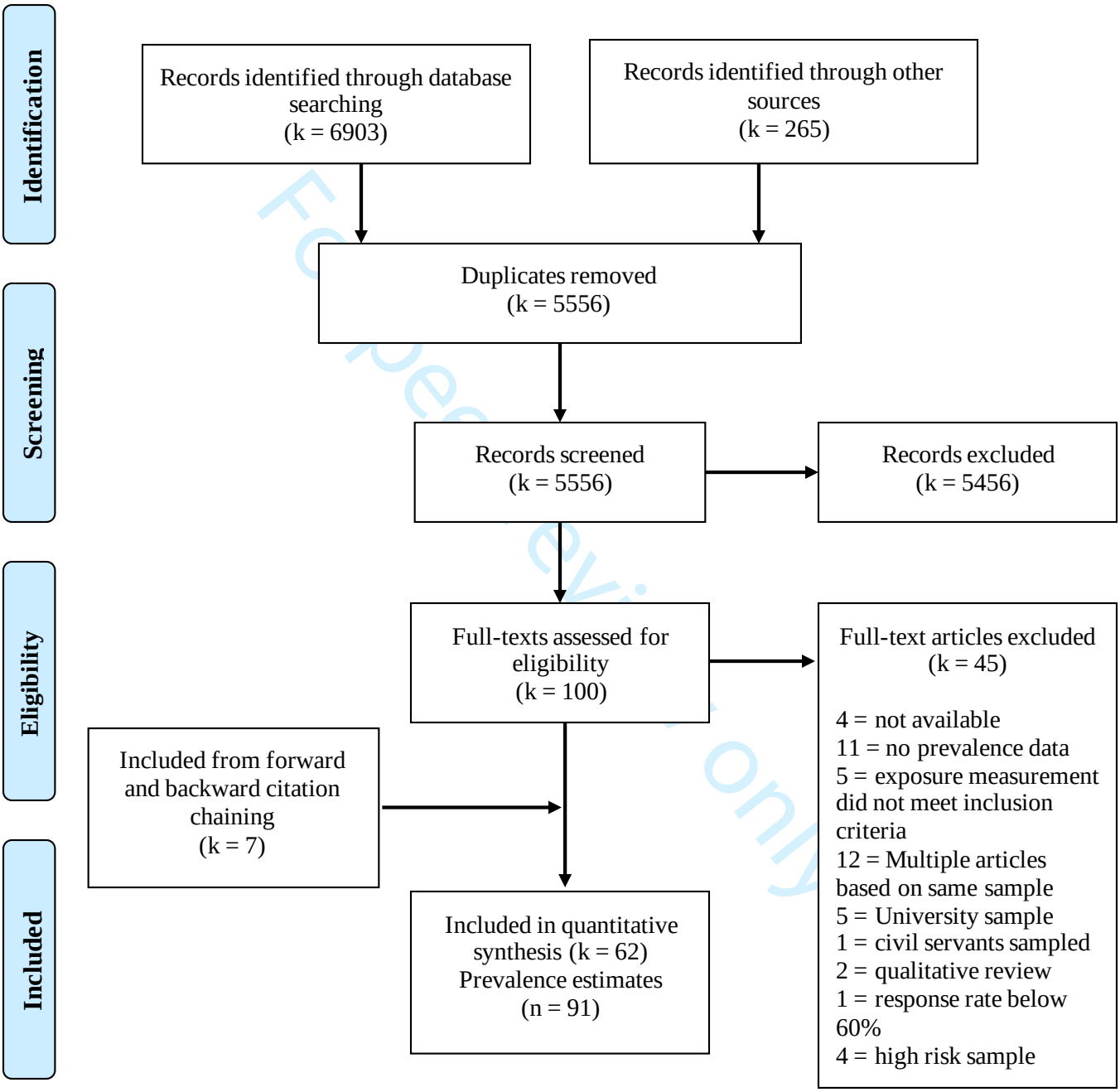


Figure 2

Box-plot of the lifetime prevalence of childhood exposure to IPV disaggregated by gender

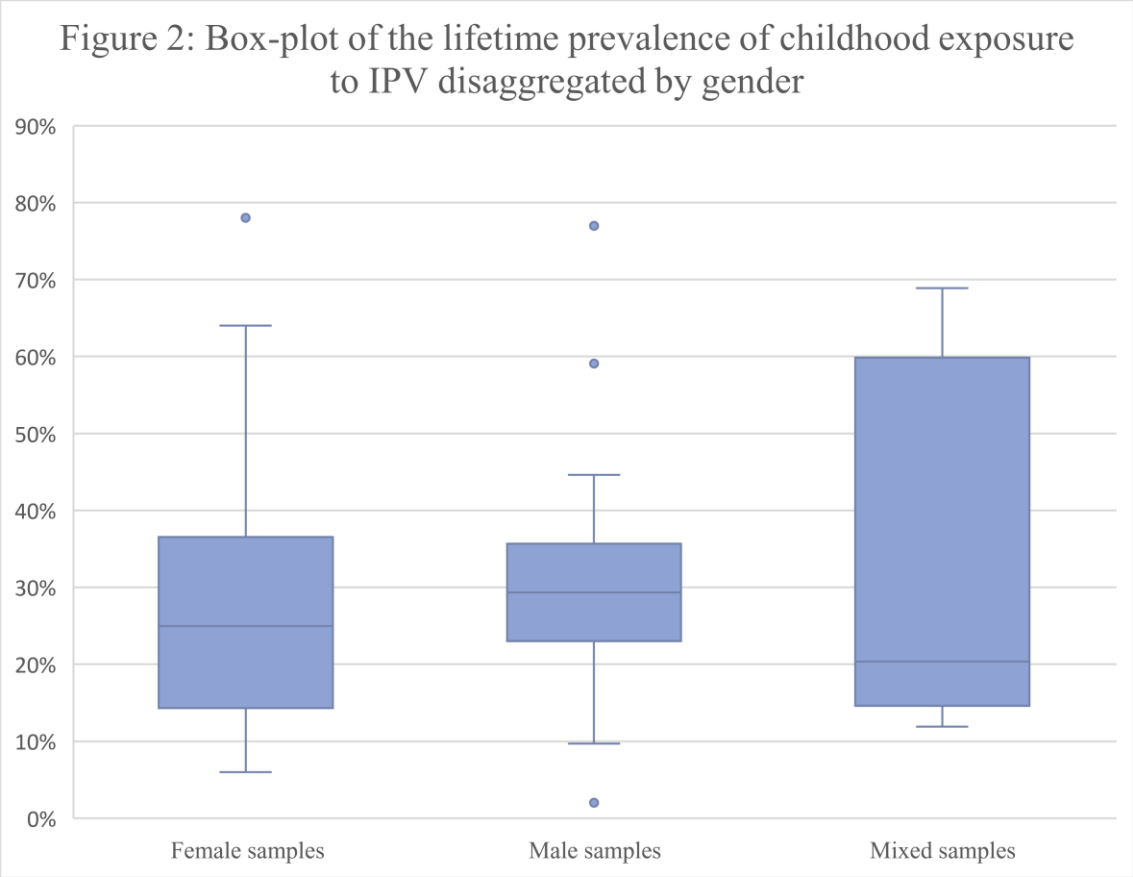
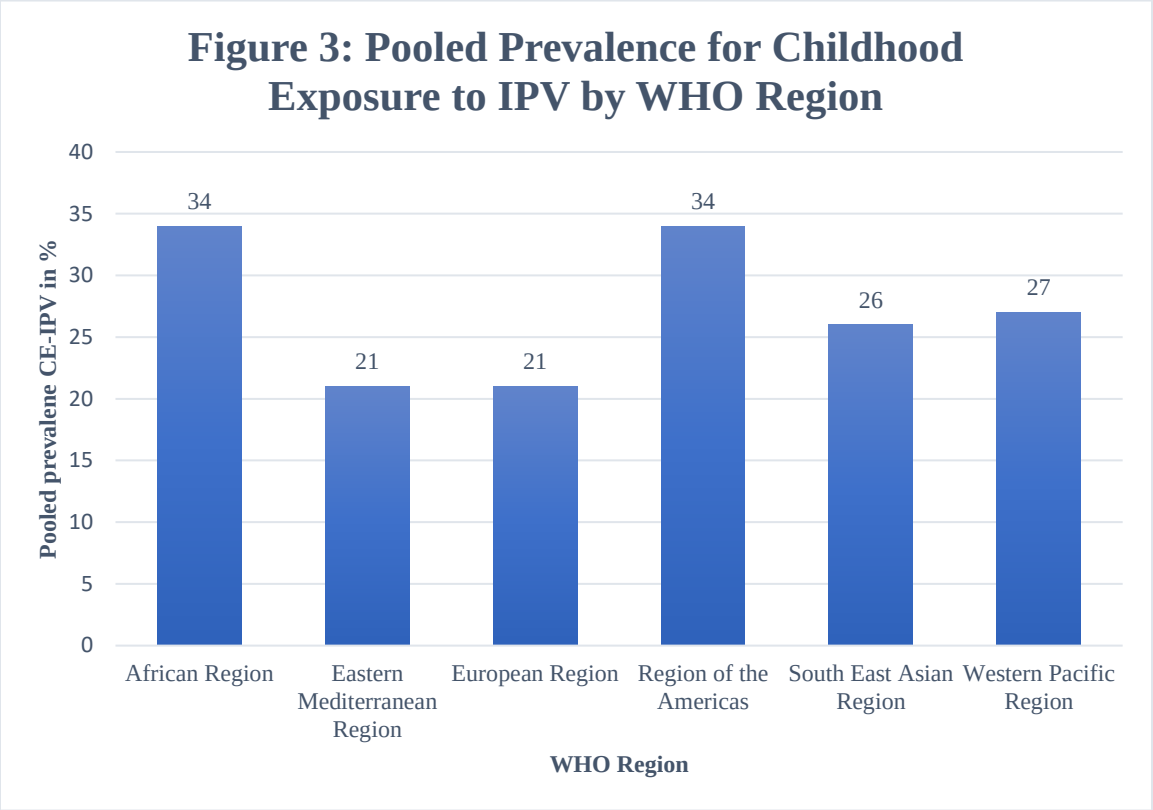


Figure 3

Pooled prevalence for childhood exposure to IPV in low-income and lower-middle income countries disaggregated by WHO region



Supplementary Material 2

Search strategy: Prevalence of childhood exposure to intimate partner violence in low-income and lower-middle-income countries: a systematic review and meta-analysis

1. Research questions

1) What is the lifetime prevalence of childhood exposure to IPV among children and adults in low-income and lower-middle-income countries?

2) What is the past-year prevalence of exposure to IPV among children in low-income and lower-middle-income countries?

2. Components of the search strategy as per protocol

1) Electronic databases: PubMed, Web of Science, WHO Global Index Medicus, CINAHL, ERIC, PsycINFO, Violence and Abuse Abstracts

2) Searches in specialized journals in particular Child Abuse and Neglect, Trauma, Violence & Abuse, Child Maltreatment.

3) Searches for relevant studies in the citations of other systematic reviews and meta-analyses.

4) Forward and backward citation chaining of included papers.

3. Global search strategy

prevalence OR epidemiol* OR cross-sectional OR survey

AND

child* OR adolescen* OR girls OR boys OR infant* OR baby OR babies OR toddler* OR preschool* OR pre-school* OR young person OR young people OR minor OR teen* OR youth*

AND

domestic violence OR parental violence OR intimate partner violence OR psychological abuse OR emotional abuse OR ((caregiver OR marital OR conjugal OR spous* OR husband OR wife OR women OR woman OR man OR men) AND (violence OR abuse OR victim* OR battered))

AND

witness* OR 'growing up' OR expos* OR poly-victimization OR poly-victimisation

4. Search strategy adapted for PubMed

PubMed Search using MeSH terms

(("Intimate Partner Violence"[Mesh] OR (("Domestic Violence"[Mesh] OR "Battered Women"[Mesh]) OR "Spouse Abuse"[Mesh])) AND (("Child"[Mesh] AND "Child, Preschool"[Mesh]) OR "Adolescent"[Mesh])) AND "Prevalence"[Mesh]

PubMed Search using Keywords

(prevalence) AND (((((child* OR adolescen* OR girl* OR boy* OR infant* OR baby OR babies OR toddler* OR preschool* OR pre-school* OR young person* OR young people OR minor* OR teen* OR adolescen* OR youth*))) AND (((domestic OR parental OR caregiver OR intimate partner OR marital OR conjugal OR spous* OR husband OR wife)) AND (violence OR abus* OR victim*))) AND ((witness* OR expos* OR growing up OR poly-victimisation OR poly-victimization)))

Combined PubMed Search using Keywords and MeSH terms

((((((("Intimate Partner Violence"[Mesh]) OR ((("Domestic Violence"[Mesh]) OR "Battered Women"[Mesh]) OR "Spouse Abuse"[Mesh]))) AND (("Child"[Mesh] AND "Child, Preschool"[Mesh]) OR "Adolescent"[Mesh])) AND "Prevalence"[Mesh])) OR ((prevalence) AND (((((child* OR adolescen* OR girl* OR boy* OR infant* OR baby OR babies OR toddler* OR preschool* OR pre-school* OR young person* OR young people OR minor* OR teen*))) AND (((domestic OR parental OR caregiver OR intimate partner OR marital OR conjugal OR spous* OR husband OR wife)) AND (violence OR abus* OR victim*))) AND ((witness* OR exposure OR growing up OR poly-victimisation OR poly-victimization))))

5. Search strategy adapted for Web of Science

Settings:

- Advanced search
- Web of Science Core Collection
- Timespan All years (1945-2019)

Note: Core Collection employs no **controlled vocabulary** or thesaurus in assigning subject terms. Natural language indexing (where every word in the title is searchable) is used.

Search strategy:

ALL FIELDS: (prevalence OR epidemiol* OR cross-sectional OR survey)

AND **ALL FIELDS:** (child* OR adolescen* OR girls OR boys OR infant* OR baby OR babies OR toddler* OR preschool* OR pre-school* OR young person OR young people OR minor OR teen* OR adolescen* OR youth*)

AND **ALL FIELDS:** (domestic violence OR parental violence OR intimate partner violence OR psychological abuse OR emotional abuse OR (caregiver OR marital OR conjugal OR spous* OR husband OR wife OR women OR woman OR man OR men) AND (violence OR abuse OR victim* OR battered))

AND **ALL FIELDS:** (witness* OR 'growing up' OR expos* OR poly-victimization OR poly-victimisation)

6. PsycINFO

Any Field: prevalence OR Any Field: epidemiol* OR Any Field: cross-sectional OR Any Field: survey AND Any Field: child* OR Any Field: adolescen* OR Any Field: girls OR Any Field: boys OR Any Field: infant* OR Any Field: baby OR Any Field: babies OR Any Field: toddler* OR Any Field: preschool* OR Any Field: pre-school* OR Any Field: young person OR Any Field: young people OR Any Field: minor OR Any Field: teen* OR Any Field: youth* AND Any Field: domestic violence OR Any Field: parental violence OR Any Field: intimate partner violence OR Any Field: psychological abuse OR Any Field: emotional abuse OR (Any Field: caregiver OR Any Field: marital OR Any Field: conjugal OR Any Field: spous* OR Any Field: husband OR Any Field: wife OR Any Field: women OR Any Field: woman OR Any Field: man OR Any Field: men) AND (Any Field: violence OR Any Field: abuse OR Any Field: victim* OR Any Field: battered)) AND Any Field: witness* OR Any Field: 'growing up' OR Any Field: exposure OR Any Field: expose* OR Any Field: poly-victimization OR Any Field: poly-victimisation

7. Global Index Medicus

(tw:(prevalence OR epidemiol* OR cross-sectional OR survey)) AND (tw:(child* OR adolescen* OR girls OR boys OR infant* OR baby OR babies OR toddler* OR preschool* OR pre-school* OR young person OR young people OR minor OR teen* OR youth*)) AND (tw:(domestic violence OR parental violence OR intimate partner violence OR psychological abuse OR emotional abuse OR ((caregiver OR marital OR conjugal OR spous* OR husband OR wife OR women OR woman OR man OR men) AND (violence OR abuse OR victim* OR battered)))) AND (tw:(witness* OR 'growing up' OR exposure OR expose* OR poly-victimization OR poly-victimisation)) AND (instance:"ghl")

Supplementary Material 3

Characteristics of studies included in meta-analysis

Author & Year	Country	National or sub-national sample	Gender	Age range / median age	Sample Source	Sampling procedure	Sample Size	CE-IPV Prevalence rate (%)	Type of witnessed violence	Reference frame	Risk of Bias
Abramsky 2011 (1)	Bangladesh	sub-national	female	15;49	household	two stage cluster sample	934	9%	physical	lifetime	low
Abramsky 2011 (1)	Bangladesh	sub-national	female	15;49	household	two stage cluster sample	1053	4%	physical	lifetime	low
Abramsky 2011 (1)	Ethiopia	sub-national	female	15;49	household	two stage cluster sample	1873	4%	physical	lifetime	low
Abramsky 2011 (1)	Peru	sub-national	female	15;49	household	two stage cluster sample	1008	9%	physical	lifetime	low
Abramsky 2011 (1)	Peru	sub-national	female	15;49	household	two stage cluster sample	746	7%	physical	lifetime	low
Abramsky 2011 (1)	Samoa	sub-national	female	15;49	household	two stage cluster sample	932	2%	physical	lifetime	low
Abramsky 2011 (1)	Tanzania	sub-national	female	15;49	household	two stage cluster sample	922	7%	physical	lifetime	low
Abramsky 2011 (1)	Tanzania	sub-national	female	15;49	household	two stage cluster sample	1169	9%	physical	lifetime	low
Abramsky 2011 (1)	Thailand	sub-national	female	15;49	household	two stage cluster sample	781	5%	physical	lifetime	low
Abramsky 2011 (1)	Thailand	sub-national	female	15;49	household	two stage cluster sample	848	6%	physical	lifetime	low
Alangea 2018 (2)	Ghana	sub-national	female	18;49	household	simple random	2000	4%	physical	lifetime	low
Alizzy 2017 (3)	Yemen	sub-national	female	11;16	school	simple random	303	3%	physical	lifetime	low
Alizzy 2017 (3)	Yemen	sub-national	male	11;16	school	simple random	295	4%	physical	lifetime	low
Ameli 2017 (4)	Malawi	sub-national	female	10;19	school	convenience sample	281	28%	physical and emotional	lifetime	moderate

Ameli 2017 (4)	Malawi	sub-national	male	10;19	school	convenience sample	280	10%	physical and emotional	lifetime	moderate
Amir-ud-Din 2018 (5)	Pakistan	national	female	15;49	household	multi-stage cluster sample	3265	31%	physical	lifetime	low
Antai 2016 (6)	Egypt	national	female	15;49	household	multi-stage cluster sample	4144	21%	physical	lifetime	low
Atiqul 2019 (7)	Bangladesh	sub-national	mixed	11;17	household	simple random	1416	20%	physical	lifetime	low
Atteraya 2015 (8)	Nepal	national	female	15;49	household	multi-stage cluster sample	3373	17%	physical	lifetime	low
Chirwa 2018 (9)	Ghana	sub-national	male	39.5	household	multi-stage cluster sample	1973	38%	physical	lifetime	low
Clark 2019 (10)	Nepal	sub-national	female	19;49	household	multi-stage cluster sample	1800	31%	physical	lifetime	low
Das 2014 (11)	India	sub-national	male	10;16	school	convenience sample	1040	12%	physical and emotional	lifetime	moderate
Deb 2016 (12)	India	sub-national	female	15;18	school	convenience sample	188	15%	physical and emotional	past year	moderate
Deb 2016 (12)	India	sub-national	male	15;18	school	convenience sample	182	12%	physical and emotional	past year	moderate
Devries 2017 (13)	Uganda	sub-national	female	11;14	school	stratified multi-stage cluster sample	1658	37%	physical and emotional	lifetime	low
Devries 2017 (13)	Uganda	sub-national	male	11;14	school	stratified multi-stage cluster sample	1572	17%	physical and emotional	lifetime	low
Dibaba 2008 (14)	Ethiopia	sub-national	female	31.8	community	simple random	308	14%	physical	lifetime	low
Fawole 2018 (15)	Nigeria	sub-national	mixed	10;21	school	stratified multi-stage cluster sample	640	9%	unclear	lifetime	moderate
Fleming 2015 (16)	Democratic Republic of the Congo	sub-national	male	18;59	household	random sample, stratified by age and province	539	4%	physical	lifetime	low
Fleming 2015 (16)	Rwanda	sub-national	male	18;59	household	random sample, stratified by age and	1456	5%	physical	lifetime	low
Gage 2005 (17)	Haiti	national	female	15;49	household	two-stage stratified cluster sample	2564	2%	physical	lifetime	low

Gage 2015 (18)	Haiti	sub-national	female	>=14	school	convenience sample	187	9%	physical	lifetime	moderate
Gage 2015 (18)	Haiti	sub-national	male	>=14	school	convenience sample	155	0%	physical	lifetime	moderate
Gautam 2019 (19)	Nepal	national	female	15;49	household	multi-stage cluster sample	3562	4%	physical	lifetime	low
Goodman 2017 (20)	Kenya	sub-national	female	18;89	household	simple random	1966	8%	physical	lifetime	low
Hayati 2011 (21)	Indonesia	sub-national	male	15;49	household	multi-stage cluster sample	765	2%	physical	lifetime	low
Hayes 2018 (22)	Kyrgyz Republic	national	female	15;49	household	two-stage stratified cluster sample	3171	5%	physical	lifetime	low
Hayes 2018 (22)	Moldova	national	female	15;49	household	two-stage stratified cluster sample	3355	5%	physical	lifetime	low
Hayes 2018 (22)	Tajikistan	national	female	15;49	household	two-stage stratified cluster sample	3093	4%	physical	lifetime	low
Islam 2014 (23)	Bangladesh	national	female	15;49	household	stratified multi-stage cluster sample	3910	6%	physical	lifetime	low
Islam 2017 (24)	Bangladesh	national	male	18;54	household	stratified multi-stage cluster sample	3374	7%	physical	lifetime	low
James-Hawkins 2018 (25)	Bangladesh	sub-national	male	18;34	household	stratified multi-stage cluster sample	570	2%	physical	lifetime	low
Jeyaseelan 2004 (26)	Egypt	sub-national	female	15;49	household	simple random	631	6%	physical	lifetime	low
Jeyaseelan 2004 (26)	India (Lucknow)	sub-national	female	15;49	household	simple random	506	6%	physical	lifetime	low
Jeyaseelan 2004 (26)	India (Trivandru	sub-national	female	15;49	household	simple random	700	9%	physical	lifetime	low
Jeyaseelan 2004 (26)	India (Vellore)	sub-national	female	15;49	household	simple random	716	1%	physical	lifetime	low
Jeyaseelan 2004 (26)	Philippines	sub-national	female	15;49	household	simple random	1000	7%	physical	lifetime	low
Jirapramukpitak 2005 (27)	Thailand	sub-national	female	16;25	household	simple random	199	8%	physical	lifetime	low
Jirapramukpitak 2005 (27)	Thailand	sub-national	male	16;25	household	simple random	144	0%	physical	lifetime	low
Kinyanda 2013 (28)	Uganda	sub-national	mixed	3;19[1]	household	multi-stage cluster sample	1587	7%	physical and	lifetime	moderate
Kwagala 2013 (29)	Uganda	national	female	15;49	household	stratified multi-stage cluster sample	1307	2%	physical	lifetime	low

Laeheem 2009 (30)	Thailand	sub-national	mixed	8;11	school	random sample, stratified by school	1440	50%	physical	lifetime	low
Lakhdir 2017 (31)	Pakistan	sub-national	mixed	11;17	household	multi-stage cluster sample	800	35%	physical	lifetime	low
Le 2015 (32)	Vietnam	sub-national	mixed	16.5	school	two-stage stratified cluster sample	1606	12%	physical	lifetime	low
Lui 2018 (33)	Solomon Islands	sub-national	male	18;70	household	multi-stage cluster sample	400	27%	physical and emotional	lifetime	low
Mandal 2015 (34)	Philippines	sub-national	female	21;22	household	one-stage cluster sample	892	33%	physical	lifetime	low
Mandal 2015 (34)	Philippines	sub-national	male	21;22	household	one-stage cluster sample	989	36%	physical	lifetime	low
Martin 2002 (35)	India	sub-national	male	not reported	household	multi-stage cluster sample	6902	11%	physical	lifetime	low
Maxwell 2003 (36)	Philippines	sub-national	female	not reported	school	multi-stage cluster sample	685	40%	physical	past year	moderate
Maxwell 2003 (36)	Philippines	sub-national	male	not reported	school	multi-stage cluster sample	694	37%	physical	past year	moderate
Meekers 2013 (37)	Bolivia	national	female	15;49	household	multi-stage cluster sample	10119	24%	physical	lifetime	low
Ndetei 2007 (38)	Kenya	sub-national	mixed	12;26	school	convenience sample	1110	17%	unclear	lifetime	moderate
Neupane 2018 (39)	Nepal	sub-national	mixed	12;18	school	cluster-sample	962	9%	unclear	lifetime	low
Neupane 2018 (39)	Nepal	sub-national	mixed	12;18	school	cluster-sample	962	7%	unclear	past year	low
Ogum 2018 (40)	Ghana	sub-national	female	18;49	household	multi-stage stratified cluster sample	2000	4%	physical	lifetime	low
O'Leary 2008 (41)	Ukraine	national	female	46 (median	household	multi-stage cluster sample	558	7%	physical and	lifetime	low
O'Leary 2008 (41)	Ukraine	national	male	46 (median	household	multi-stage cluster sample	558	2%	physical and	lifetime	low
Onigbogi 2015 (42)	Nigeria	sub-national	female	18;65	household	multi-stage cluster sample	400	9%	physical	lifetime	low
Owusu 2016 (43)	Ghana	national	female	15;49	household	multi-stage cluster sample	1524	2%	physical	lifetime	low
Pallitto 2008 (44)	El Salvador	national	female	15;24	household	multi-stage probabilistic random sample	3753	6%	physical	lifetime	low

Panter-Brick 2011 (45)	Afghanistan	sub-national	mixed	11;16	school	stratified random sample	234	57%	physical	past year	low
Ramiro 2010 (46)	Philippines	sub-national	female	46.7	household	simple random	533	24%	physical	lifetime	low
Ramiro 2010 (46)	Philippines	sub-national	male	46.7	household	simple random	535	32%	physical	lifetime	low
Reese 2017 (47)	Tanzania	national	female	15;49	household	two-stage cluster sample	4975	11%	physical	lifetime	low
Sabri 2014 (48)	India	national	female	15;49	household	nationally representative	67226	20%	physical	lifetime	low
Solanke 2018 (49)	Nigeria	national	female	15;49	household	stratified three-stage cluster sample	19924	8%	physical	lifetime	low
Speizer 2010 (50)	Uganda	national	female	15;49	household	multi-stage cluster sample	1749	48%	physical	lifetime	low
Speizer 2010 (50)	Uganda	national	male	14;54	household	multi-stage cluster sample	1318	39%	physical	lifetime	low
Tenkorang 2013 (51)	Ghana	national	female	15;45	household	two-stage cluster sample	1835	33%	physical	lifetime	low
Tenkorang 2018 (52)	Ghana	national	female	38	household	two-stage cluster sample	2289	6%	unclear	lifetime	low
Thomson 2015 (53)	Rwanda	national	female	15;49	household	two-stage cluster sample	4066	2%	physical	lifetime	low
Tiruneh 2018 (54)	Democratic Republic of the Congo	national	female	15;49	household	stratified two-stage cluster sample	5120	7%	physical	lifetime	low
Tran 2017 (55)	Vietnam	sub-national	female	12;17	school	cluster-sample	975	24%	physical	lifetime	low
Tran 2017 (55)	Vietnam	sub-national	male	12;17	school	cluster-sample	876	23%	physical	lifetime	low
Uthman 2011 (56)	Nigeria	national	female	20;44	household	two-stage cluster sample	8731	10%	physical	lifetime	low
VanderEnde 2016 (57)	Malawi	national	male	18;24	household	four-stage cluster sample	447	2%	physical	lifetime	low
Vung 2009 (58)	Vietnam	sub-national	female	17;60	household	stratified cluster sample	730	6%	physical	lifetime	low
Wahdan 2014 (59)	Egypt	sub-national	mixed	11;19	household	multi-stage cluster sample	783	4%	physical	lifetime	low
Yount 2016 (60)	Vietnam	sub-national	female	18;50	household	cluster-sample	533	6%	physical	lifetime	low

Yount 2016 (61)	Vietnam	sub-national	male	18;51	household	cluster-sample	522	57%	physical	lifetime	low
Yount 2018 (62)	Bangladesh	sub-national	male	18;49	household	cluster-sample, probability	1508	69%	physical	lifetime	low

[1] Caregivers interviewed for those <10

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PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	3
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	1
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	3
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS). *Note: Systematic review of prevalence, interventions and comparisons n.a.*	3
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	1 and 4
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	4
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	4
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Suppl. 2
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	4
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	5
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	3/4
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	5/6
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	3/4
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	6

PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	5
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	7
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	Figure 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	Suppl. 3
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	Suppl. 3
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	Suppl. 3
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	7
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	n/a
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	7
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	7/8
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	10
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	10
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	Cover page

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