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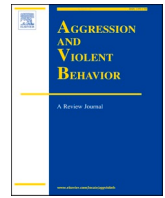
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Interventions to reduce intimate partner violence against women in low- and middle-income countries: A meta-analysis

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ABSTRACT

Globally, one in four women experience intimate partner violence (IPV) at some point in their life. This is particularly prevalent in low-and middle-income countries (LMICs), highlighting the need to understand how IPV can be reduced. Our aim was to summarize the evidence base for interventions to reduce IPV in LMICs. We searched for studies published in peer-reviewed journals in PsycINFO, PubMed, and Web of Science from January 1st 2012 to November 29th 2021, and included studies that evaluated interventions directed at IPV in LMICs, targeted at individuals in intimate relationships. Effect sizes were analyzed in a three-level meta-analysis. Forty-eight interventions were identified and the approaches employed fall within five of the seven domains of the WHO RESPECT Framework. The overall effects of interventions on participants' attitudes toward IPV and on IPV behavior were small and non-significant (attitudes: $d = -0.302$, 95% CI $-0.635-0.032$; behavior: $d = -0.077$, 95% CI $-0.165-0.009$). Heterogeneity in effects was substantial, suggesting that some interventions were more effective than others. The number of interventions available show that progress is being made to generate evidence in LMICs, but a lot more needs to be done in developing and implementing effective interventions to reduce IPV.

1. Introduction

Intimate partner violence (IPV) is a major public health and human rights problem with serious consequences for the victim's physical, mental, sexual and reproductive health (Abramsky et al., 2014; Antai & Adaji, 2012; Balogun & John-Akinola, 2015). It is any behavior within an intimate relationship that causes physical, sexual or psychological harm (Lövestad et al., 2017; Tol et al., 2019). This includes acts of physical aggression, sexual coercion, psychological abuse and controlling behaviors directed at the victim who can be a man or a woman, but IPV against men is less prevalent and less severe than IPV against women (Alangea et al., 2018; Dillon et al., 2013; Tran et al., 2016). Globally, one in four women have experienced IPV at some point in their lives and it is particularly prevalent and burdensome for women in low- and middle-income countries (LMICs), where patriarchal sociocultural and religious values as well as political systems condone the violation of women's rights (Cao et al., 2021; Tran et al., 2016; World Health

Organization, 2021). The sheer impact and magnitude of this problem highlight the need to improve our understanding of how IPV can be reduced in LMICs, where evidence for IPV prevention remains limited but is on the rise (Gottert et al., 2020). The United Nations (UN) had declared the need to strengthen the knowledge base on violence against women to inform policy and strategy development (Argento et al., 2014). In addition, prevention practitioners and researchers have been developing and testing interventions to prevent IPV and have been expanding knowledge which is broadening the evidence base on what works in IPV prevention (Jewkes et al., 2020; Kerr-Wilson et al., 2020).

Numerous factors, at the macro social, community, interpersonal, and individual levels put women at risk of IPV. At the macro social level, these include gender inequality (e.g., economic rights and discriminatory family laws), cultural factors (e.g., a gender value emphasis on purity), and economic factors (e.g., a country's development status). At the community level, there are harmful norms (e.g., the acceptability of wife beating), and neighborhood factors (e.g., crime, poverty, and

Abbreviations: IPV, Intimate partner violence; LMIC, **Low- and middle-income countries**; UN, United Nations; RCT, Randomized controlled trials; WHO, World Health Organization; DHS, Demographic and Health Survey; GEMS, Gender Equitable Men Scale.

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unemployment levels). While at the interpersonal and individual level, factors like being abused or having witnessed IPV during childhood, and alcohol or other harmful substances abuse put women at risk of IPV (Contreras-Urbina et al., 2016; Mannell et al., 2022). These risk factors often co-occur and interact, amplifying each other's effect on IPV and can therefore be difficult to design interventions to effectively prevent IPV, because many interventions can alleviate only some risk factors, and not others (Bazargan-Hejazia et al., 2013). Yet, the need for effective interventions to prevent IPV, especially in communities with the highest risk for IPV, is evident.

Interventions to reduce intimate partner violence tend to adopt either a structural or behavioral approach (Bourey et al., 2015). Structural interventions aim to change macro level factors, including the economic, politico-legal, physical, and social environment that produce and reproduce risk. Consistent with a socio-ecological understanding of IPV risks, such interventions modify systems, structures, and processes at the highest level of the social ecology in order to ameliorate risks at multiple levels. Behavioral interventions aim to change individuals including group experiences and individual agency. Many interventions in LMICs are behavioral, including economic empowerment programs such as microfinance, cash transfers, livelihood training, women-centered support services, couple-focused education, participatory learning and community mobilization, educational entertainment, and combinations of economic and social approaches (Arango et al., 2014; Bourey et al., 2015; Ellsberg et al., 2015; Heise & Fulu, 2014; World Health Organization/London School of Hygiene and Tropical Medicine, 2010). Many of these interventions are captured in the WHO R.E.S.P.E. C.T framework, which contains a set of action-oriented steps that enables monitoring and evaluation of interventions and programs using seven strategies to prevent violence (WHO, 2019). Still within the behavioral approach are interventions that are gender transformative, which is a term used to describe programs seeking to increase gender equity, and to inspire governments, organizations, and individuals engaged in this work to embrace gender relations at the core (Casey et al., 2018).

Fortunately, research on the effect of interventions to reduce IPV in LMICs has developed rapidly in the past few years, although the What Works to Prevent Violence Against Women and Girls Global review noted that there were no sets of interventions that were found to have a good evidence base. A good number of interventions were identified to be promising or effective but needing some form of improvement in terms of quality and quantity of the evidence (Kerr-Wilson et al., 2020). In this meta-analysis, we assess the effect of interventions on changes in attitudes toward IPV and on reduced IPV behavior. We focus on attitudes toward IPV (i.e., the tendency to evaluate IPV with some degree of favor or disfavor) because although holding a favorable attitude towards violence is not the same as actually committing IPV, an attitude of IPV acceptance is one of the strongest predictors of actual IPV behavior (Eckenrode, 2018). We also focus on IPV behavior because reducing this is the ultimate goal of most interventions targeting IPV (Marshall et al., 2018). Interventions encouraging gender-equitable behaviors and beliefs are among the most widespread and prominent forms of preventing IPV but this evidence, also needs to be strengthened (Vaillant et al., 2020). The aim of this study was thus to summarize the evidence base for interventions to reduce IPV in LMICs.

2. Methods

2.1. Eligible studies

We sought to include studies that (1) quantitatively evaluated interventions to reduce IPV (2) targeted at individuals (15 years and above) in intimate relationships in LMICs as defined by The World Bank, countries with less than \$3895 Gross National Income per Capita (World Bank, 2021). Interventions designed for unmarried adolescents or adolescents not in union were not included to limit the level of

Table 1

Literature search strategies for interventions to reduce intimate partner violence against women in low- and middle-income countries.

S/ N	Database	Search strategy	Search results
1	PsycINFO	<p>#1 Intimate partner violence intimate partner violence/OR battered females/OR domestic violence/OR partner abuse/OR (((abus* OR batter* OR beating OR violence OR rape) ADJ3 (boyfriend* OR female* OR girlfriend* OR husband* OR marriage OR married OR marital OR partner OR spous* OR wife OR wom#n OR wives)) OR acid attack* OR acid throwing OR ((batter* OR beating) ADJ3 (man OR men)) OR coerced sex OR ((couple OR domestic OR relationship*) ADJ1 (abuse OR abusive OR violence)) OR dating violence OR femicide OR feminicide OR gender based violence OR gender violence OR intimate terrorism OR rape* OR sexual abus* OR sexual assault* OR sexual violence OR unwanted sex).ti,ab,id.</p> <p>#2 interventions intervention/OR program development/OR program evaluation/OR health promotion/OR treatment effectiveness/OR (evaluat* OR health promotion OR intervention* OR program* OR quasi-experiment* OR quasiexperiment* OR RCT* OR treatment* OR trial*).ti,ab,id.</p> <p>#3 low and middle income countries developing countries/OR (developing countr* OR low income countr* OR middle income countr* OR afghanistan OR albania OR algeria OR angola OR argentina OR armenia OR azerb* OR bahrain OR bangladesh OR belarus OR belize OR benin OR bhutan OR bolivia OR bosnia OR botswana OR brazil OR bulgaria OR burkina OR burma OR burundi OR cambodia OR cameroon OR africa* OR cabo verde OR cape verde OR chad OR china OR colombia OR comoros OR congo OR costa rica OR cote d'ivoire OR ivory coast OR croatia OR cuba OR djibouti OR dominica OR dominican republic OR ecuador OR egypt OR el salvador OR eritrea OR ethiopia OR fiji OR gabon OR gambia OR georgia OR ghana OR greece OR grenada OR guatemala OR guinea OR guyana OR haiti OR honduras OR india OR indonesia OR iran OR iraq OR jamaica OR jordan OR kazakhstan OR kenya OR kiribati OR korea OR kosovo OR kuwait OR kyrgyz* OR lao OR laos OR lebanon OR lesotho OR liberia OR libya OR macedonia OR madagascar OR malawi OR malaysia OR maldives OR mali OR marshall islands OR mauritius OR mexico OR micronesia OR moldova OR mongolia OR montenegro OR morocco OR mozambique OR myanmar OR namibia OR nauru OR nepal OR nicaragua OR niger OR nigeria OR oman OR pakistan OR palest* OR palau OR panama OR paraguay OR peru OR philippines OR romania OR russia* OR rwanda OR samoa OR "sao tome and prince" OR saudi arabia OR senegal OR serbia OR seychelles OR sierra leone OR solomon islands OR somalia OR sri lanka OR st* lucia OR sudan OR surinam* OR swaziland OR syria* OR tajikistan OR tanzania OR thailand OR timor OR togo OR tonga OR "trinidad and tobago" OR tunisia OR turkey OR turkmenistan OR tuvalu OR uganda OR ukraine OR united arab emirates OR uzbekistan OR vanuatu OR venezuela OR vietnam OR "vincent and the grenadines" OR</p>	2485

(continued on next page)

Table 1 (continued)

S/ N	Database	Search strategy	Search results
2	Ovid MEDLINE®	<p>west bank OR gaza OR yemen OR zambia OR zimbabwe).ti,ab,id,hw.</p> <p>#1 Intimate partner violence intimate partner violence/OR battered women/OR domestic violence/OR spouse abuse/OR (((abus* OR batter* OR beating OR violence OR rape) ADJ3 (boyfriend* OR female* OR girlfriend* OR husband* OR marriage OR married OR marital OR partner OR spous* OR wife OR wom#n OR wives)) OR acid attack* OR acid throwing OR ((batter* OR beating) ADJ3 (man OR men)) OR coerced sex OR ((couple OR domestic OR relationship*) ADJ1 (abuse OR abusive OR violence)) OR dating violence OR femicide OR femicide OR gender based violence OR gender violence OR intimate terrorism OR sexual abus* OR sexual assault* OR sexual violence OR unwanted sex). ti,ab,kf.</p> <p>#2 interventions program development/OR program evaluation/OR health promotion/OR treatment effectiveness/OR randomized controlled trials as topic/OR randomized controlled trial/OR (evaluat* OR health promotion OR intervention* OR program* OR quasi-experiment* OR quasiexperiment* OR RCT* OR treatment* OR trial*).ti,ab,kf.</p> <p>#3 low and middle income countries developing countries/OR exp. africa/OR exp. caribbean region/OR exp. central america/OR "gulf of mexico"/OR latin america/OR mexico/OR exp. south america/OR exp. asia, central/OR asia, southeastern/OR exp. asia, western/OR china/OR mongolia/OR oceania/OR caribbean region/OR exp. indian ocean islands/OR indonesia/OR pacific islands/OR melanesia/OR micronesia/OR polynesia/OR philippines/OR west indies/OR cuba/OR dominica/OR dominican republic/OR grenada/OR haiti/OR jamaica/OR "trinidad and tobago"/OR (developing countr* OR low income countr* OR middle income countr* OR afghanistan OR albania OR algeria OR angola OR argentina OR armenia OR azerb* OR bahrain OR bangladesh OR belarus OR belize OR benin OR bhutan OR bolivia OR bosnia OR botswana OR brazil OR bulgaria OR burkina OR burma OR burundi OR cambodia OR cameroon OR africa* OR cabo verde OR cape verde OR chad OR china OR colombia OR comoros OR congo OR costa rica OR cote d'ivoire OR ivory coast OR croatia OR cuba OR djibouti OR dominica OR dominican republic OR ecuador OR egypt OR el salvador OR eritrea OR ethiopia OR fiji OR gabon OR gambia OR georgia OR ghana OR greece OR grenada OR guatemala OR guinea OR guyana OR haiti OR honduras OR india OR indonesia OR iran OR iraq OR jamaica OR jordan OR kazakhstan OR kenya OR kiribati OR korea OR kosovo OR kuwait OR kyrgyz* OR lao OR laos OR lebanon OR lesotho OR liberia OR libya OR macedonia OR madagascar OR malawi OR malaysia OR maldives OR mali OR marshall islands OR mauritius OR mexico OR micronesia OR moldova OR mongolia OR montenegro OR morocco OR mozambique OR myanmar OR namibia OR nauru OR nepal OR nicaragua OR niger OR nigeria OR oman OR pakistan OR palest* OR palau OR panama OR paraguay OR peru OR philippines OR romania OR russia* OR rwanda OR samoa OR "sao tome</p>	4383

Table 1 (continued)

S/ N	Database	Search strategy	Search results
3	Web of Science	<p>and principe" OR saudi arabia OR senegal OR serbia OR seychelles OR sierra leone OR solomon islands OR somalia OR sri lanka OR st* lucia OR sudan OR surinam* OR swaziland OR syria* OR tajikistan OR tanzania OR thailand OR timor OR togo OR tonga OR "trinidad and tobago" OR tunisia OR turkey OR turkmenistan OR tuvalu OR uganda OR ukraine OR united arab emirates OR uzbekistan OR vanuatu OR venezuela OR vietnam OR "vincent and the grenadines" OR west bank OR gaza OR yemen OR zambia OR zimbabwe).ti,ab,kf,hw.</p> <p>#1 Intimate partner violence TS = (((abus** OR "batter**" OR "beating" OR "violence" OR "rape**") NEAR/2 ("boyfriend** OR "female**" OR "girlfriend**" OR "husband** OR "marriage" OR "married" OR "marital" OR "partner" OR "spous**" OR "wife" OR "wom?n" OR "wives**")) OR "acid attack**" OR "acid throwing" OR ("batter**" OR "beating") NEAR/2 ("man" OR "men")) OR "coerced sex" OR ("couple" OR "domestic" OR "relationship**") NEAR/0 ("abuse" OR "abusive" OR "violence**")) OR "dating violence" OR "femicide" OR "femicide" OR "gender based violence" OR "gender violence" OR "intimate terrorism" OR "sexual abus**" OR "sexual assault**" OR "sexual violence" OR "unwanted sex")</p> <p>#2 interventions TS = ("evaluat**" OR "health promotion" OR "intervention**" OR "program**" OR "quasi-experiment**" OR "quasiexperiment**" OR "RCT**" OR "treatment**" OR "trial**")</p> <p>#3 low and middle income countries TS = ("developing countr**" OR "low income countr**" OR "middle income countr**" OR "afghanistan" OR "albania" OR "algeria" OR "angola" OR "argentina" OR "armenia" OR "azerb**" OR "bahrain" OR "bangladesh" OR "belarus" OR "belize" OR "benin" OR "bhutan" OR "bolivia" OR "bosnia" OR "botswana" OR "brazil" OR "bulgaria" OR "burkina" OR "burma" OR "burundi" OR "cambodia" OR "cameroon" OR "africa**" OR "cabo verde" OR "cape verde" OR "chad" OR "china" OR "colombia" OR "comoros" OR "congo" OR "costa rica" OR "cote d'ivoire" OR "ivory coast" OR "croatia" OR "cuba" OR "djibouti" OR "dominica" OR "dominican republic" OR "ecuador" OR "egypt" OR "el salvador" OR "eritrea" OR "ethiopia" OR "fiji" OR "gabon" OR "gambia" OR "georgia" OR "ghana" OR "greece" OR "grenada" OR "guatemala" OR "guinea" OR "guyana" OR "haiti" OR "honduras" OR "india" OR "indonesia" OR "iran" OR "iraq" OR "jamaica" OR "jordan" OR "kazakhstan" OR "kenya" OR "kiribati" OR "korea" OR "kosovo" OR "kuwait" OR "kyrgyz**" OR "lao" OR "laos" OR "lebanon" OR "lesotho" OR "liberia" OR "libya" OR "macedonia" OR "madagascar" OR "malawi" OR "malaysia" OR "maldives" OR "mali" OR "marshall islands" OR "mauritius" OR "mexico" OR "micronesia" OR "moldova" OR "mongolia" OR "montenegro" OR "morocco" OR "mozambique" OR "myanmar" OR "namibia" OR "nauru" OR "nepal" OR "nicaragua" OR "niger" OR "nigeria" OR "oman" OR "pakistan" OR "palest**" OR "palau" OR "panama" OR "paraguay" OR "peru" OR "philippines" OR "romania" OR "russia**" OR "rwanda" OR "samoa" OR "sao tome and principe" OR "saudi arabia" OR</p>	3710

(continued on next page)

Table 1 (continued)

S/ N	Database	Search strategy	Search results
		"senegal" OR "serbia" OR "seychelles" OR "sierra leone" OR "solomon islands" OR "somalia" OR "sri lanka" OR "st* lucia" OR "sudan" OR "surinam*" OR "swaziland" OR "syria*" OR "tajikistan" OR "tanzania" OR "thailand" OR "timor" OR "togo" OR "tonga" OR "trinidad and tobago" OR "tunisia" OR "turkey" OR "turkmenistan" OR "tuvalu" OR "uganda" OR "ukraine" OR "united arab emirates" OR "uzbekistan" OR "vanuatu" OR "venezuela" OR "vietnam" OR "vincent and the grenadines" OR "west bank" OR "gaza" OR "yemen" OR "zambia" OR "zimbabwe")	

heterogeneity in interventions and sample characteristics. Our narrower focus on couples allows for a more precise estimate of how well this population is served with interventions. Interventions targeting adolescents tend to address relationship skills more generally, rather than IPV specifically (e.g., Program H-) (Lourenço et al., 2019; Peacock & Barker 2014).

The interventions included in this study were targeted at either or both of the sexes, but all interventions were to prevent IPV perpetration against women. The interventions had to target IPV attitude/behavior either by using primary or secondary prevention with the aim of reducing the incidence of IPV. Primary prevention is defined as those interventions that are aimed at preventing initiation of IPV while secondary prevention includes those aimed at detecting and ending ongoing IPV early. Studies that utilized tertiary prevention strategies (i.e. prevent negative health or social sequelae among victims following IPV) were excluded since the aim of this study was to investigate the extent to which interventions can reduce the incidence or prevalence of IPV. Studies that applied structural interventions, addressing the wider economic, politico-legal, physical, and social environments, seeking to alter the context in which IPV occurs were also not included. This includes, for example, interventions that evaluated alcohol policy (Duailibi et al., 2007). We included interventions aimed at changing individuals including group experiences and individual agency. We included both experimental studies with a randomized comparison and quasi-experimental studies with a non-randomized comparison. Our searches were completed on September 1st, 2017 and 29th November 2021 and we searched for studies published from January 2012. This time period was chosen to cover a period of 10 years in view of previously published summaries like the systematic review by Arango et al. (2014) who summarized evidence on the effects on interventions for preventing or reducing violence against women and girls.

2.2. Literature search

We identified eligible studies following the PRISMA guidelines for meta-analysis registered the protocol on PROSPERO on February 13th, 2018 (https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42018088639). We searched for interventions evaluating intimate partner violence studies that were published in peer-reviewed literature in three databases: PsycINFO, PubMed and Web of Science. We performed three searches that combined three search themes with the Boolean operator "and" (intimate partner violence/OR) AND (evaluat* OR health promotion OR intervention* OR program* OR quasi-experiment* OR quasiexperiment* OR RCT* OR treatment* OR trial*) AND (developing countr* OR low income countr* OR middle income countr*) battered females/OR domestic violence/OR partner abuse/. Each search theme included a comprehensive list of terms intended to account for historical and disciplinary terminologies that are dissimilar or diverse (see Table 1). We selected search terms through a process consisting of a number of steps. We first identified potential

terms through expert identification, published reviews, and key terms in relevant articles. We then evaluated and selected terms based on their ability to identify relevant literature and articles not captured by other search terms. Secondary search strategies included manually searching reference lists of articles identified for data extraction and contacting an expert who recommended additional studies. Eventually, one hundred and eighty-six full-text articles were obtained after which these articles were tested against the inclusion criteria.

2.3. Study selection and data extraction

One author (OA) conducted a title screening of all articles after removing duplicates from the initial search of the online databases. Abstracts of the selected studies were retrieved and read to identify articles for full-text review using Rayyan, a free online software. OA extracted data from full-text articles using a coding form developed and piloted on three randomly selected articles. OA and OO extracted data independently using this form developed to assess the eligibility of the studies and they resolved discrepancies at each stage by consensus until 100% agreement was reached. A number of interactive meetings were conducted among the authors to make a final inclusion or exclusion decision of the full-text articles. In instances where multiple articles reported on the same study, we extracted data from the article that explicitly reported the outcome measures of interest to us. Data extraction included intervention characteristics (number of control arms, type of control, intervention delivery format, intervention content, timing, number of sessions, risk of bias, trial registration status) and study characteristics (study design, sample size, estimate of difference). We recorded data on primary outcome (IPV incidence or prevalence) and secondary outcome (attitude towards intimate partner violence).

2.4. Effect size calculation

Effect sizes were expressed in Cohen's d , which represents the standardized mean difference between the treatment and comparison groups divided by the pooled standard deviation. If a study reported dichotomous outcomes, we calculated an odds ratio and transformed it to d using DeCoster transformation (Decoster, 2009). Effect sizes were adjusted for baseline differences when pre-intervention measures were available. Multiple effect sizes were extracted from individual studies when they reported more than one outcome of interest or assessed outcomes across multiple follow-ups. The effect sizes from the last study assessment (when studies reported more than one follow-up) were used in the analyses because initial intervention effects tend to decay over time (Park et al., 2013). Using the last assessment as the point of analysis therefore provides a stronger test of the robustness of the intervention. A negative effect size for IPV behavior indicates that participants receiving the intervention showed less IPV behavior than participants in the comparison group. Similarly, a negative effect size for IPV attitude indicates that the intervention group holds less positive attitudes toward IPV than the control.

2.5. Assessment of risk of bias and the quality of evidence

Two reviewers (OA and OO) assessed the risk of bias for each study independently. We followed guidance provided in the Cochrane Handbook for Systematic Reviews of Interventions (Higgins et al., 2011) to assess the risk of bias according to the following six domains: random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, attrition bias and selective outcome reporting. We graded each risk of bias criterion as either low, high, or unclear risk of bias and summarized our judgements across different studies for each domain listed (see Table 2). Any disagreements were resolved by discussion until full consensus was reached.

Table 2
Risk of bias in the included studies.

	Sequence generation – Selection bias	Allocation sequence concealment – Selection bias	Blinding of participants and personnel – Performance bias	Blinding of outcome assessment – Detection bias	Attrition bias – Incomplete outcome data	Selective outcome reporting – Reporting bias
Abad et al. (2021)	+	+	+/-	+/-	+	+
Abeid et al. (2015)	+	+	+/-	+/-	-	-
Abramsky et al. (2014)	-	-	-	-	-	-
Alangea et al. (2020)	+	+	-	-	-	+
Alizadeh et al. (2021)	+	+	+/-	-	-	+
Babaheidarian et al. (2021)	+	+	-	+	+	+
Briaux et al. (2020)	+	+	-	-	-	+
Cao et al. (2021)	+	-	-	-	+/-	+/-
Christofides et al. (2020)	+	+/-	+/-	+/-	-	-
Clark et al. (2020)	+	+	-	+/-	-	-
Crookston et al. (2021)	-	-	+/-	+/-	-	+
Decker et al. (2020)	+	+	+	+	-	+
Doyle et al. (2018)	+	+	-	-	-	+
Dunkle et al. (2020)	+	+	-	-	-	+/-
Falb et al. (2015)	-	-	+	+/-	-	-
Fawzi et al. (2019)	+	+	-	-	-	+
Gibbs et al. (2020)	+	+	-	-	+	+/-
Glass et al. (2017)	-	-	+	+/-	-	-
Gottert et al. (2020)	+	+	+/-	+/-	+	+
Greene et al. (2021)	+	+	-	+	-	+
Gupta et al. (2017)	-	+	+	+	-	+
Halim et al. (2019)	+	+	+/-	+/-	+	+
Harvey et al. (2018)	+	+	-	-	-	+/-
Hershow et al. (2021)	+	+	-	+	+/-	+
Hossain et al. (2014)	-	+/-	+/-	+/-	-	-
Ismayilova et al. (2018)	-	-	-	-	-	-
Javalkar et al. (2019)	+	+	-	-	-	+
Kalokhe et al. (2021)	-	-	-	-	+/-	+/-
Kane et al. (2021)	+	+	-	-	-	+/-
Krishnan et al. (2016)	+	+	+/-	+/-	-	-
Maman et al. (2020)	+	+	-	-	-	+
Minnis et al. (2015)	-	+/-	+/-	+/-	-	+/-
Montgomery et al. (2021)	+	+	+/-	+/-	+	+
More et al. (2017)	+	+	+	-	-	-
Mutisya et al. (2018)	-	-	-	-	+/-	+/-
Naved et al. (2018)	+	+	+/-	+/-	+/-	+/-
Naved et al. (2021)	-	-	-	-	+	-
Patel et al. (2019)	+	+	-	+	-	+/-
Pettifor et al. (2018)	+	+	+/-	+/-	-	+
Raj et al. (2016)	-	-	+/-	+/-	-	-
Saggurti et al. (2014)	-	-	+	+/-	-	-
Satyanarayana et al. (2016)	-	-	-	-	-	-
Settergren et al. (2018)	+	+	+/-	+/-	-	+
Shahmoradi et al. (2019)	+	+	+/-	+/-	-	+/-
Sharma et al. (2020)	+	+	-	+	-	+

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Table 2 (continued)

	Sequence generation – Selection bias	Allocation sequence concealment – Selection bias	Blinding of participants and personnel – Performance bias	Blinding of outcome assessment – Detection bias	Attrition bias – Incomplete outcome data	Selective outcome reporting – Reporting bias
Vaillant et al. (2020)	+	+	+/-	+/-	-	+
Wagman et al. (2015)	-	+/-	+	+	-	-
Wechsberg et al. (2013)	-	-	-	-	-	-

Note. (+/-): unclear risk of bias; (-): high risk of bias; (+): low risk of bias.

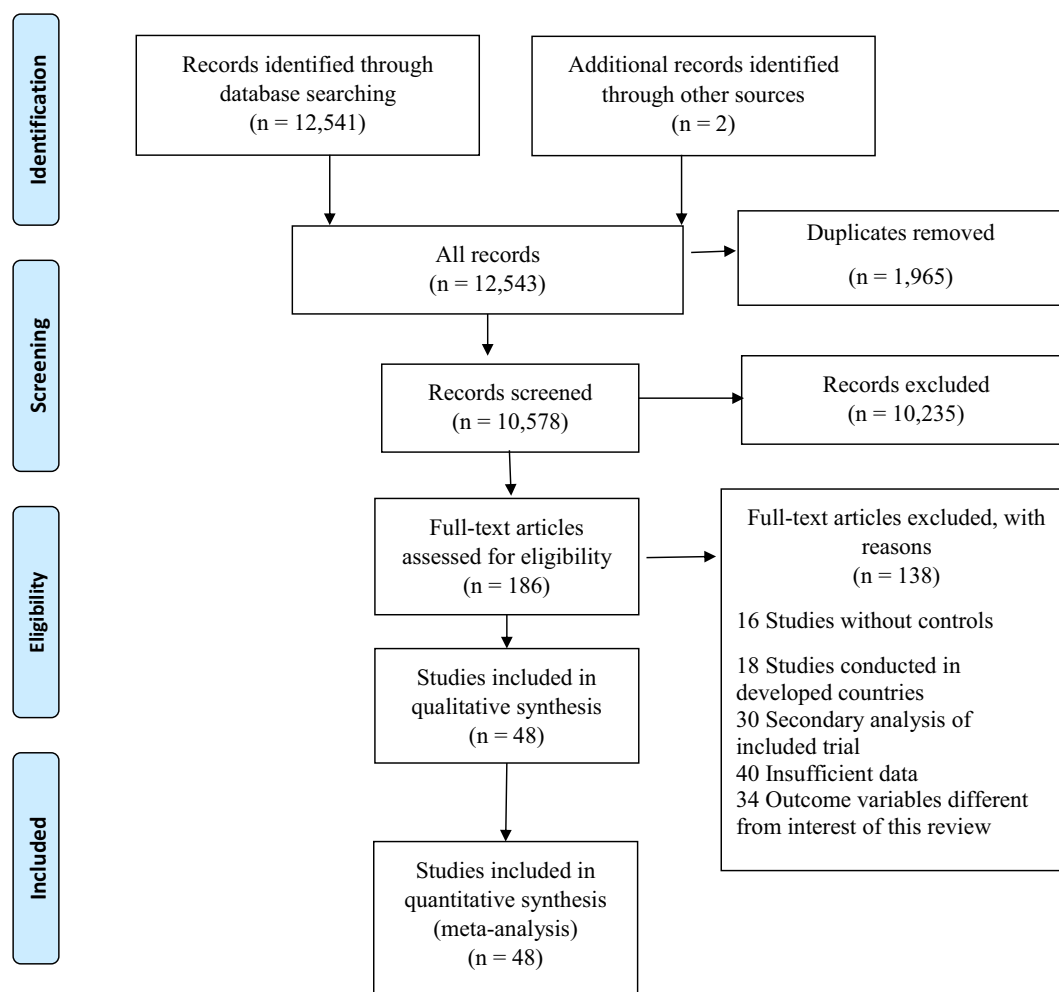


Fig. 1. PRISMA flow diagram.

2.6. Analysis

Effect sizes were analyzed in a three-level meta-analytic model in which three sources of variance were modeled (1) sampling variance at the first level of the model; (2) within-study variance at the second level of the model; and (3) between-study variance at the third level of the model. By applying this three-level technique to meta-analysis, effect size dependency was accounted for. Consequently, all relevant effect sizes were extracted from each included study, and this implied that the statistical power in the analyses was maximized. In addition, coefficients were estimated more reliably than when only one effect size per study was extracted. To determine whether heterogeneity was present in effect sizes, a two one-sided log-likelihood ratio test was performed to separately test the significance of the variance distributed at levels 2 and 3 of the model. In case of a significant result of any of these tests, and a

significance test indicated that heterogeneity was present and that moderator analyses could be performed. Moderator analyses were performed by adding a covariate (i.e., one of the coded variables) to the meta-analytic model. All analyses were performed in R.

3. Results

3.1. Characteristics of included studies

The search strategy produced 10,578 articles from different databases and other sources after removing duplicates, as presented in the PRISMA flow diagram in Fig. 1. Out of these, 10,392 articles were excluded by reading the title and abstract, and 186 articles were eligible for full text screening. Of these, 138 did not meet the full inclusion criteria and 48 studies were eligible for inclusion. Reasons for exclusion

Table 3
Overview of included studies.

Citation	Country/Region	Study design	Participants	Intervention and control group	Outcome measures	Results
Abad et al. (2021)	Iran/Central Asia	RCT	60 women aged 18–49 years (30 Intervention, 30 Control)	<u>Intervention:</u> Four problem-solving skills training sessions <u>Control:</u> Care as usual	IPV behavior	Abuse scores were significantly lower in the intervention group
Abeid et al. (2015)	Tanzania/East Africa	Quasi-experimental	1568 men and women aged 18–49 years (807 Intervention, 744 Control)	<u>Intervention:</u> One 1-hour radio programs weekly for 8 months, 10,000 fliers were disseminated and 4 advocacy meetings with local leaders including religious leaders over 8 months. <u>Control:</u> No treatment	Attitude towards IPV	No significant effect on the attitudes towards IPV
Abramsky et al. (2014)	Uganda/East Africa	Cluster RCT	2532 men and women aged 18–49 years (1368 Intervention, 1164 Control)	<u>Intervention:</u> Training activities, community activism, and community media. <u>Control:</u> Minimal intervention	Attitude towards IPV behavior	Significantly lower attitude towards IPV among women
Alangea et al. (2020)	Ghana/West Africa	Community RCT	Men and women, aged 18–49 years (1030 Intervention, 1168 Control)	<u>Intervention:</u> Trained Community Based Action Teams undertook community sensitization and awareness raising for 18 months <u>Control:</u> No treatment	IPV behavior	52% lower past year experience of physical IPV among women In intervention communities, women's past year experience of sexual IPV reduced significantly, compared with those in the control communities. The prevalence of past-year physical IPV among women in the intervention communities reduced. The prevalence of severe IPV experienced by women reduced in intervention versus in controls
Alizadeh et al. (2021)	Iran/Central Asia	RCT	154 pregnant women (103 Intervention, 51 Control)	<u>Intervention:</u> Two groups received the intervention: Group A had three 90-min sessions of group training, Group B had three self-group training. <u>Control:</u> Care as usual	IPV behavior	There was no statistically significant difference in the mean total scores of sexual violence among the pregnant women in the different groups in the third trimester of pregnancy and at the end of the third trimester. Although sexual violence was not statistically significant, the number of sexually-violated women in the training group decreased during the training period compared to the self-training and control groups
Babaheidarian et al. (2021)	Iran/Central Asia	RCT	90 pregnant women (45 Intervention, 45 Control)	<u>Intervention:</u> Three 45-minute individual counseling sessions were held for the pregnant women and their spouses according to GATHER principles. <u>Control:</u> Care as usual	IPV behavior	Intervention reduced the mean score of IPV significantly. Also, various domains of violence including mental, verbal, financial, physical, sexual, and social violence were significantly declined in the intervention group, except emotional violence.
Briaux et al. (2020)	Togo/West Africa	Cluster RCT	Women who were at least 3 months pregnant and mothers of children aged 0–23 months (1035 Intervention, 996 Control)	<u>Intervention:</u> Monthly cash distributions to women combined with behavior change communication (BCC) activities (including home visits and community sensitization meetings) <u>Control:</u> Minimal intervention	IPV behavior	Women from the intervention arm had lower odds of being physically assaulted by their partner than women in the control arm. The intervention however, had no overall impact on psychological/emotional violence
Cao et al. (2021)	Ghana/West Africa	Cluster RCT	354 Pregnant women of at least 16 years of age (221 Intervention, 153 Control)	<u>Intervention:</u> women in the intervention group had 14 1-hour group sessions every 2 weeks for 7 months <u>Control:</u> Care as usual	IPV behavior	The intervention did not reduce IPV in the intervention group compared to the control group
Christofides et al. (2020)	South Africa/Southern Africa	Cluster RCT	4508 men aged 18–40 years (767 Intervention, 741 Control)	<u>Intervention:</u> Door-to-door conversations and mini-workshops conducted by trained Community Action Teams over a period of 18 months <u>Control:</u> No treatment	IPV behavior	The intervention did not significantly affect any of the primary or secondary outcomes. There was no effect on men's past year use of physical or sexual IPV or a reduction in severe IPV.
Clark et al. (2020)	Nepal/South East Asia	2-Armed, single-blinded cluster trial,	2185 married male and female (719 Intervention, 717 Control)	<u>Intervention:</u> The behavior change communication component is a 9-month, weekly radio drama plus real-life interviews, which includes a listener engagement component. Married male and female were		Results show that the adjusted difference in physical and/or sexual IPV declines more in the comparison condition as compared to the experimental condition

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Table 3 (continued)

Citation	Country/Region	Study design	Participants	Intervention and control group	Outcome measures	Results
Crookston et al. (2021)	Burkina Faso/ West Africa	Quasi-experimental	751 female members of a savings group and their husbands (382 Intervention, 378 Control)	further engaged in radio Listening and Discussion Groups. <u>Control:</u> Minimal intervention <u>Intervention:</u> Intervention group received a comprehensive package consisting of agriculture loans and services, microenterprise loans, and education, nutrition education, and women's empowerment programs including gender-based discussions	Attitude towards IPV	Men were more likely to have adequate empowerment in attitudes about domestic violence than women. Participants from the treatment group
Decker et al. (2020)	Kenya/East Africa	RCT	312 women with prior experience of IPV, aged 18–35 years (157 intervention, 115 control)	<u>Intervention:</u> Use of myPlan Kenya software application <u>Control:</u> Care as usual	IPV behavior	There were no significant between-group differences in IPV
Doyle et al. (2018)	Rwanda/East Africa	RCT	Couples (575 intervention couples, 624 control couples)	<u>Intervention:</u> The Bandedereho couples' intervention engaged men and their partners in participatory, small group sessions of critical reflection and dialogue with a 15-session curriculum <u>Control:</u> No intervention	IPV behavior	Compared to the control group, women in the intervention group reported: significantly less past-year physical and sexual IPV
Dunkle et al., 2020	Rwanda/East Africa	RCT	3153 men and women (1578 intervention, 1575 control)	<u>Intervention:</u> A 21-session couples' curriculum; community outreach by trained community activists; the creation of an enabling environment through training and active involvement of key opinion leaders; and provision of support to victims through the creation of women's 'safe spaces' <u>Control:</u> No intervention	IPV behavior Attitude towards IPV	Women in the intervention compared with control were less likely to report physical and/or sexual IPV at 24 months. Men in the intervention compared with control were also significantly less likely to report perpetration of physical and/or sexual IPV at 24 months. There was also reductions in acceptability of wife beating, No statistically or marginally significant decreases in physical and/or sexual violence, physical violence, or sexual violence IPV reduced by 40% among women
Falb et al. (2015)	Cote d'Ivoire/ West Africa	Quasi-experimental	682 women aged 18 and above (371 Intervention, 311 Control)	<u>Intervention:</u> Village Savings and Loans Associations and 8 Gender dialogue group sessions <u>Control:</u> Minimal intervention	IPV behavior	Participants went through 10 group sessions of the NAMWEZA intervention <u>Control:</u> Waiting list
Fawzi et al. (2019)	Tanzania/East Africa	Stepped-wedge RCT	458 people living with HIV, aged 18 and above (91 Intervention, 367 Control)	<u>Intervention:</u> Participants went through 90 to 180 min economic and social empowerment group training, savings, legal and financial service for 12 months <u>Control:</u> Minimal intervention	IPV behavior	The intervention did not show significant impact on IPV. The intervention did improve gender-equitable relationships
Gibbs et al. (2020)	Afghanistan/ Central Asia	RCT	933 married women, aged 18–49 (479 Intervention, 452 Control)	<u>Intervention:</u> Two 1-h group sessions delivered to women by a peer educator <u>Control:</u> Minimal intervention	IPV behavior Attitude towards IPV	The intervention did not show significant impact on IPV. The intervention did improve gender-equitable relationships
Glass et al. (2017)	DR Congo/ Central Africa	RCT	833 men and women aged 25 and above (309 Intervention, 524 Control)	<u>Intervention:</u> Community mobilization for 3 years <u>Control:</u> Minimal intervention	IPV behavior	The groups did not differ significantly on physical or sexual violence at 18 months, even though there was a decrease in the experience and perpetration of IPV
Gottert et al. (2020)	South Africa/ Southern Africa	Community RCT	Men and women ages 18–49 (278 Intervention, 258 Control)	<u>Intervention:</u> Community mobilization for 3 years <u>Control:</u> Minimal intervention	IPV behavior	Among younger men, reported IPV perpetration decreased between baseline and end line). For older women, reported experience of IPV significantly increased over time, irrespective of the intervention
Greene et al. (2021)	Tanzania/East Africa	Cluster RCT	311 women in refugee, 18 years and older	<u>Intervention:</u> One individual session provided by a facilitator followed by seven weekly group sessions delivered in person by a pair of facilitators <u>Control:</u> Minimal intervention	IPV behavior	IPV severity reduced moderately. There was also a small change in IPV frequency
Gupta et al. (2017)	Mexico/Latin America	Cluster RCT	950 women aged 18–44 (480 Intervention, 470 Control)	<u>Intervention:</u> Integrated IPV and health screening assessment; supportive care; safety planning and harm reduction counseling; assisted referrals; and a booster counseling session at 3 months, all delivered by trained nurses <u>Control:</u> No treatment	IPV behavior	Reductions in IPV were observed for both women enrolled in treatment and control. No significant treatment effects were observed

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Table 3 (continued)

Citation	Country/Region	Study design	Participants	Intervention and control group	Outcome measures	Results
Halim et al. (2019)	Tanzania/East Africa	Cluster RCT	450 couples (254 Intervention, 123 Control)	<u>Intervention:</u> In Intervention Group 1, women participated in savings groups and men participated in peer-groups addressing gender relations and IPV prevention. In Intervention Group 2, women participated in savings groups, men participated in peer-groups, and community leaders facilitated dialogues on similar topics <u>Control:</u> Minimal intervention	Attitude towards IPV behavior	More men in Interventions groups 1 and 2 disagreed with wife-beating compared to men in the Control; and more men reported non-perpetration of IPV in Interventions 1 and 2 compared to the Control.
Harvey et al. (2018)	Tanzania/East Africa	Cluster RCT	1265 women (551 Intervention, 575 Control)	<u>Intervention:</u> A group received two sessions of brief intervention and the second group had six session of combine intervention <u>Control:</u> care as usual	IPV behavior Attitude towards	The intervention showed no evidence of an impact on either reported past year physical or sexual IPV among women. There was, however, evidence of a reduction in past-year emotional abuse, and intervention women were much less likely to express attitudes accepting of IPV.
Hershow et al. (2021)	Vietnam/Central Asia	RCT	426 Male participants, aged 18 years and older	<u>Intervention:</u> A group received two sessions of brief intervention and the second group had six session of combine intervention <u>Control:</u> care as usual	IPV behavior	The participants in the two intervention groups reported reduced IPV perpetration at 3 months compared with control participants. The association was only significant for only one of the groups.
Hossain et al. (2014)	Cote d'Ivoire/West Africa	Cluster RCT	560 men aged 15 and above (274 Intervention, 286 Control)	<u>Intervention:</u> Weekly men's discussion group over 4 months <u>Control:</u> Minimal intervention	Attitude towards IPV behavior	Improved attitudes towards sexual IPV but not significant Physical and/or sexual IPV in the intervention arm had decreased compared to the control arm
Ismayilova et al. (2018)	Burkina Faso/West Africa	Cluster RCT	360 women (240 Intervention, 120 Control)	<u>Intervention:</u> Village Savings and Loans Associations and 35- to 45-minute-monthly-family coaching sessions for 5 months. <u>Control:</u> No treatment	IPV behavior	Reduction in emotional spousal violence in the past year, with the effect size greater for the combined intervention group
Javalkar et al. (2019)	India/South East Asia	Cluster RCT	547 female sex workers, 18 years and older with intimate partners (259 Intervention, 288 Control)	<u>Intervention:</u> 12 reflection sessions, counseling, training of male Champions, building alliances with other networks and peer education <u>Control:</u> Wait list	IPV behavior	Experience of sexual/physical IPV increased from 25.9% at baseline to 63.3% at midline and then dropped to 9.0% at end line. Likewise, severe physical and/or sexual violence increased from 19.2% to 54.5% and then dropped to 8.7%.
Kalokhe et al. (2021)	India/South East Asia	Quasi-experimental	40 couples (20 Intervention, 20 Control)	<u>Intervention:</u> 20 couples received the 6-session Ghya Bharari Ekatra group intervention over a 6-week period which included information on IPV support services <u>Control:</u> Care as usual	IPV behavior	The intervention was associated with less reporting of psychological IPV among female participants
Kane et al. (2021)	Zambia/Southern Africa	RCT	248 couples, 18 and 35 years of age (123 Intervention, 125 Control)	<u>Intervention:</u> Groups were designed to run for 90–120 min, with each session beginning with a tea time where participants could socialize to promote group cohesion and motivate regular and punctual attendance <u>Control:</u> Minimal intervention	IPV behavior	Mean reduction in IPV at 12 months post-baseline was statistically significantly greater among women who received the intervention compared to women in the control.
Krishnan et al. (2016)	India/South East Asia	Quasi-experimental	18–25 453 women (234 Intervention, 219 Control)	<u>Intervention:</u> Conditional cash transfer and group counseling sessions for males and females. <u>Control:</u> Wait list	Attitude towards IPV	Statistically significant improvements in attitudes related to unacceptability of IPV
Maman et al. (2020)	Tanzania/East Africa	Cluster RCT	1258 men (621 Intervention (628 Control)	<u>Intervention:</u> A microfinance and peer health leadership intervention <u>Control:</u> Wait list	IPV behavior Attitude towards	There were no differences by condition in IPV perpetration at the 30-month follow-up. Intervention participants reported significantly lower levels of inequitable gender norm attitudes
Minnis et al. (2015)	South Africa/Southern Africa	Cluster RCT	101 couples aged 18–39 (57 Intervention, 44 Control)	<u>Intervention:</u> Two, 3-h sessions delivered to couples 1 week apart by peer leaders within the community. <u>Control:</u> Minimal intervention	IPV behavior	Women in the intervention arm had a higher odd of reporting no victimization

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Table 3 (continued)

Citation	Country/Region	Study design	Participants	Intervention and control group	Outcome measures	Results
Montgomery et al. (2021)	South Africa/ Southern Africa	RCT	405 women (309 Intervention, 96 Control)	<u>Intervention:</u> Empowerment counseling was implemented at enrollment, a shorter booster session at the month 1 visit, and ongoing follow-up with counseling as needed through month 3 and 6 <u>Control:</u> Minimal intervention	IPV behavior	There were no significant differences in the risk of IPV during follow-up at Site A or Site B versus Control site. The risk of IPV during follow-up was marginally significantly lower at Site B
More et al. (2017)	India/South East Asia	Cluster RCT	8271 women aged 15–49 years	<u>Intervention:</u> Included home visits, organized group meetings, day care for malnourished children, and community events, provided services, and engagement with existing systems. <u>Control:</u> No treatment	IPV behavior	There was a reduction in the IPV experienced between the intervention and the control but was not significant
Mutisya et al. (2018)	Kenya/East Africa	Quasi-experimental	283 pregnant women, aged 18–45 (141 Intervention, 142 Control)	<u>Intervention:</u> Three 30–35 min psychosocial support sessions with each participant <u>Control:</u> Care as usual	IPV behavior	Intervention resulted in a significant reduction in the total IPV and physical violence scores between the intervention and the control group, with small effect size
Naved et al. (2018)	Bangladesh/ South East Asia	Cluster RCT	Females aged 15–29 and males aged 18–35 years (600 Intervention, 2670 Control)	<u>Intervention:</u> Thirteen, 2-hour sessions delivered separately to female and male over 20 months, Community mobilization campaigns and health and legal provisions <u>Control:</u> Care as usual	IPV behavior	Intervention lowered the risk of experiencing all forms of IPV among young women but the results were not statistically significant
Naved et al. (2021)	Bangladesh/ South East Asia	Quasi-experimental	607 women workers (297 Intervention, 295 Control)	<u>Intervention:</u> Six 3-hour parallel group sessions for female and male workers and the management staff <u>Control:</u> No treatment	IPV behavior	There was decline in violence reported in both arms by end line, and the rate of decline in the control arm exceeded that in the intervention arm
Patel et al. (2019)	India/South East Asia	RCT	379 married women (112 Intervention, 120 Control)	<u>Intervention:</u> Six to eight 30–45 min sessions, which included psychoeducation on activity and mood, behavior monitoring, activity scheduling, social network activation, and problem solving <u>Control:</u> Care as usual	IPV behavior	Intervention showed reduction in intimate partner physical violence among women
Pettifor et al. (2018)	South Africa/ Southern Africa	Cluster RCT	2356 men and women aged 18–35 (1179 Intervention, 1177 Control)	<u>Intervention:</u> comprised workshops, community activities and leadership engagement open to men and women <u>Control:</u> No treatment	IPV behavior	The intervention did not result in significant differences in perpetration of intimate partner violence among men and women in intervention communities, compared to control communities. Men in the intervention were less likely than those in the control clusters to report attitudes accepting of sexual IPV at 9-month and 18-month follow-up, and attitudes accepting of physical IPV at 18-month follow-up. Women in the intervention arm were less likely to report sexual IPV at 18-month follow-up
Raj et al. (2016)	India/South East Asia	Cluster RCT	1081 men and women aged 15–49 (469 Intervention, 612 Control)	<u>Intervention:</u> 3 counseling sessions delivered to married men and couples by trained male village health <u>Control:</u> Care as usual	Attitude towards IPV behavior	Men in the intervention were less likely than those in the control clusters to report attitudes accepting of sexual IPV at 9-month and 18-month follow-up, and attitudes accepting of physical IPV at 18-month follow-up. Women in the intervention arm were less likely to report sexual IPV at 18-month follow-up
Saggurti et al. (2014)	India/South East Asia	Cluster RCT	220 women aged 18–40 (118 Intervention, 102 Control)	<u>Intervention:</u> 4 individual sessions and 2 group sessions delivered to women over 6–9 weeks. <u>Control:</u> Minimal intervention	IPV behavior	Intervention participants reported significant marital IPV and marital sexual coercion, control participants reported significant reductions in and IPV
Satyanarayana et al. (2016)	India/South East Asia	RCT	177 men, aged 21 and above (88 Intervention, 89 Control)	<u>Intervention:</u> Eight 45–60 min cognitive-behavioral sessions, delivered face-to-face <u>Control:</u> Care as usual	IPV behavior	Men in the intervention significantly lower IPV perpetration
Settergren et al. (2018)	Tanzania/East Africa	Cluster RCT	1143 women, aged 15–49 (556 Intervention, 587 Control)	<u>Intervention:</u> The multicomponent program included community sensitization, group education, training and building linkages with services <u>Control:</u> Care as usual	IPV behavior	The mean scores of IPV in the intervention group showed significant reduction compared to the control group
Shahmoradi et al. (2019)	Iran/Central Asia	Quasi-experimental	32 women referred to counseling centers (16 Intervention, 16 Control)	<u>Intervention:</u> Eight sessions of Emotion-focused Therapy <u>Control:</u> Care as usual	IPV behavior	IPV decreased significantly after the intervention.
		Cluster RCT				

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Table 3 (continued)

Citation	Country/Region	Study design	Participants	Intervention and control group	Outcome measures	Results
Sharma et al. (2020)	Ethiopia/North Africa		6770 households in which the woman was between 18 and 49 years (5090 Intervention, 1680 Control)	<u>Intervention:</u> 14 participatory and skill-building sessions led by 1 trained, same-sex facilitator for men's and women's groups and 1 female and 1 male facilitator for couples' groups <u>Control:</u> Minimal intervention	IPV behavior	There was no effect of the intervention compared to control on women's past-year experience of physical or sexual IPV. Although, the intervention significantly reduced male perpetration of past-year sexual IPV but not perpetration of past-year physical IPV.
Vaillant et al. (2020)	Democratic Republic of Congo/Central Africa	Cluster RCT	Adult men and their female partners, aged 18 and older (1190 Intervention, 1188, Control)	<u>Intervention:</u> 3-h group discussion for men over 16 weeks <u>Control:</u> Care as usual	IPV behavior	No statistically significant differences in women's experiences of IPV between treatment and control groups at follow-up
Wagman et al. (2015)	Uganda/East Africa	Cluster RCT	4746 men and women, aged 15–49 (2962 Intervention, 3564 Control)	<u>Intervention:</u> 3 workshops, Community action groups (CAGs) a 10-lesson with boys and men, a 1-day seminar and advocacy events <u>Control:</u> Care as usual	IPV behavior	Compared with control groups, individuals in the intervention groups had fewer self-reports of past-year physical. Incidence of emotional IPV did not differ. The intervention had no effect on male-reported IPV perpetration
Wechsberg et al. (2013)	South Africa/Southern Africa	RCT	360/179 720 women, aged 18–33 (360 Intervention, 181 Control 1, 179 Control 2)	<u>Intervention:</u> Two, 1-hour sessions delivered to women by peer leaders. <u>Control:</u> Care as usual	IPV behavior	There were no differences by intervention arm or time for IPV behavior

Note. RCT = Randomized Controlled Trial; IPV = Intimate Partner Violence.

are reported in Fig. 1. An overview of the included studies and a description of the instruments used to measure IPV are presented in Tables 3 and 4, respectively.

Thirteen of the included studies were conducted in Eastern Africa, another ten were conducted in South East Asia, six in central Asia, seven in Western Africa, seven in southern Africa, three in Central Africa, one each in Latin America and in North Africa (Table 3). Across all included studies there were a total of 64,344 participants, and the sample size ranged from 32 to 8271 participants.

Three study designs were employed across the included studies: twenty-four studies were cluster randomized controlled trials, sixteen were randomized controlled trials and eight were quasi-experimental studies. The studies reported participants' ages from 15 years to 60 years.

For the outcomes, thirty-seven studies reported IPV behavior alone, four studies reported attitudes toward IPV alone, while seven studies reported both attitudes toward IPV together with IPV behavior. Twenty-one of the 48 studies included in this review assessed outcomes employing scales ("modules") from the WHO multi-country study on women's health and domestic violence alone and three others combined the WHO scale with the DHS or the GEMS scales. Seven studies used modules from the Demographic and Health Surveys (DHS), four studies employed modules from the Conflict Tactics Scale, ten others used a variety of scales while three studies did not report what scales were used (Tables 4).

As the scales for measuring outcomes varied, so were the interventions examined in the studies. The interventions employed different approaches based on the risk factors targeted, delivery methods, frequency and duration of sessions. The intervention approaches employed in the studies included in this review fall within five of the seven domains of the WHO RESPECT Framework (WHO, 2019). Three studies fell in 'R- relationship skills strengthening' as they sought to strengthening relationship between couples; seventeen studies were in 'E- Empowerment of women' category as they empowered women through life skills, saving and loans schemes; eleven studies were in 'S-Service ensured' category, providing counseling and psychological support to participants; two studies were in 'P- Poverty reduction' category, providing vouchers, cash transfers and other forms of assets to women and fifteen studies were in 'T- transformed attitudes and norms'

category, through community mobilization, group workshops and media campaigns (Table 5). Overall, the studies that employed interventions to empower women and transformed attitudes and norms, tend to be more gender-transformative in their approach.

3.2. Intervention effects on attitudes toward IPV

The overall effect of the interventions on attitudes toward IPV based on 14 effect sizes extracted from 10 studies, was $d = -0.302$ (95% CI = -0.635 to 0.032 and $p = 0.072$) (see Table 6), meaning there was no significant difference in attitudes toward IPV between participants who had been offered an intervention and participants in the control group. According to the criteria formulated by Cohen (Decoster, 2009; Lakens, 2013), the overall effect of -0.302 can be regarded as small. Around 46% of the variance in effect size could be attributed to within-study differences in effect sizes (level 2), reflecting that individual studies report effect sizes that differ in magnitude, and around 49% could be attributed to between-study differences in effect sizes (level 3), reflecting that also across studies effect sizes seem to differ in magnitude.

The results of the two log-likelihood ratio tests revealed significant within-study variance ($\chi^2(2) = 111.023$, $p < 0.001$; one-sided), and significant between-study variance ($\chi^2(2) = 3.439$, $p = 0.032$; one-sided). These results imply that heterogeneity in effect size was found within and between studies suggesting that characteristics of effect sizes within studies (e.g., measurements used) as characteristics of studies themselves (e.g., sample, intervention, and measurements used) contribute to the variation in effect sizes observed.

3.3. Intervention effects on IPV behavior

The overall effect of the interventions on IPV behavior based on 117 effect sizes extracted from 45 studies, was $d = -0.077$ (95% CI = -0.163 to 0.009 and $p = 0.081$) (see Table 6), meaning there was no significant difference in IPV behavior between participants who had been offered an intervention and the participants in the control condition. According to the criteria formulated by Cohen, the overall effect of -0.077 can be regarded as small. Around 19% of the variance could be attributed to within-study differences in effect sizes (level 2) and around 77% could be attributed to between-study differences in effect sizes (level 3). Once

Table 4
IPV outcomes and modules used in included studies.

Citation	Outcome measure	IPV module used	Number of items included in module
Abad et al. (2021)	Physical IPV	Index of Spouse Abuse	11 items
Abeid et al. (2015)	Attitude towards IPV	Not reported	Not reported
Abramsky et al. (2014)	Physical IPV Sexual IPV Attitude towards IPV	WHO and DHS	7 items 2 items 12 items
Alangea et al. (2020)	Physical IPV Sexual IPV	WHO	5 items 3 items
Alizadeh et al. (2021)	Sexual IPV	The sexual violence questionnaire	5 items
Babaheidarian et al. (2021)	Physical IPV Emotional IPV Sexual IPV Economic violence	Mohseni Tabriz domestic violence questionnaire	6 items 4 items 4 items 5 items
Briaux et al. (2020)	Physical IPV Emotional IPV Controlling behavior	WHO	5 items 4 items 3 items
Cao et al. (2021)	Physical IPV Emotional IPV Sexual IPV Controlling behavior	Ghana DHS	8 items 2 items 4 items 6 items
Christofides et al. (2020)	Physical IPV Sexual IPV	Men's Health and Relationships	6 items 2 items
Clark et al. (2020)	Physical IPV Emotional IPV Sexual IPV Economic violence	WHO	5 items 4 items 3 items 3 items
Crookston et al. (2021)	Attitude towards IPV	Pro-WEAI instrument	5 items
Decker et al. (2020)	Physical IPV Emotional IPV Sexual IPV	Revised Conflicts and Tactics Scale	10 items 10 items 9 items
Doyle et al. (2018)	Physical IPV Sexual IPV	WHO	5 items 2 items
Dunkle et al. (2020)	Physical IPV Emotional IPV Sexual IPV Economic Abuse	WHO	5 items 4 items 3 items 3 items
Falb et al. (2015)	Physical IPV Emotional IPV Sexual IPV Economic Abuse	WHO	4 items 2 items 4 items 3 items
Fawzi et al. (2019)	Physical IPV Emotional IPV Sexual IPV	DHS	10 items 7 items 2 items
Gibbs et al. (2020)	Physical IPV Emotional IPV	WHO	5 items 7 items
Glass et al. (2017)	Physical IPV Emotional IPV Sexual IPV	WHO	7 items 3 items 2 items
Gottert et al. (2020)	Physical IPV Sexual IPV Attitude towards IPV	WHO GEMS	7 items 3 items 7 items
Greene et al. (2021)	Physical IPV Emotional IPV Sexual IPV	DHS	7 items 2 items 2 items
Gupta et al. (2017)	Physical IPV Sexual IPV	WHO	5 items 2 items
Halim et al. (2019)	Physical IPV Emotional IPV Sexual IPV Economic violence	Tanzania DHS	5 items 6 items 2 items 4 items
Harvey et al. (2018)	Physical IPV Emotional IPV	WHO	6 items 4 items

Table 4 (continued)

Citation	Outcome measure	IPV module used	Number of items included in module
	Sexual IPV Attitude towards IPV		3 items 6 items
Hershov et al. (2021)	Physical IPV Emotional IPV Sexual IPV	Shortened Conflict Tactics Scales	2 items 2 items 2 items
Hossain et al. (2014)	Attitude towards sexual violence Physical IPV Sexual IPV	WHO	7 items 3 items 7 items
Ismayilova et al. (2018)	Physical IPV Emotional IPV	DHS	7 items 3 items
Javalkar et al. (2019)	Physical IPV Sexual IPV Attitude towards IPV	WHO	7 items 3 items 7 items
Kalokhe et al. (2021)	Emotional IPV	Indian Family Violence and Control Scale	22 items
Kane et al. (2021)	Physical IPV Sexual IPV	WHO	7 items 3 items
Krishnan et al. (2016)	Attitude towards IPV	RESPECT	4 items
Maman et al. (2020)	Physical IPV Sexual IPV	WHO	7 items 3 items
Minnis et al. (2015)	Physical IPV Emotional IPV	WHO	7 items 3 items
Montgomery et al. (2021)	Physical IPV Sexual IPV	WHO	7 items 3 items
More et al. (2017)	Physical IPV Emotional IPV Sexual IPV	Not reported	
Mutisya et al. (2018)	Physical IPV Emotional IPV	Abuse Assessment Screen	5 items 5 items
Naved et al. (2018)	Physical IPV Sexual IPV Economic abuse	Conflict Tactics Scales	5 items 3 items 4 items
Naved et al. (2021)	Physical IPV Sexual IPV Attitude towards IPV	WHO	5 items 5 items 6 items
Patel et al. (2019)	Physical IPV	Client Service Receipt Inventory	2 items
Pettifor et al. (2018)	Physical IPV Emotional IPV Sexual IPV Economic abuse Attitude towards IPV	WHO GEMS	7 items 3 items 2 items 24 items
Raj et al. (2016)	Physical IPV Sexual IPV	DHS	6 items 2 items
Saggurthi et al. (2015)	Physical IPV Sexual IPV	Not reported	1 item 1 item
Satyanarayana et al. (2016)	Physical IPV	Index of Spouse Abuse	15 items
Settergren et al. (2018)	Physical IPV Emotional IPV Sexual IPV	DHS	6 items 3 items 2 items
Shahmoradi et al. (2019)	Physical IPV Emotional IPV Sexual IPV Economic abuse	Aghakhani et al	63 items
Sharma et al. (2020)	Physical IPV Sexual IPV Attitude towards IPV	WHO	7 items 3 items 6 items
Vaillant et al. (2020)	Physical IPV Emotional IPV Sexual IPV Attitude towards IPV	WHO	7 items 7 items 2 items 6 items
Wagman et al. (2015)	Physical IPV Emotional IPV Sexual IPV	Conflict Tactics Scales	10 items Not reported 3 items

(continued on next page)

Table 4 (continued)

Citation	Outcome measure	IPV module used	Number of items included in module
Wechsberg et al. (2013)	Physical IPV	WHO	7 items

Note. WHO = World Health Organization; DHS = Demographic and Health Survey; GEMS = Gender Equitable Men Scale; Pro-WEAI = Women's Empowerment in Agriculture Index.

Table 5

List of interventions as they align with the WHO RESPECT Framework.

Domains of the RESPECT Framework	Number of studies	List of studies
R-relationship skills strengthening	3	Alizadeh et al. (2021), Fawzi et al. (2019), More et al. (2017)
E-Empowerment of women	17	Abad et al. (2021), Crookston et al. (2021), Decker et al. (2020), Gibbs et al. (2020), Halim et al. (2019), Maman et al. (2020), Naved et al. (2018), Shahmoradi et al. (2019), Dunkle et al. (2020), Kane et al. (2021), Wechsberg et al. (2013), Falb et al. (2015), Saggurti et al. (2014), Satyanarayana et al. (2016), Glass et al. (2017), Minnis et al. (2015), Ismayilova et al. (2018)
S- Service ensured	11	Babaheidarian et al. (2021), Cao et al. (2021), Greene et al. (2021), Hershow et al. (2021), Kalokhe et al. (2021), Montgomery et al. (2021), Mutisya et al. (2018), Settergren et al. (2018), Patel et al. (2019), Gupta et al. (2017), Wagman et al. (2015)
P- Poverty reduction	2	Briaux et al. (2020) & Krishnan et al. (2016)
E-Environments, including schools, public spaces and work, made safe	-	-
C-Child and adolescent abuse prevented, while nurturing family relationships	-	-
T-transformed attitudes and norms	15	Abramsky et al. (2014), Alangea et al. (2020), Christofides et al. (2020), Clark et al. (2020), Doyle et al. (2018), Gottert et al. (2020), Javalkar et al. (2019), Naved et al. (2021), Pettifor et al. (2018), Settergren et al. (2018), Vaillant et al. (2020), Sharma et al. (2020), Harvey et al., 2018Raj et al. (2016) & Hossain et al. (2014)

again, the within-study variance at the second level of the model was significant ($\chi^2(2) = 186.44, p < 0.001$; one-sided), as well as the between-study variance at the third level of the model ($\chi^2(2) = 35.441, p = 0.001$; one-sided).

Table 6

Summary of effect size analysis.

	d	SE	95% CI	p-value	% Var. at Level 1	% Var. at Level 2	% Var. at Level 3	Level 2 Variance sig.	Level 3 Variance sig.
Intervention effects on attitudes towards IPV	-0.302	0.154	-0.635; 0.032	0.072	4.39	46.19	49.43	0.172***	0.104***
Intervention effects on IPV behavior	-0.077	0.043	-0.163; -0.009	0.081	3.63	19.11	77.26	0.017***	0.068***

Note. d = Cohen's d; SE = Standard error; CI = Confidence interval; % Var = Percentage of variance explained; Level 2 variance = within-study variance; Level 3 variance = between study variance.

*** p < 0.001.

4. Discussion

This meta-analysis brings together evidence from experimental and quasi-experimental designs on the effectiveness of interventions to reduce IPV in LMICs. We tested how effective these interventions are in changing attitudes toward IPV and in changing IPV behavior. We identified 48 evaluations from nineteen LMICs on 3 continents. Interventions varied regarding the risk factors they targeted, their delivery methods, goals, session frequency, and duration. The intervention approaches employed in this review addressed IPV using five of the seven domains of the RESPECT Framework, unlike the What Works to Prevent Violence against Women and Girls series which included interventions across all seven domains of the RESPECT Framework (Kerr-Wilson et al., 2020). This might be because the scope of this review is narrower, reviewing interventions targeting married men and women.

4.1. Main findings

We found no evidence for significant effects of the interventions on attitudes toward IPV or on IPV behavior. Importantly, however, significance levels and p-values of 0.072 and 0.081 suggest trends in the expected direction, albeit non-significant ones. Combined with our finding that there was substantial heterogeneity in effect sizes, both within and between studies, the picture that seems to emerge is that studies sometimes find significant change on some of their measures of IPV, but not on others, and while some studies suggest significant effects on IPV, others do not. This leads us to conclude that overall effects are small and non-significant, and to recommend future research to carefully examine the conditions under which positive effects (and null effects) are observed.

In terms of the measures used, the Conflict Tactics Scale is typically considered the gold standard among the screening tools for domestic violence (Reddy, 2019). However, in the studies included in this review, the WHO multi-country study questionnaire was the most widely used (44% of included studies in this meta-analysis). Other studies used the DHS questionnaire (14%) and various others (42%). Wording of the items in the DHS questionnaire is fairly similar to the WHO multi-country study questionnaire even though the latter collects more in-depth information and has more items. Some studies added or removed questions to optimize the fit between the questionnaire and their research goals, as indicated by studies sometimes reporting different numbers of items for the same instrument. These variations also make it difficult to reach conclusions about program effectiveness in terms of exactly what IPV behaviors changed, but hopefully allow future research to examine how conclusions regarding intervention effectiveness may depend on the measures used to assess IPV (Petering et al., 2014).

We specifically focused on behavior interventions, in line with previous reviews suggesting promising results for advocacy and behavioral intervention (Gierisch et al., 2013; Ellsberg et al., 2015; Kerr-wilson et al. 2020; Trabold et al. 2018). Our meta-analysis was therefore unable to confirm or refute the finding of previous reviews that interventions that engage with multiple stakeholders can successfully reduce IPV behavior (Heise & Fulu, 2014; Parekh et al., 2012).

Heterogeneity in intervention approaches and frameworks makes comparison across studies challenging, but hopefully allows future research to identify optimal combinations of intervention approaches to reduce IPV in LMICs (e.g., using network meta-analysis).

4.2. Strengths and limitations

A strength of this study is its specific focus on LMICs— indeed countries where prevalence rates of IPV are highest and the need for effective interventions that can be taken to scale is most urgent. In addition, our inclusion of only randomized and quasi-experimental designs mean evidence was generated using relatively rigorous study designs, strengthening our confidence in the validity of our findings. Also, a meta-analysis was performed, providing a more objective appraisal of the evidence than narrative reviews.

Despite these strengths, several limitations should be considered. First, we relied on evidence presented in international peer-reviewed articles. Although this has the advantage that all studies were peer-reviewed before inclusion, we inevitably missed intervention evaluations that were not published in international peer-reviewed journals. Related to this, while we searched globally, we used English search terms, and may have missed studies published in other (e.g., Spanish or French) languages. The results of this study reveal that it is important to conduct moderator analysis, to examine how and to what extent the outcomes depend on one or more studies, sample, and intervention characteristics. However, we did not conduct moderator-analysis in the present review, because these would have been underpowered given the limited number of effect sizes and studies on which the overall effects were based. Besides we did not set out to access individual study level data. Furthermore, the scope of this study was limited to interventions conducted among couples in intimate relationships to ensure sufficient similarity in the target population and interventions, as well as to allow for a more precise estimate of how well this population is served with interventions.

4.3. Implications

All 48 identified studies were reported within the space of less than 10 years (2012–2021). This shows that there is growing research interest in strategies to systematically prevent and respond to IPV in the LMICs, and a movement towards using more rigorous designs to evaluate such strategies. Once the evidence base has had more time to accumulate, it will be important to evaluate differential effects of interventions to target IPV in LMICs. For example, targeting diverse populations, or using different intervention approaches, like structural interventions, as this review only included studies with behavioral approaches.

5. Conclusions

Important progress is being made to generate evidence for the effectiveness of interventions to reduce IPV in LMICs. Effects on IPV behavior and attitudes toward IPV are not clear-cut—overall effects identified in this review were small and non-significant, but trends towards potential benefits and significant heterogeneity, suggesting interventions are effective only under some conditions. Continued rigorous research is needed to improve our understanding of how interventions can best be used to reduce IPV in LMICs.

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CRedit authorship contribution statement

Olusegun Awolaran: Conceptualization, Methodology, Validation, Data curation, Writing – original draft, Writing – review & editing. **Olaide Olubumuyi:** Validation, Writing – review & editing. **Funmilola Olaolorun:** Conceptualization, Writing – review & editing. **Mark Assink:** Formal analysis, Methodology, Writing – review & editing. **Floor van Rooij:** Methodology, Writing – review & editing. **Patty Leijten:** Conceptualization, Methodology, Writing – review & editing, Supervision.

Declaration of competing interest

The authors whose names are listed immediately below certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

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Appendix A. Supplementary data

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