Prev Sci
DOI 10.1007/s11121-012-0314-1

Improving Positive Parenting Skills and Reducing Harsh and Abusive Parenting in Low- and Middle-Income Countries: A Systematic Review

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Abstract Family and youth violence are increasingly recognized as key public health issues in developing countries. Parenting interventions form an important evidence-based strategy for preventing violence, both against and by children, yet most rigorous trials of parenting interventions have been conducted in high-income countries, with far fewer in low- and middle-income countries (LMICs). This systematic review, conducted in line with Cochrane Handbook guidelines, investigated the effectiveness of parenting interventions for reducing harsh/abusive parenting, increasing positive parenting practices, and improving parent–child relationships in LMICs. Attitudes and knowledge were examined as secondary outcomes. A range of databases were systematically searched, and randomized trials included. High heterogeneity precluded meta-analysis, but characteristics of included studies were described according to type of delivery mode and outcome. Twelve studies with 1580 parents in nine countries reported results favoring intervention on a range of parenting measures. The validity of results for most studies is unclear due to substantial or unclear risks of bias. However, findings from the two largest, highest-quality trials suggest parenting interventions may be feasible and effective in improving parent–child interaction and parental knowledge in relation to child development in LMICs, and therefore may be instrumental in addressing prevention of child maltreatment in these settings. Given the well-established evidence base for parenting interventions in high-income countries, and increasingly good evidence for their applicability across cultures and countries, there is now an urgent need for more rigorously evaluated and reported studies, focusing on youth outcomes as well as parenting, adapted for contexts of considerable resource constraints.

Keywords Parenting · Child maltreatment · Violence · Developing countries · Cultural adaptation · Systematic review

This research was supported in part by funding from the Sexual Violence Research Initiative (SVRI), Medical Research Council, South Africa. Portions of this study were submitted as a Master's thesis at Oxford University and presented at the 2011 SVRI Forum, October 10th–13th, Cape Town.

Electronic supplementary material The online version of this article (doi:10.1007/s11121-012-0314-1) contains supplementary material, which is available to authorized users.

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Violence prevention is increasingly recognized as a key public health issue in low- and middle-income countries (Mercy et al. 2008; WHO 2010). Parenting interventions form a key evidence-based strategy for violence prevention in two respects: by reducing violence towards children and by preventing the early development of violent and antisocial behavior in children, for the following reasons. First, there are high rates of child maltreatment in all countries where data are available (Butchart 2006; Mercy et al. 2008), and poor parenting skills are a key risk factor for child maltreatment (Belsky 1993; Tolan et al. 2006). Parenting interventions have been shown to reduce the risk and incidence of child physical maltreatment in low-income environments by enhancing positive parenting skills and providing effective but non-physical forms of discipline (Barlow et al. 2006; Prinz et al. 2009; Webster-Stratton and Reid 2010). Furthermore, parenting interventions

Published online: 12 January 2013

contribute to reducing family stress and maternal mental ill-health (Barlow et al. 2012) - important risk factors for maltreatment.

Second, the effects of harsh and abusive parenting and poor parenting skills on child outcomes are well documented (Gershoff et al. 2012; Hoeve et al. 2009; McMahon et al. 2006). In particular, effective non-violent discipline skills, and positive encouragement and involvement with children have been shown to be crucial, at multiple developmental stages, for predicting lower levels of aggressive and risky behavior (Dishion and Patterson 2006). Evidence about parenting effects is based on powerful, complementary designs: developmental longitudinal studies (Capaldi and Clark 1998; Hoeve et al. 2009) and mediation analyses within randomized trials, testing effects of change in parenting skills on child outcomes (Eddy and Chamberlain 2000; Gardner et al. 2006). In addition to these attempts at testing causal theories, there is a substantial body of evidence from randomized trials showing that skills-based parenting interventions improve youth aggression and antisocial behavior (Furlong et al. 2012; Piquero et al. 2008; McMahon et al. 2006). On the other hand, evidence suggests that the role of parenting knowledge and attitudes in the development of aggressive behavior is modest at best (Holden and Edwards 1989); yet in contexts where knowledge about child development is limited, this may be a necessary first step for behavior change.

Developmental models of parenting influence are not unidirectional: They recognize that temperamental differences in children's behavior also shape parenting, with child aggression and ineffective parenting skills combining into coercive cycles in which mutual hostility and aggression develop and perpetuate over time (Dishion and Patterson 2006; McMahon et al. 2006). Child aggressive behavior tends to be relatively stable across development, suggesting multiple potential windows for prevention, by teaching parents skills to prevent and interrupt these coercive cycles. Not surprisingly, given their emphasis on teaching skills to reduce child and parent aggression, parenting interventions aimed at changing child behavior are often very similar to those known to be effective for preventing maltreatment. In some cases, adaptations are made for very high-risk parents (Barlow et al. 2006; Webster-Stratton and Reid 2010) but not explicitly in others (Prinz et al. 2009). Thus, we argue that parenting interventions are vital for preventing violence both against and by children, and our review focuses on parenting for both intersecting purposes.

The substantial literature on parenting interventions, with many high-quality trials and systematic reviews (Barlow et al. 2006; Furlong et al. 2012; Piquero et al. 2008), comes from high-income countries, and includes many studies that target low-income families and diverse cultural groups. The evidence suggests that effective parenting interventions are potentially adaptable and applicable across cultures, countries and income groups (Kumpfer et al. 2008; Leung et al. 2003; Martinez and Eddy 2005; Matsumoto et al. 2010; Reid et al. 2001). Furthermore, this evidence is underpinned by longitudinal studies, showing that even in low-income contexts, responsive, consistent styles of parenting play a protective role, buffering effects of family and community poverty on children's development, including aggression and violent behavior (Conger et al. 1994; Costello et al. 2003).

Parenting interventions are increasingly being implemented in low- and middle- income countries (Butchart 2006; Eshel et al. 2006; Kumpfer et al. 2008), but there have been few rigorous evaluations. For example, one 'review of reviews' on child maltreatment prevention (Mikton and Butchart 2009) found 298 studies (in 26 reviews), of which all but two were from high-income countries, suggesting that trials of any form of maltreatment prevention are rare in low-income countries.

It should be noted that, although country income categories derive from internationally accepted classifications (World Bank 2010), they hide a good deal of within-country variation. For example, middle-income countries (including those with increasing economic power, such as China and India) are home to some 75% of the world's poor (Summers 2010). Despite this complexity, countries labeled low or middle income tend to share key characteristics such as higher levels of absolute poverty, income inequality (OECD 2012), and violence (Institute of Medicine 2008), and weak health and social protection systems. These factors can place communities, families, and youth at greater risk for violence, pointing to the need for effective parenting interventions in these settings (WHO 2010).

Despite calls from international bodies to expand the evidence base on reducing family violence to include lower-resource settings (Butchart 2006; ISPCAN 2007; UNODC 2009; WHO 2001, 2010), we could find no systematic reviews of parenting interventions aimed at improving parenting skills and relationships in low- and middle-income countries. Existing reviews tend to focus on interventions for child physical and cognitive development, or disease prevention, with limited assessment of harsh or positive parenting outcomes (Baker-Henningham and López Bóo 2010; Engle et al. 2007). Eshel et al.'s (2006) review assessed interventions aimed at improving responsive parenting, but lacked systematic strategies for searching and including studies.

This study addresses the clear need for a systematic review of parenting interventions for reducing harsh or abusive parenting, and increasing positive parenting practices, in low- and middle-income countries. As outcomes of secondary interest, we also include parent attitudes and knowledge.

Methods

This review was conducted using Cochrane Collaboration guidelines (Higgins and Green 2009). Randomized trials were considered for inclusion, with participants that included parents or primary carers of children aged 0–18 years, in countries defined as low- or middle-income by the World Bank (2010). Interventions were those designed to reduce child abuse or harsh parenting, teach positive child behavior management strategies, or improve parent–child attachment and relationships, through specific parenting components or curricula aimed at changing general parenting knowledge, attitudes or skills. Multi-component interventions where parenting intervention was only a minority component were excluded, as were parenting interventions focused on specific health issues (e.g. HIV, malnutrition).

Comparison conditions included 'no intervention,' 'treatment-as-usual' or an alternative intervention. This review focused on (but was not limited to) interventions with the following outcome measures: parent–child relationship, including parental sensitivity, intrusiveness or attachment; parenting skills, behavior, attitudes towards or knowledge about parenting; harsh or abusive parenting and child maltreatment (by child or official reports).

Information Sources

The following electronic databases were searched: Cochrane Library, MEDLINE, EMBASE, CINAHL, PsycINFO, Global Health and ERIC, from inception to May 2010. Search terms were restricted to titles, abstracts and keywords, and differed based on the search platform requirements. Generally the search strategies included filters for population (e.g., parent, family), context (i.e., low- or middle-income, developing countries) and type of study (i.e., randomized trial, intervention). Unpublished reports were sought via Google Scholar, targeted website searches of relevant organizations, and dissertation databases. Reference lists of articles identified were then searched for further studies. Twenty-three parenting experts were contacted to seek potentially relevant unpublished papers.

Study Selection and Data Extraction

Titles and abstracts of studies identified through searches were reviewed to determine whether they met inclusion criteria. Full copies of those that appeared to meet the criteria were assessed by the first author using a data extraction form. Where data were not available in published reports, study authors were contacted to supply missing information.

Assessing Risk of Bias

Critical appraisal of the studies, based on the Cochrane Risk of Bias Tool (Higgins and Green 2009), involved assessing whether there was an adequate method of sequence generation, allocation concealment, blinding of assessors, satisfactory treatment of attrition, including use of 'intention to treat' analysis, and assessment of potential confounders. Given the wide range of measurement instruments in the parenting field, of variable quality (Gardner 2000; Holden and Edwards 1989), it was especially important to assess reliability and validity of outcome measurement and associated risk of bias related to reporting agent. In studies for which effect sizes (Cohen 1988*)* were not reported, they were calculated for reports which provided scores for *T*-tests, or *F*-tests with one degree of freedom, and size of intervention and control groups (Thalheimer and Cook 2002). Due to substantial differences in populations, settings, outcomes, analyses and reporting of studies, meta-analysis was not possible. Where appropriate, characteristics of included studies are discussed narratively according to delivery mode (e.g., home vs. clinic-based), and outcome data and trends of effect are described narratively where possible (see Table 2).

Results

From more than 24,000 studies identified in initial searches of published and unpublished literature, 66 potentially eligible references were scanned, 54 of which were excluded; for example, because the intervention aimed to address a specific child or parent health issue (e.g. preterm birth, malnourishment, HIV/AIDS); or parenting components were only a small part of the intervention. The remaining 12 studies were included: Aracena et al. 2009; Cooper et al. 2009; Jin et al. 2007; Kagitcibasi et al. 2001; Klein and Rye 2004; Magwaza and Edwards 1991; Oveisi et al. 2010; Powell and Grantham-McGregor 1989; Rahman et al. 2009; Teferra and Tekle 1996; Van Wyk et al. 1983; Wendland-Carro et al. 1999.

Study Characteristics

Design and Sample Size Eleven of the 12 included studies were randomized by individual, and 1 was cluster-randomized by village (Rahman et al. 2009). Sample sizes ranged from N=26 (Van Wyk et al. 1983) to N=449 (Cooper et al. 2009), with most between 30 and 100 participants. Three studies had very small samples (N< 50), and only two (Cooper et al. 2009; Rahman et al. 2009) reported a power calculation.

Settings and Participants The studies took place in nine countries, eight of which were classified as middle-income (one study each in Brazil, Chile, China, Iran, Jamaica, Pakistan and Turkey; three in South Africa) and one as low-income (two studies in Ethiopia). Participants were mostly mothers, while four included only pregnant women (Aracena et al. 2009; Cooper et al. 2009; Rahman et al. 2009) or new mothers a few days after giving birth (Wendland-Carro et al. 1999). The two studies from Ethiopia were aimed primarily at mothers, but some fathers and other family members also participated (Klein and Rye 2004; Teferra and Tekle 1996). Children ranged in age from 0 to 12 years old, with the majority under 3 years. Eligibility of participants was determined by residence (e.g., shantytown), by day-care provided to children (Kagitcibasi et al. 2001), child age (Magwaza and Edwards 1991) or attendance of urban health centres (Oveisi et al. 2010; Wendland-Carro et al. 1999). Most study participants were literate and had received at least some primary schooling. Socioeconomic status was based largely on income levels or housing conditions, and generally characterized as low-income or 'disadvantaged', with the exception of the study from Brazil (Wendland-Carro et al. 1999) and one from South Africa (Van Wyk et al. 1983). Socioeconomic status was unclear in the study from Iran (Oveisi et al. 2010) (Table 1).

Intervention Package Most intervention packages were delivered to individuals through home visiting; two were delivered to groups of parents, in community settings or workplaces (Kagitcibasi et al. 2001; Van Wyk et al. 1983); and two combined home visits with group-based delivery (Klein and Rye 2004; Teferra and Tekle 1996). Three of the home-visiting interventions (Aracena et al. 2009; Powell and Grantham-McGregor 1989; Rahman et al. 2009) were added to existing health services, while two others (Oveisi et al. 2010; Wendland-Carro et al. 1999) were delivered through health clinics and were added to existing services. The remaining seven studies involved stand-alone interventions that were not part of any existing service. Most interventions were delivered by paraprofessionals or professionals, and only one (Cooper et al. 2009) was delivered by lay persons. On average, interventions were delivered for a period of 3 to 6 months, in 5 to 15 sessions. Control groups in most of the studies received services 'as usual' or no services; while three studies (Klein and Rye 2004; Magwaza and Edwards 1991; Wendland-Carro et al. 1999) provided alternative services. Components common to many included studies were: individual counseling or group discussion; cognitive-behavioral strategies such as role play; videotape modeling of positive parenting; structured or guided mother-child play, including games and songs; educational communications materials which model or guide positive behaviors (e.g., illustrations depicting positive childrearing); and use of toys made from readily available objects or materials (e.g., pots, kitchen utensils, scrap fabric).

Eight studies involved adaptations of interventions originally developed in high-income countries (Aracena

Table 1 Characteristics of participants in included studies

Study	Country	Participants			Sample size (*n*)
		Parent/Carer	Child age	Socioeconomic status	
Aracena et al. 2009	Chile	Pregnant women	0–12 month	Extremely poor neighborhoods	104
Cooper et al. 2009	South Africa	Pregnant women	0–6 month	Live in shacks, very high unemployment, poverty	449
Jin et al. 2007	China	Mothers	0–2 year	Most live in poverty	100
Kagitcibasi et al. 2001	Turkey	Mothers	3–5 year	Squatter housing in urban shantytown; low income	280
Klein and Rye 2004	Ethiopia	Families	1–3 year	Urban slums, overcrowded households, poor sanitation; some live at subsistence levels	96
Magwaza and Edwards 1991	South Africa	Mothers	mean =4.5 year	Disadvantaged	90
Oveisi et al. 2010	Iran	Mothers	2–6 year	Most fathers employed	272
Powell and Grantham-McGregor 1989	Jamaica	Mothers	16–30 month	Below-average housing (e.g., poor sanitation, overcrowding)	58
Rahman et al. 2009	Pakistan	Pregnant women	0–3 month	Many live on income from subsistence farming	334
Teferra and Tekle 1996	Ethiopia	Families	6 month–3 year	Urban slums, overcrowded households, poor sanitation; some live at subsistence levels	30
Van Wyk et al. 1983	South Africa	Mothers	8–12 year	Advantaged	26
Wendland-Carro et al. 1999	Brazil	New mothers	2–3 days	'Low'/'median' housing conditions	38

et al. 2009; Cooper et al. 2009; Klein and Rye 2004; Magwaza and Edwards 1991; Oveisi et al. 2010; Rahman et al. 2009; Teferra and Tekle 1996; Wendland-Carro et al. 1999). One intervention originated in a developing country (Powell and Grantham-McGregor 1989), and the study from China (Jin et al. 2007) was based on a WHO/UNICEF program that has been implemented in many developing countries. Very few interventions had a high-quality evidence-base (i.e., found effective in prior randomized trials) in the countries where they were developed.

In light of differences between high-income and low- and middle-income countries in parenting and family context, it is worth noting some of the ways that the interventions were adapted to suit the study settings or populations. For example, the 'Learning Through Play' program, adapted for use in Pakistan utilizes a pictorial calendar featuring information about child development, "a relatively inexpensive and simple tool that relies minimally on the literacy of parents" (Rahman et al. 2009, p. 57). In China, Jin et al. tested the 'Care for Development' (CFD) package, which features a pictorial counseling aid ('Mother's Card') with drawings and language suitable for mothers who may have a low educational level (Jin et al. 2007). CFD also involves encouraging parents to play with children using materials available around the home. While these are examples of intervention suitability for economically constrained settings, most studies provided minimal information on adaptations related to culturally specific parenting practices. The only exceptions were a few studies which drew attention to the importance of extensive piloting (Cooper et al. 2009; Rahman et al. 2009), or the need to involve extended family members (Klein and Rye 2004).

Outcomes The included studies measured 10 different parenting outcomes relevant to this review, at intervals of between 1 month and 6 years post-intervention, with most between 1 and 6 months. These measures fell under four categories: positive parent–child interaction; negative or harsh parenting; abusive parenting; and parent attitude or knowledge. Parent–child interaction included maternal sensitivity, engagement and communication with the child. Notably only two studies reported data from validated direct observational methods (Cooper et al. 2009; Wendland-Carro et al. 1999), even though these are considered a 'gold standard' for measuring parenting (Gardner 2000). In both trials, these covered positive, rather than harsh dimensions of parenting. Other studies used observational methods but did not describe instruments used, nor report on outcomes, or on inter-observer reliability or blinding of raters (Klein and Rye 2004; Magwaza and Edwards 1991; Teferra and Tekle 1996). Some studies used self-report measures (Kagitcibasi et al. 2001; Van Wyk et al. 1983), which are more open to reporting bias than observations (Gardner 2000), as it is possible for the latter to be conducted by blinded raters.

Negative or harsh outcomes included measures of 'dysfunctional parenting' (Oveisi et al. 2010) and parents' perceptions of the use of harsh discipline such as spanking or beating (Kagitcibasi et al. 2001). These were assessed through self-report measures, which although in one case had good evidence of reliability and validity (Oveisi et al. 2010), are nevertheless open to substantial reporting bias. Abusive parenting was assessed in only one study, based on official reports of abuse (Aracena et al. 2009).

Measures of parent attitude and knowledge assessed parental awareness of appropriate child development and behavior, using self-report. In one case, the scale was validated for use with the study population (Aracena et al. 2009), but reliability and validity were unclear for other scales (Jin et al. 2007; Rahman et al. 2009). It is important to note, however, that little is known about the impact on children of change in parents' knowledge and attitudes, as they do not necessarily predict change in parent behavior (Holden and Edwards 1989).

Results of Individual Studies

Studies included in this review varied greatly in intervention design, outcome measures, time points and methodological quality, presenting a level of heterogeneity that precluded meta-analysis (Glass et al. 1981). Therefore, we provide a narrative overview of effects (Table 2). Effect sizes (Cohen's *d*) were provided by study authors or could be calculated for 8 of the 17 outcome measures reported in the included studies; while confidence intervals were reported in only two studies (Cooper et al. 2009; Rahman et al. 2009), for three outcome measures.

Synthesis of Results: Intervention Compared to No-treatment or Treatment-as-usual

Outcome Category: Positive Parent–Child Interaction Five studies evaluated the effects of intervention, compared to a no-treatment or treatment-as-usual control group, on measures of parent–child interaction. Most used self-reported measures of parenting (Kagitcibasi et al. 2001; Magwaza and Edwards 1991; Teferra and Tekle 1996; Van Wyk et al. 1983). All studies reported significant ($p<.05$), positive effects of the intervention on parent–child interaction at all time points, which ranged from 1 month ($p<.001$, Van Wyk et al. 1983) to 6 years ($p=.001$, Kagitcibasi et al. 2001). Effect sizes were provided or could be calculated for four of the seven parent–child interaction outcomes, and ranged from .24 (small) in the study with the largest sample (Cooper et al. 2009, using observational measures) to 1.59 (large), in the smallest study ($N=26$, Van Wyk et al. 1983).

Table 2 Outcomes and effects of parenting interventions

Study	Sample (n)	Outcome measures	Scale *Observed/Parent Self-report/ Other/Unclear*	Follow up	Effect size[1,2,3] [95% CI (if available)]	Summary of effects
Effects of parenting interventions on *parent–child interaction* compared to no treatment/treatment-as-usual						
Cooper et al. 2009	449	Maternal sensitivity	Parent/Caregiver Involvement scale *Observed*	6 month 12 month	Small (d=.24)* [.048 to 1.492] Small (d=.26)* [.058 to 1.278]	Small effect of intervention compared to control at 6- (p=.037) and 12-month (p=.043) follow-up
		Maternal intrusiveness	Parent/Caregiver Involvement scale *Observed*	6 month 12 month	Small (d=.26)* [.093 to 1.278] Small (d=.24)* [-3.466 to -.058]	Small effect of intervention compared to control at 6- (p=.024) and 12-month (p=.023) follow-up
Kagitcibasi et al. 2001	280	Maternal orientation to/ interaction with child	Structured interviews *Self-reported*	4 year	–	Effect on mother involvement/attention to child (p<.05 or .01); less punitive discipline compared to control
		Parent–child communication	Not specified *Unclear*	6 year	Small (d=.44)***	Small effect (p=.001) of intervention compared to control at 6-year follow-up
Teferra and Tekle 1996	30	Frequency of 'mediational' mother–child interaction	Mediational Intervention *Observed*	3 month	–	No data but authors suggest sig improvement in frequency of mother–child interaction compared to control
Van Wyk et al. 1983	26	Parent interpersonal sensitivity	Group Assessment of Interpersonal Traits; Sensitivity to Children Questionnaire *Self-reported*	1 month	Large (d=1.59**)	Large effect (p<.001) on parental sensitivity and parent–child communication in intervention group compared to control
Effects of parenting interventions on n*egative or harsh parenting* compared to no treatment or TAU						
Oveisi et al. 2010	272	Dysfunctional parenting practices	Parenting Scales *Self-reported*	2 month	Large (d=1.2)*	Large effect (p=.001) compared to control
		Level of abusive child training	Parent–child Conflict Tactics Scale *Self-reported*	2 month	Moderate (d=.50)*	Moderate effect (p=.002) compared to control
Kagitcibasi et al. 2001	280	Parents' perceptions of child behavior/ use of harsh discipline	*Unclear*	6 year	Small (d=.28)***	Small effect (p=.026) compared to control
Effects of parenting interventions on *abusive parenting* compared to TAU						
Aracena et al. 2009	104	Indicators of child abuse	Social service records *Other*	15 month	–	No effects (no reports of abuse found for intervention or control groups)
Effects of parenting interventions on *parent attitude or knowledge* compared to no treatment/TAU						
Aracena et al. 2009	104	Family function	'What's your family like?' *Self-reported*	15 month	–	No effect (p=.76)
Jin et al. 2007	100	Family knowledge/attitude/practice re. child development	Bespoke questionnaire *Self-reported*	6 month	–	No data reported
		Mother understanding re child development	Bespoke questionnaire *Self-reported*	6 month	–	Effect of intervention compared to control (P<.01)
Rahman et al. 2009	334	Mother knowledge/attitude re child development	Infant Development Questionnaire *Self-reported*	6 month	– [3.68 to 4.89]	Effect of intervention compared to control (p<.0001)
Effects of parenting interventions on *parent–child interaction* compared to alternative treatment						
Klein and Rye 2004	96	Parent–child interaction	Mediational Interaction; MacArthur scale *Both observed*	3 month	Medium (d=.66)[4] **	Effect of intervention compared to alternative treatment for 7 of 9 measures (p=.0001–.07)

Table 2 (continued)

Study	Sample (n)	Outcome measures	Scale *Observed/Parent Self-report/ Other/Unclear*	Follow up	Effect size[1,2,3] [95% CI (if available)]	Summary of effects
Magwaza and Edwards 1991	90	Mother–child interaction	Response Class Matrix *Unclear*	2.5 month 12 month	– –	No data provided; attempts to contact author unsuccessful.
Wendland-Carro et al. 1999	38	Mother–infant synchronous responsiveness	Coding system (Isabella et al. 1989) *Observed*	1 month	–	Effect on positive & asynchronous (less) mother–infant interaction in treatment (video) compared to control ($p<.01$)

[1] Cohen's *d*

[2] Effect sizes were calculated where sufficient data were available; where authors reported effect size, these were verified where possible. '–' indicates data were not available or were insufficient to calculate effect size

[3] *Calculated by study authors; **Calculated by review authors using *F* values; ***Calculated by review authors using means and standard deviations

[4] This is an average of effect sizes of the intervention on nine different parental behaviors

Outcome Category: Negative or Harsh Parenting Two studies evaluated the effects of intervention compared to a no-treatment or treatment-as-usual control group, on measures of self-reported harsh or abusive parenting (Kagitcibasi et al. 2001; Oveisi et al. 2010). Both studies reported significant ($p<.03$), positive effects of the intervention in reducing dysfunctional or harsh parenting at all time points, which ranged from 2 months in the study from Iran (Oveisi et al. 2010) to 6 years in the study from Turkey (Kagitcibasi et al. 2001). Effect sizes were provided or could be calculated for all three of the outcomes in this category, and ranged from .28 (small) to 1.2 (large). The only potential pattern with regard to effect sizes was that the study with the longest follow up, 6 years (Kagitcibasi et al. 2001), produced the smallest effect size ($d=.28$).

Outcome Category: Abusive Parenting One study evaluated the effects of intervention on official reports of child abuse (Aracena et al. 2009) compared to treatment as usual. It found no cases of abuse or negligence reported for either the treatment or control group at 15-month follow up. An effect size could not be calculated for this outcome measure.

Outcome Category: Parent Attitude or Knowledge Three studies evaluated the effects of intervention, compared to a no-treatment or treatment-as-usual control group, on self-reported measures of parent attitude or knowledge (Aracena et al. 2009; Jin et al. 2007; Rahman et al. 2009). The study from China (Jin et al. 2007) measured 'family knowledge, attitudes or practice', and correlated the results with child development measures. However, actual data on family knowledge and practice were not reported, nor did the authors report any conclusions about effects on family knowledge, attitudes or practice. Of the remaining three outcomes in this category, the study from Chile (Aracena et al. 2009) reported a non-significant effect on parent attitude or knowledge compared to control ($p=.76$); and the other two (from China and Pakistan) reported a significant, positive effect ($p<.01$). Effect sizes were not provided and could not be calculated for outcomes in this category.

Intervention Compared to Alternative Treatment

Outcome Category: Increase or Improvement in Parent–Child Interaction Three studies evaluated the effects of intervention, compared to a control group which received alternative treatment or services, on measures of parent–child interaction (Klein and Rye 2004; Magwaza and Edwards 1991; Wendland-Carro et al. 1999). One study from South Africa (Magwaza and Edwards 1991) reported measuring parent–child interaction for use as an 'assessment tool' but did not

report its results, which might suggest a risk of reporting bias. One study from Ethiopia (Klein and Rye 2004) reported outcome data, measured at 3 months post-intervention, for nine different measures of parent–child interaction. Seven of these were significant in favor of intervention ($p<.02$) and two were non-significant ($p>.05$); the average effect size of the intervention (home visits with parent training) compared to control (home visits with basic child care) was calculated as medium ($d=.66$). The study from Brazil (Wendland-Carro et al. 1999) reported significant ($p<.01$), positive effects of intervention on observed mother–infant 'synchronous responsiveness' 1 month after intervention; however, an effect size was not provided and could not be calculated.

Risk of Bias Across Studies (Table 3)

The body of evidence in this review comes from 12 RCTs, involving 1580 parents in nine countries. Most studies had very small sample sizes and only two reported a power calculation, thus it is impossible to determine if the other ten studies were adequately powered. In most studies there was also poor reporting or poor quality with respect to: methods of sequence generation and allocation concealment; incomplete outcome data; baseline demographic data; reliance on self-reported outcomes and poor reliability and validity of instruments used to measure outcomes. Therefore, internal validity of the totality of studies is unclear and likely to be poor. However, the studies by Rahman et al. (2009) (albeit using only measures of maternal knowledge), Wendland-Carro et al. (1999) (although with a small sample size, $N=36$), and Cooper et al. (2009), which together include more than 800 mothers in Pakistan, South Africa, and Brazil, are notable exceptions, assessed as having a low risk of bias and therefore relatively reliable and valid results.

Discussion

Summary of Evidence

Overall, studies reviewed reported results favoring the intervention group on a range of parenting measures, including parent–child interaction, parent attitudes and knowledge, and reductions in harsh parenting. This suggests parenting interventions hold some promise for improving parenting practices and reducing risk factors for child maltreatment in low- and middle-income countries. However, only two trials had large sample sizes and were judged to be at low risk of bias: Cooper et al.'s (2009; $n=449$) in South Africa and Rahman et al.'s (2009; $n=334$) in Pakistan. They indicate that parenting interventions can be both feasible and effective in improving parent–child interaction and parental knowledge, respectively. Cooper et al.'s (2009) study used an established, reliable observational measure of parent–child interaction, and showed effects on intrusive as well as positive parenting style. While Rahman et al.'s (2009) study did not report published information about scale reliability, their self-report measure of mothers' knowledge of child development was based on lengthy piloting; although knowledge is likely to be helpful for skilled parenting, we do not know if these changes affect parenting behavior. Components and outcomes of both studies were informed by piloting with similar populations.

Table 3 Risk of bias in included studies

Study	Country	Adequate sequence generation?	Allocation concealment?	Blinding?	Free of other bias?
Aracena et al. 2009	Chile	?	?	?	–
Cooper et al. 2009	South Africa	+	+	+	+
Jin et al. 2007	China	?	?	–	–
Kagitcibasi et al. 2001	Turkey	+	?	+	–
Klein and Rye 2004	Ethiopia	?	?	+	–
Magwaza and Edwards 1991	South Africa	?	?	–	–
Oveisi et al. 2010	Iran	?	?	?	–
Powell and Grantham-McGregor 1989	Jamaica	?	?	+	+
Rahman et al. 2009	Pakistan	+	+	+	+
Teferra and Tekle 1996	Ethiopia	?	?	?	–
Van Wyk et al. 1983	South Africa	?	?	?	–
Wendland-Carro et al. 1999	Brazil	+	+	+	–
		Key:	Yes	Unclear	No
			+	?	–

Limitations of This Review

Lack of common terms for parenting interventions in low- and middle-income countries posed challenges for the literature search. While efforts were made to identify unpublished studies through extensive grey literature searching, and contacting experts, some studies may have been missed. Authors of included studies with missing information were contacted, but only three responded; two could not be contacted (Van Wyk et al. 1983; Magwaza and Edwards 1991). Although non-English-language databases could not be searched, there were no language limitations, and searches did not identify any relevant non-English-language studies. Finally, study heterogeneity made narrative synthesis a major challenge and compromised comparability. Although we focused on parenting rather than child behavior outcomes, it is worth noting that no study was excluded that tested parenting intervention effects on child aggression or conduct problems, and no included study reported standardized measures of these outcomes.

Recommendations for Research

This review shows the need for more and more rigorously evaluated interventions, especially better study design and reporting of randomization, allocation concealment, blinding and treatment of missing data. There is also a need for standardized, comparable outcome measures, where possible using direct observational assessment of parenting which, if conducted by blind raters, reduces the risk of bias inherent in self-report measures. Outcome measures should be validated cross-culturally, to ensure they are appropriate for the study population. More, higher-quality studies of parents with children 2 years and older is recommended; importantly, this would allow assessment of child behavior outcomes. Trials should report details of poverty level of participants, because existing systems for classifying countries (e.g., as low- or high-income) hide significant within-country variation.

Adaptation and Implementation in Low- and Middle-Income Countries

While limited conclusions can be drawn from this review as a whole, the studies from South Africa (Cooper et al. 2009), Pakistan (Rahman et al. 2009) and, to some extent, Brazil (Wendland-Carro et al. 1999), provide examples of high quality implementation and research design in low-resource settings, as well as showing beneficial impact on parenting outcomes. The trials in South Africa and Pakistan indicate the feasibility of using non-professional local staff, delivery through home visits and adding interventions to routine services for pregnant women and new mothers. These factors are of particular relevance in low-resource settings, where professional staffing is often not feasible or affordable at scale; health facilities may be inaccessible for many, particularly in rural areas or countries with weak health systems; and use of existing service delivery mechanisms (e.g., lay home visitors, antenatal services) may be more cost-effective, and more familiar and acceptable to local populations.

Many of the included studies implemented interventions that were transported from one country to another, yet lacked good evidence of efficacy in the countries in which they originated. No studies were found of well-known evidence-based programs – those that have been replicated in RCTs in many countries – such as Incredible Years (Gardner et al. 2006); PMTO (Martinez and Eddy 2005; Ogden et al. 2005); or Triple P (Leung et al. 2003; Sanders et al. 2002). Yet there are indications, particularly from the innovative work on implementing the Strengthening Families Program in developing countries (Kumpfer et al. 2008), that many of these programs would be feasible, acceptable and effective if adapted to other cultures and settings. For example, there is good evidence of these interventions being flexible and effective across cultural groups within high-income countries (Martinez and Eddy 2005; Reid et al. 2001; Turner et al. 2007; Webster-Stratton 2009), and a growing body of evidence on their transportability across countries (Ogden et al. 2005). Triple P has been found effective in trials in Hong Kong and Japan (Leung et al. 2003; Matsumoto et al. 2010), and Strengthening Families Program has been used in several developing countries (Kumpfer et al. 2008; UNODC 2009). These studies also contribute to our understanding of the complexities of cultural influences on parenting and child outcomes. Surveys have found wide variation between developing countries in practices and beliefs (Runyan et al. 2010), and yet in some countries where parents report high levels of child beating, a high percentage also express the belief that it is unacceptable (UNICEF 2010), suggesting that parents in these cultures may be open to learning alternative discipline techniques. It has also been argued that in cultural groups where physical punishment is more acceptable, then it may have fewer adverse effects on child outcomes. Evidence is mixed on this question: Early US studies showed that adverse effects of physical punishment on child aggression applied to white but not African-American families (Deater-Deckard and Dodge 1997); however, a study in a much larger representative US sample found no such moderation by ethnicity (Gershoff et al. 2012). Intervention studies that show effectiveness across cultural groups raise the perhaps surprising possibility that some high-quality interventions may be sufficiently flexible to address culturally diverse parenting challenges and produce positive outcomes, despite cultural differences in parenting norms or risk factors for problem behavior (Reid et al. 2001).

Of course, adoption and adaptation of evidence-based interventions in low-resource settings may be influenced by many factors as well as cultural beliefs about parenting and child behavior, including: family structures (e.g., extended families; living with non-biological carers); language and literacy; poverty and other health, social and structural pressures, including the impact of HIV/AIDS on families, and its effects on poverty and abuse (Cluver et al. 2011); and practical issues such as lack of water or electricity, or safety issues in areas of high violence. To address these barriers, donors, policymakers and researchers should ensure that trials of adapted parenting interventions include extensive qualitative and pilot testing, as demonstrated, for example, in Baker-Henningham's et al.'s (2011, 2012) cluster-randomized trial of the Incredible Years Teacher program in Jamaica. In many cases, adaptations have addressed these barriers by altering the 'surface' rather than 'deep' structure (Castro et al. 2004) of existing programs, to make them more relevant to the community, for example by introducing culturally appropriate group rituals (Kumpfer et al. 2008), using role play or stories instead of videos (Baker-Henningham 2011), or altering the language or literacy level of the materials (Rahman et al. 2009). Adaptations at this level are likely to be helpful and feasible, without compromising fidelity of the intervention, as they need not involve changing the underlying program theory. It remains an empirical question as to whether underlying program theories need to be changed to successfully 'transport' parenting interventions from high- to low-income countries. However, the evidence from this review, and from studies showing cross-country and cross-cultural flexibility, acceptability and effectiveness of evidence-based programs (e.g., Incredible Years, Triple P), as argued earlier, is promising in suggesting that major adaptation may not be needed.

It should also be noted that materials, training and support for some of the most rigorously tested, manualized parenting interventions (e.g., Triple P, Incredible Years) may be considered costly for organizations or public service agencies with limited resources, which could be a barrier to adoption of these interventions in low-resource settings. Developers of interventions, international donors and other stakeholders may wish to investigate whether waivers could be made available to promote the adoption and adaptation of evidence-based parenting interventions in these settings; or versions of interventions which have been adapted for these settings could be made available at reduced fees.

As part of a strategy for building an evidence-based approach to violence prevention in low- and middle-income countries, future work on parenting interventions should draw on the body of knowledge about parenting influences on children's development, and cultural variation in parenting; and it should continue to build on the existing international evidence about culturally sensitive, flexible and effective programs, adapted for contexts with considerable resource constraints. So that extremely scare resources are not wasted, interventions must be thoroughly pilot tested for applicability, followed by evaluation to the highest standards of rigor, in randomized trials.

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