

Physical punishment and its outcomes for children: a narrative review of prospective studies

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Summary

Physical punishment is increasingly viewed as a form of violence that harms children. This narrative review summarises the findings of 69 prospective longitudinal studies to inform practitioners and policymakers about physical punishment's outcomes. Our review identified seven key themes. First, physical punishment consistently predicts increases in child behaviour problems over time. Second, physical punishment is not associated with positive outcomes over time. Third, physical punishment increases the risk of involvement with child protective services. Fourth, the only evidence of children eliciting physical punishment is for externalising behaviour. Fifth, physical punishment predicts worsening behaviour over time in quasi-experimental studies. Sixth, associations between physical punishment and detrimental child outcomes are robust across child and parent characteristics. Finally, there is some evidence of a dose-response relationship. The consistency of these findings indicates that physical punishment is harmful to children and that policy remedies are warranted.

Introduction

The WHO-UNICEF-Lancet Commission on children has highlighted social, economic, commercial and environmental threats to child health and has called for urgent government action to ensure that children grow up in safe and healthy environments.¹ Yet the home environments of a majority of children around the world are not safe because they include physical punishment. The UN Committee on the Rights of the Child has definitively stated that physical punishment is a form of violence that violates children's rights to protection, dignity, and physical security.² The UN General Assembly has also included the protection of children from all forms of violence as Sustainable Development Goal 16.2.³ Such human rights arguments, along with an aligned body of research indicating physical punishment is harmful to children,⁴⁻⁶ have led to a growing consensus among health professionals that physical punishment of children is harmful and ineffective⁷⁻⁹ and have led 61 countries to prohibit physical punishment of children in all settings and a further 27 countries to commit to doing so.¹⁰

The majority of the world's children live in countries where physical punishment is allowed by law; as a result, sixty-three percent of children aged two to four years – 250 million children – are regularly subjected to physical punishment by their caregivers.¹¹ The continued prevalence of physical punishment suggests that parents are not receiving – or not believing – the message that it is both ineffective and potentially harmful to their children's health and development. This may be because the research to date is summarised in hundreds of specialist research studies or in detailed meta-analyses^{5,12-14} that are not easily accessible to health professionals whom parents consult for advice about discipline.¹⁵ It is also true that the majority of countries have not prohibited physical punishment in homes, schools, or both. Policymakers may not be aware of the strength of the research evidence against physical punishment or of the likelihood that legislating against physical punishment would prevent harm to children.

The purpose of this narrative review is thus to summarise the last two decades of research on physical punishment in a format that is accessible to policymakers, community leaders, and practitioners. Although psychological punishments such as yelling, humiliating, or shaming children are also prevalent around the world¹¹ and are harmful to children,¹⁶ we focused our review on physical punishment in response to growing interest around the world in legislating against its use.

Three strategic decisions guided our review. First, we began our review with studies published in 2002, the year the first comprehensive meta-analysis of physical punishment research was published.¹² Second, we only included studies that examined physical punishment specifically and excluded studies of severe assaults against children. Third, we restricted our review to longitudinal studies that followed children prospectively and took initial levels of the outcome into account,

thereby meeting the minimum criterion for causality that physical punishment must precede the measured outcome in time and to address concerns regarding the possibility of reverse causality.¹⁷ Our search strategy and study selection criteria are presented in Box 2.

[Box 2 (Search strategy and selection criteria)]

Search strategy and selection criteria

We conducted a literature search of MEDLINE, PsycINFO, and Web of Science in June 2020 and updated the search in October 2020. The search terms were “physical discipline”, “physical punishment”, “corporal punishment”, “physical chastisement”, “smack”, “spank”, and “slap”. The search syntax for each database can be found in Appendix Table A1.

We searched for articles published from 2002 onwards and did not restrict by language or country. We also identified articles from reference lists of earlier reviews and through expert authors. Included studies were peer reviewed; assessed one or more outcomes measured in childhood (up to age 18 years); measured physical punishment by a parent or parental figure (i.e., not a teacher); only included parent behaviours that fit our operationalisation of physical punishment; and reported empirical findings from quantitative, prospective designs that adjusted for initial levels of the outcome(s) under study.

We excluded studies that examined severe forms of physical punishment, such as: hitting a child with an object; hitting or slapping on the face, head, or ears; throwing an object at a child; beating; hitting with a fist; punching; kicking; washing a child’s mouth out with soap; throwing down; choking; burning; scalding; and threatening with a knife or gun. We also excluded studies that did not distinguish between physical and verbal forms of punishment. Where necessary, study authors were contacted for details to ensure inclusion criteria were met.

After initial database searches and removal of duplicate articles, all records were divided between two reviewers (AH and AM), who conducted an initial title screen to exclude irrelevant records that did not relate to physical punishment of children by a parent. Remaining articles were subject to abstract and full text screening through blind review by AH and AM. Studies were included if both reviewers agreed that inclusion criteria were met. In case of disagreement, consensus was reached through discussion and, where required, a third reviewer (EG).

For the included studies, data on key study characteristics and findings were extracted (see Appendix Table A2). We then summarised these characteristics and findings for each outcome category and analysed patterns to identify key themes. Given that some studies utilised the same datasets, we report findings for independent samples or datasets rather than individual studies.

Findings

The database searches identified 3,855 unduplicated records, of which 2,198 were excluded after initial title screening. An additional five studies were identified through Web of Science search alerts and expert communication. After two independent reviewers assessed 1,303 abstracts and 359 full texts, they identified 68 articles describing 69 studies (one article reported on two samples) that met the inclusion criteria. These were retained for review (Figure 1).

[Figure 1 here]

The field is heavily dominated by research from the USA (60 articles), including a large number of studies that utilised the same datasets; for example, 23 studies used the Fragile Families and Child Wellbeing Study (FFCWS), and eight studies used the National Longitudinal Survey of Youth (NLSY). The remaining eight studies came from Canada, China, Colombia, Greece, Japan, Switzerland, Turkey, and the UK. No non-English studies met the inclusion criteria. Characteristics of included studies are provided in Appendix Table A2.

We describe outcome measures using the terminology adopted by authors of the original research. We grouped studies into nine broad categories: externalising behaviours (behavioural difficulties that manifest outwardly and refer to acts towards the external environment that violate social norms and/or are harmful to others),^{18,19} internalising behaviours (behaviours that are directed inward, including symptoms of anxiety and depression, withdrawal, fearfulness and somatic complaints),^{18,19} total behaviour difficulties (composite measures of both externalising and internalising), prosocial behaviours, inattention / ADHD symptoms, cognitive abilities, interpersonal relationships, stress reactivity, and involvement with child protective services (CPS).

An overview of the included studies is presented in Table 1. Many studies examined more than one outcome, such that 98 effect sizes were presented across the studies. In addition, some outcomes were examined multiple times with the same dataset; to ensure the independence of the findings within each outcome category, each dataset was counted only once per outcome. When multiple studies from the same dataset had discrepant findings, the majority finding was coded. For example, of the three studies that used the FFCWS to examine cognitive abilities, one found a detrimental effect and two found no significant association; FFCWS was counted only once in Table 1 in the row for cognitive abilities as having no association. With each independent dataset counted only once per outcome, the total number of effect sizes was 64.

Based on conventional significance thresholds ($p < 0.05$), physical punishment was associated with worse outcomes over time in 38 independent samples (59.0%). No statistically significant associations were found in 15 independent samples (23.1%). None of the studies reported main

effects of beneficial child outcomes associated with physical punishment. Mixed findings were reported in 11 independent samples (16.9%), however, associations between physical punishment and beneficial outcomes were only found in four subgroups across all studies (see Appendix Table A2 for details).

[Table 1 here]

Externalising behaviours

Externalising behaviours were by far the most studied outcomes. The majority of studies used advanced statistical methods, including structural equation models, fixed effects models, growth curve models, and propensity score matching. Almost all adjusted for a wide range of covariates. Some studies examined the broad category of externalising behaviours while others examined subcategories, such as aggression.

Externalising behaviour, typically measured via standardised questionnaires such as the Achenbach Child Behavior Checklist,²⁰ was the outcome in 27 studies from 19 independent samples with follow-up periods of up to 12 years. These included five studies using FFCWS data,²¹⁻²⁵ two studies using the US Early Childhood Longitudinal Study – Kindergarten Class of 1998-1999 (ECLS-K),^{26,27} and three studies using data from the US Child Development Project.²⁸⁻³⁰ Apart from one Chinese,³¹ one Greek,³² and one Turkish³³ study, all research on externalising behaviour came from the USA.

In 13 of the 19 independent samples, physical punishment was associated with increases in externalising behaviour over time.^{21-28,30,33-42} In three independent samples, no associations were identified.^{29,43-45} Mixed findings were reported in another three independent samples^{31,32,46}.

Children's aggressive behaviour was assessed in 20 studies and six independent samples. Most were conducted in early childhood. In five of the six samples, physical punishment predicted increases in aggressive behaviour over time. Fifteen studies used FFCWS data with consistent findings of detrimental impacts of physical punishment across different analytic methods and age groups.⁴⁷⁻⁶¹ Associations with increases in aggressive behaviours were observed in four of the remaining five independent samples, including in Canada,⁶² Switzerland,⁶³ and the USA.^{64,65} Only one study found no association between physical punishment and aggressive behaviour.⁶⁶

Antisocial behaviour and conduct problems were assessed in eight studies from five independent samples. Follow-up periods ranged from two to 12 years. Four studies analysed NLSY data, with conflicting results: physical punishment predicted increases in antisocial behaviour in two studies,^{67,68} while the other two studies found no associations.^{69,70} The remaining four studies on independent samples found associations between physical punishment and increases in antisocial behaviour,⁷¹ conduct problems,^{62,72} and oppositional defiant disorder symptoms.⁷³

Internalising behaviours

Internalising behaviour was the outcome in 15 studies from ten independent samples. Apart from one study that measured depressive symptoms,⁷² all studies reported on an overall measure of internalising behaviour symptoms. Six studies analysed data from the US Fragile Families and Child Wellbeing Study (FFCWS).^{24,25,49,54,56,57} Most studies were conducted in early childhood, although some followed children into early adolescence. Overall, the findings were mixed. Physical punishment predicted increases in internalising behaviour over time in five of the ten independent samples, including all six FFCWS studies.^{24,25,41,42,49,54,56,57,71,72} Three independent studies found no associations.^{35,43,44} One study reported mixed findings from subgroup analyses,³² and another reported beneficial associations from toddlerhood to the preschool years but detrimental associations for physical punishment in the preschool years predicting internalising outcomes in middle childhood.³⁸

Total behaviour problems

Six studies from five independent samples examined total behaviour problems, a combination of internalising and externalising behaviours.⁷⁴⁻⁷⁹ All were conducted with young children, with a baseline age of two to four years and follow-up periods of two to six years. Physical punishment was related to increased behaviour problems over time in four independent samples.^{74,75,77,78} The fifth sample was the NLSY; of the two studies using this dataset, one found that physical punishment predicted more behaviour problems over time⁷⁶ and the other reported mixed findings.⁷⁹

Prosocial behaviour / social competence

None of the five included studies on prosocial behaviour / social competence found any evidence that physical punishment influenced these outcomes.^{42,44,47,62,64}

Inattention and attention-deficit/hyperactivity disorder (ADHD)

Physical punishment was unrelated to later inattention in a sample from the US Head Start Impact study.⁶⁴ However, data from the ECLS-K suggested that physical punishment at five years old increased the risk of both moderate and severe ADHD symptomatology and the risk of severe ADHD-Conduct Disorder symptomatology eight years later.⁸⁰

Cognitive abilities

Cognitive abilities were assessed in eight studies using data from six independent samples.^{22,23,57,64,74,81-83} Outcomes included children's vocabulary, literacy, reading and maths skills, school readiness, school engagement, and approaches to learning. Findings were highly heterogeneous. Two independent studies showed that physical punishment was associated with poorer cognitive abilities in early childhood.^{81,83} Of three analyses of FFCWS data that used the same vocabulary test but at different ages and with different follow-up periods, only one found an

association between physical punishment and lower vocabulary scores,²² whereas the other two studies did not.^{23,57} Three studies reported mixed results with detrimental impacts for some but not all cognitive outcomes.^{64,74,82} One study reported associations with better cognitive performance but weaker school engagement in middle childhood and adolescence.⁸²

Interpersonal Relationships

Cross-lagged path models revealed reciprocal associations between physical punishment and the parent-child relationship: physical punishment at 36 months was associated with poorer observed parent-child interaction quality one and a half years later, and higher interaction quality at 36 months was associated with less physical punishment over time.⁴⁰

Peer isolation among young children (such as having nobody to talk to at school) was assessed in a study using the National Survey of Child and Adolescent Well-Being and was found to be unrelated with physical punishment.⁸²

Data from an evaluation of a US dating violence prevention programme found mixed results, with no overall associations between child-reported physical punishment at age 14 years and self-reported dating violence initiation assessed seven and 19 months later for the subsample of single mothers, but found a detrimental association for physical punishment by married mothers and a non-significant association between physical punishment by married fathers and dating violence.⁸⁴

Stress reactivity

One small US study measured physical punishment at one year of age and children's cortisol production during a lab visit between ages one and two years, after exposure to a stressful situation (introducing a stranger and separating the child from the mother).⁸⁵ A higher frequency of physical punishment at age one predicted higher cortisol levels post separation after controlling for baseline cortisol, indicating a heightened stress response.⁸⁵

Involvement with child protective services

When a family reports they are involved with CPS, such involvement is typically an indication of suspected child maltreatment. Associations between physical punishment in early childhood and subsequent involvement with CPS for suspected child abuse or neglect were assessed in three US studies. We did not require that a study controlled for previous maltreatment or involvement with CPS because we would not expect reciprocal associations between physical punishment and CPS involvement. Additionally, we felt any future maltreatment was of concern, regardless of whether it had happened in the past. In fact, one of the studies did control for previous CPS involvement⁸⁶ while two studies using data from the FFCWS did not^{87,88}. In both samples, physical punishment increased the risk of subsequent CPS involvement^{87,88} and of CPS-reported neglect after controlling for previous CPS involvement.⁸⁶

Thematic Overview

We identified several themes from our review of the longitudinal research on physical punishment and change in children's outcomes over time.

Theme 1—Physical punishment consistently predicts child behaviour problems over time.

It is commonly believed that physical punishment is an effective method to improve child behaviour. However, the overwhelming conclusion from the studies examined here is that physical punishment predicts an increase over time in behaviour problems. This finding is consistent with three past meta-analyses that have found parents' use of physical punishment to be associated with more child behaviour problems, including aggression.^{5,12,14} Therefore, physical punishment is ineffective in achieving parents' goal of improving child behaviour and instead appears to have the opposite effect of increasing unwanted behaviours.

Theme 2—Physical punishment is not associated with positive outcomes over time.

Few studies of outcomes other than behaviour problems met our strict criteria that they examine potential outcomes of physical punishment prospectively while accounting for initial levels of the child outcome. The results were largely mixed between findings of detriments and findings of no association; across these studies, there was no evidence of associations with positive outcomes related to children's attention, cognitive abilities, relationships with others, or stress reactivity. Physical punishment also does not predict improvements in children's prosocial behaviour or social competence over time.

Theme 3—Physical punishment increases the risk of child maltreatment.

Two independent studies, one of which took into account prior involvement with CPS,⁸⁶ found that parents who used physical punishment were at heightened risk of perpetrating maltreatment that would trigger CPS involvement. This finding is consistent with previous meta-analyses that have found physical punishment to be significantly associated with higher risk of maltreatment,^{5,12} and with the finding from a study of Canadian CPS records, not included in our narrative review, that 75% of cases of substantiated physical abuse incidents occur in the context of punishment.⁸⁹ Taken together, these findings indicate that physical punishment is linked with an increased risk of maltreatment. They also call into question the arbitrary distinction between acceptable and non-acceptable violence toward children.

Theme 4—The only evidence of children’s behaviour eliciting physical punishment is for externalising behaviour.

A criticism of past research on physical punishment is that cross-sectional studies cannot determine whether physical punishment causes behaviour problems, in part because observed correlations could reflect reverse causality, namely children’s behaviour problems eliciting physical punishment. We addressed this concern by only including in our review prospective longitudinal studies that included initial levels of a child’s behaviour; doing so allows us to be certain we are examining whether physical punishment predicts a change in children’s behaviour over and above their initial behaviour. In addition, 15 studies in our review used a cross-lagged panel design which simultaneously models both the longitudinal association between physical punishment and child behaviour as well as the association between initial child behaviour and parents’ use of physical punishment at a subsequent wave. In the six studies with independent samples,^{27,33,34,38,40,72} and the nine studies using the FFCWS,^{21,47,49,50,52,53,57,60,61} physical punishment consistently predicted worsening externalising behaviour problems over time, even after accounting for the tendency of externalising behaviour to elicit physical punishment.

In contrast, studies that used cross-lagged models to examine associations between physical punishment and internalising behaviour found no evidence that internalising elicited more physical punishment over time.^{49,57} Similarly, no reciprocal effects were found for children’s social competence⁴⁷ or for children’s vocabulary scores.⁵⁷ The lack of evidence of a child elicitation effect for these outcomes indicates there is little evidence of potential reverse causation for outcomes other than externalising behaviour problems.

Theme 5—Physical punishment is linked with worsening behaviour over time in studies using quasi-experimental methods.

The primary criticism of empirical studies of physical punishment is that they are largely non-experimental and thus cannot rule out other potential explanatory factors.²⁶ Ethics committees would consider the random assignment of children to a physical punishment condition to be unethical, and thus experiments are not feasible. However, several of the studies in our review used methodological designs that help rule out other potential explanations and thereby increase our confidence that the findings are consistent with a causal conclusion.

Three studies created quasi-experimental comparisons through propensity score matching (PSM), which matches children on a range of individual and family background characteristics so that the only observed difference between them is whether they experienced physical punishment. Using PSM with data from the U.S. ECLS study (12,112 families), one study found that children who were physically punished increased their externalising behaviour from age five to eight significantly

more than children who had not been physically punished.²⁶ A second study from Japan (29,182 families) used PSM to determine that children who were physically punished exhibited more behaviour problems over time compared to their peers who were not.⁷⁷ The third study, based in Colombia (1,167 families), found that young children who were physically punished gained fewer cognitive skills than children who were not physically punished.⁸¹ The fact that these studies using rigorous statistical methods with large samples from three different countries all found that physical punishment predicted poorer outcomes over time lends considerable credence to the conclusion that physical punishment is harmful to children's development.

A second method of ruling out alternative explanations is fixed effects regression, which uses difference scores for both predictor and outcome to control for time invariant unobserved characteristics that may account for associations between physical punishment and child outcomes. Two studies in our review used this method. One used the NLSY to find that increases in physical punishment predicted increases in children's externalising behaviours.³⁵ The other study used fixed effects regressions with the FFCWS and found that physical punishment predicted increases in child aggressive behaviour.⁵⁵

Finally, two studies in our review used data from randomised controlled trials of interventions that reduced physical punishment; although the physical punishment was not randomly assigned, the experimentally induced reductions in physical punishment predicted improvements in children's problem behaviours over time.^{36,64}

Theme 6—The associations of physical punishment with increases in detrimental child outcomes are robust across child and parent characteristics.

Many of the studies in our review considered whether the associations between physical punishment and child outcomes might vary by characteristics of the child or parent. We highlight here the findings for the most commonly considered modifiers.

Sex of the child. Studies with four independent samples in the USA found no modification of the link between physical punishment and increased behaviour problems.^{21,23,30,65} Two U.S. studies found a stronger association with problem behaviours for boys than girls,^{59,68} whereas a Chinese study reported an association with externalising behaviours for girls but not boys.³¹ A study in Canada found no modification by child sex for the outcome of child aggression or conduct problems, but did find physical punishment to be linked with improved prosocial behaviour but only for girls.⁶² In a national study in Greece, physical punishment predicted more externalising behaviours for boys but fewer externalising or internalising behaviours for girls.³² The majority of these studies thus found physical punishment to be linked with increased problem behaviour for both boys and girls, only with differences in the strength of the association.

Race/ethnicity. Previous research has argued that the impacts of physical punishment may vary based on the acceptance of physical punishment by the family's culture, an argument referred to as cultural normativeness theory.⁹⁰ Several of the studies we reviewed accordingly tested for effect modification by a family's race/ethnicity. However, no modification of the link to increased externalising behaviour was found in the ECLSK,^{27,80} the FFCWS,^{21,60} or five other independent samples.^{30,38,41,45,72} Findings with the NLSY for child behaviour problems were mixed, with some finding modification by race/ethnicity^{70,79} but others finding no modification.^{67,68,76} Another study with the NLSY found no modification by race/ethnicity for math or reading achievement.⁸³ Three studies did find modification, but not in the direction predicted by cultural normativeness theory.^{38,39,84} Overall, these USA-based studies provided no support for the notion that the associations of physical punishment with child outcomes are modified by the race or ethnicity of the child.

Parenting style. Some have argued that any negative impacts of physical punishment are buffered when parents have an overall positive parenting style. One study using the NLSY did find evidence of a buffering effect of responsiveness on the link between physical punishment and behaviour problems,⁷⁶ but another study with the NLSY found neither responsiveness nor cognitive stimulation buffered the links between physical punishment and worse reading and math achievement.⁸³ Three other studies found that parental warmth did not buffer the impact of physical punishment on an increase in behaviour problems.^{50,65,72} There is thus little evidence that parenting style modifies the associations between physical punishment and detrimental child outcomes.

Theme 7—Physical punishment shows a dose-response relationship with some child outcomes.

Seven studies measured the relationship between frequency of physical punishment and level of the outcome variable. Five of these studies found evidence of a dose-response effect; that is, the magnitude of the effect varied with the frequency of the punishment. Three studies using the FFCWS found that the association with child aggression became stronger as the frequency of physical punishment increased.^{23,51,54} Two studies used the NLSY, one of which did not find a dose-response effect for antisocial behaviour (both one instance and two or more instances of physical punishment predicted antisocial behaviour).⁶⁷ The other study found that the association with lower math and reading achievement became stronger as the frequency of physical punishment increased.⁸³ Such findings of dose-response associations between physical punishment and increases in detrimental child outcomes over time are indicative of a causal relationship per Hill's criteria for establishing causality.^{17,91}

Limitations

The purpose of this narrative review was to summarise and interpret the extant research on physical punishment from prospective studies. Because it is not a meta-analysis or systematic review, this

narrative review does not take into account the number of participants in a study or the magnitude of effect sizes. The vast majority of studies that met our selection criteria were conducted in the U.S.; only eight studies in this review were from other countries (one each from Canada,⁶² China,³¹ Colombia,⁸¹ Greece,³² Japan,⁷⁷ Switzerland,⁶³ Turkey,³³ and the UK;⁷⁸ see Appendix Table A2). More research is needed in countries outside the U.S., and in low- and middle-income countries in particular.

Implications for Policy

The evidence is consistent and robust: physical punishment does not predict improvements in child behaviour and instead predicts deterioration in child behaviour and increased risk for maltreatment. There is thus no empirical reason for parents to continue to use physical punishment. Moreover, the UN Committee on the Rights of the Child has explicitly stated that physical punishment is a violation of children's right to protection and should be prohibited.²

So far, 61 of the world's countries have prohibited all physical punishment of children, thereby ensuring that their laws protect children and adults equally. These prohibitions are found throughout the world – ten in Africa, ten in Central and South America, five in Asia/Pacific, 35 in Europe, and one in the Middle East.¹⁰ They are found across the world's cultures, faiths, levels of economic development, political leanings, and legal systems. Most recently, two constituent countries of the United Kingdom – Scotland and Wales – also passed laws prohibiting all physical punishment of children.

Evidence is growing that such laws are associated with rapid and dramatic changes in parents' attitudes and behaviour, reducing both approval and prevalence of physical punishment of children.⁹² Sweden, which prohibited all physical punishment of children in 1979, provides an example of how a prohibition can lead to steady declines in physical punishment over time. In a study of three cohorts of young- to middle-aged adults, the proportion of participants who reported being slapped during childhood decreased from 83% in 1958, to 51% in 1981, and then to 27% in 2011 – a two thirds reduction over 53 years.⁹³ While public education can help to increase knowledge and shift attitudes, those efforts are slowed and undermined when the law contradicts them. A study of five European countries found that the greatest changes in attitudes about and use of physical punishment are found when public education and law are consistent.^{94,95}

There is no evidence that laws giving children full protection create an influx of caregivers into the justice system. Five years of police monitoring following the implementation of New Zealand's prohibition found that prosecution was limited to severe acts (e.g., kicking, holding by the neck, causing injuries) and none led to prison sentences. After passage of the legal prohibition on physical punishment, police worked more closely with the child protection authority, diverting cases

from the justice system to agencies that could respond supportively.⁹⁶ Indeed, in virtually all countries with prohibitions, these laws serve an educational, rather than punitive function, aiming to increase awareness, shift attitudes, and clarify the responsibilities of parents in their caregiving role.⁹²

In addition to national legal bans, communities and institutions can assist in preventing and reducing physical punishment. One example are No Hit Zones, which have been successfully introduced in many locations in the U.S., particularly hospitals. No Hit Zones prohibit the hitting of children in those settings and are effective in increasing both hospital staff's willingness to intervene in situations of parent-child hitting and parents' acceptance of staff advice to avoid physical punishment.⁹⁷ No Hit Zones are low-cost interventions that can be instituted widely across communities and in a variety of settings (e.g., schools, libraries, supermarkets). A second strategy is for governments, stakeholders, and practitioners to prioritise educational campaigns and interventions that teach parents and caregivers disciplinary strategies that focus on enhancing children's understanding rather than enforcing their compliance, and that are based on children's rights to protection and dignity.⁹⁸⁻¹⁰⁰

Conclusions

This up-to-date, comprehensive, and detailed review of prospective longitudinal studies has shown that physical punishment is linked with increases in negative child outcomes. Many of these studies used statistical methods to minimise potential confounding and selection bias. The review has documented compelling evidence that physical punishment is harmful to children's development and wellbeing and has revealed no evidence that it is beneficial for children. Given the high prevalence of physical punishment around the world, there is no time to waste – all countries should heed the UN's call to uphold children's human rights and promote their wellbeing by prohibiting physical punishment in all forms and all settings.

Contributors

AH, RGW, and YK conceived of the study; all authors contributed to its design. AH and AM searched the literature, selected papers for inclusion in the review, and extracted the data. AH, AM, RGW, and EG interpreted the results and drafted the report. All authors commented on and revised the report and approved the final version.

Declaration of interests

The authors declare no competing interests.

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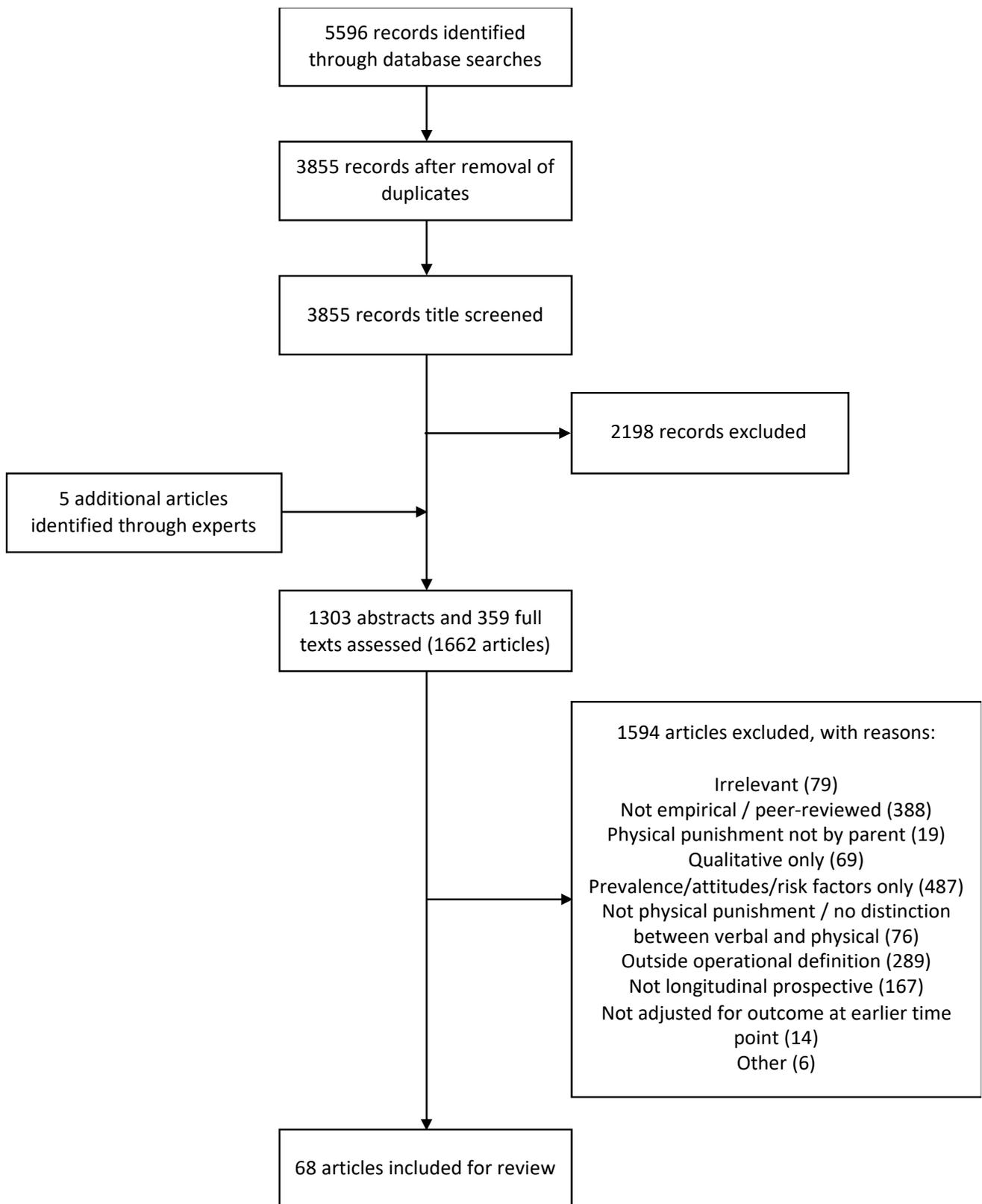


Figure 1: Study selection

Table 1: Overview of included studies, by child outcome

	Number of studies examining that outcome	Number of independent samples examining that outcome	Among the independent samples			
			Detrimental outcomes	Beneficial outcomes	No significant associations	Mixed findings
Externalising behaviours						
Externalising behaviour	27	19	13	0	3	3 [det/ns] ^{31,46} [det/ben] ³²
Aggressive behaviour	20	6	5	0	1	0
Antisocial behaviour / conduct problems	8	5	4	0	0	1 [det] ^{67,68} [ns] ^{69,70}
Internalising behaviours						
Internalising behaviours	15	10	5	0	3	2 [ben/ns] ³² [det/ben] ³⁸
Total behaviour problems (externalising & internalising)	6	5	4	0	0	1 [det] ⁷⁶ [det/ns/ns] ⁷⁹
Prosocial behaviour / social competence	5	5	0	0	5	0
Inattention / ADHD symptoms	2	2	1	0	1	0
Cognitive abilities	8	6	2	0	1	3 [det/ns/ns] ^{64,74} [det/ben] ⁸²
Interpersonal relationships	3	3	1	0	1	1 [det/ns/ns] ⁸⁴
Stress reactivity	1	1	1	0	0	0
Involvement with CPS ^a	3	2	2	0	0	0
Totals:	98	64	38	0	15	11

Note: det = detrimental; ben = beneficial; ns = not significant. Mixed findings = differential findings across measures or subgroups within the same study or across studies within the same dataset.

^a Only one of the independent samples examining child abuse or neglect controlled for previous maltreatment.

Appendix Table A1: Search syntax by database

Database	Search terms and filters
Pubmed/Medline	<p>Search: physical discipline [tw] OR physical punishment [tw] OR corporal punishment [tw] OR physical chastisement [tw] OR smack* [tw] OR spank* [tw] OR slap* [tw]</p> <p>Filters: tw (Title, Abstract, MeSH headings and Subheadings (includes single words and phrases), Other Terms field (which includes author-supplied keywords)); 2002>onwards; Journal Article; Humans.</p>
PsychInfo	<p>Search: in title or abstract: "physical discipline" OR "physical punishment" OR "corporal punishment" OR "physical chastisement" OR smack* OR spank* OR slap*</p> <p>Filters: 2002-current; human</p>
Web of Science	<p>Topic search: "physical discipline" OR "physical punishment" OR "corporal punishment" OR "physical chastisement" OR smack* OR spank* OR slap*</p> <p>Filters: 2002>onwards; document types: article OR review; excluding proceedings paper OR book chapter OR retracted publication OR data paper; excluding Web of Science categories: (chemistry analytical or engineering civil or biotechnology applied microbiology or computer science artificial intelligence or geology or optics or spectroscopy or film radio television or water resources or veterinary sciences or agriculture dairy animal science or marine freshwater biology or chemistry physical or energy fuels or computer science information systems or engineering mechanical or engineering biomedical or food science technology or nanoscience nanotechnology or physics applied or geosciences multidisciplinary or engineering multidisciplinary or history or materials science multidisciplinary or language linguistics or telecommunications or literature or zoology or anthropology or medieval renaissance studies or parasitology or geochemistry geophysics or chemistry multidisciplinary or plant sciences or engineering electrical electronic or engineering chemical or audiology speech language pathology or mechanics or linguistics or automation control systems or biophysics or computer science interdisciplinary applications or acoustics or physics particles fields or orthopedics or archaeology or sport sciences or business or evolutionary biology or surgery or hematology or hospitality leisure sport tourism or management or music or physics multidisciplinary or art or microbiology or obstetrics gynecology or literary theory criticism or public administration or pharmacology pharmacy or chemistry medicinal or chemistry organic or classics or physics nuclear or geography or astronomy astrophysics or economics or infectious diseases or international relations or literature romance or theater or mathematics applied or meteorology atmospheric sciences or regional urban planning)</p>

Appendix Table A2: Characteristics of included studies, grouped by outcome

Author/ year	Country	Dataset / study population	Sample size	Analysis method	Outcome(s) as described by authors	Follow up period	Findings (main effect)	Comments
Externalising behaviour problems								
Akcinar and Baydar 2016 ³³	Turkey	Early Childhood Developmental Ecologies in Turkey Study	1,009	Cross-lagged path analysis	Externalising behaviour	4 years; age at baseline 36-47 months; 4 time points	Detrimental	Reciprocal associations
Bakoula et al. 2009 ³²	Greece	Greek Birth Cohort	2065	Regression models	Externalising behaviour	11 years; age at baseline 7 years	No main effect; Mixed: detrimental for boys / beneficial for girls	Moderation by sex
Barajas-Gonzalez et al. 2018 ⁴³	USA	Mexican and Dominican American immigrant families	633	Regression models	Externalising behaviour	1 year; age at baseline 4 years	No associations	
Barnes et al. 2013 ³⁴	USA	Early Childhood Longitudinal Study, Birth Cohort	750	Cross-lagged path analysis	Externalising behaviour	1-2 years; age at baseline 4 years	Detrimental	Reciprocal effects
Baumrind, Larzelere and Owens 2012 ⁴⁴	USA	Baumrind's Family Socialization Project	87	MANCOVA; regression models	Externalising behaviour	10 years, mean age at baseline 5 years	No associations	
Beauchaine et al 2005 ³⁶	USA	Children with oppositional defiant disorder / conduct disorder who took part in interventional studies	514	Latent growth curve models	Externalising behaviour	1 year; age at baseline 3-8 years	Detrimental	Experimental data from RCTs
Callender et al. 2012 ³⁷	USA	Children at risk for school age conduct problems	245	Structural equation models	Externalising behaviour	2-3 years; age at baseline 3 years	Detrimental	
Coley, Kull and Carrano 2014 ³⁸	USA	Three City Study - low-income urban African American and Hispanic families	592	Cross-lagged path analysis	Externalising behaviour	6 years; age at baseline 3 years; 3 time points	Detrimental	No reciprocal effects; no moderation by race/ethnicity
Gershoff et al. 2012 ²⁷	USA	Early Childhood Longitudinal Study – Kindergarten Cohort	10 044	Cross-lagged path analysis	Externalising behaviour	3 years; age at baseline 5 years	Detrimental	Not moderated by race/ethnicity; reciprocal effects

Author/ year	Country	Dataset / study population	Sample size	Analysis method	Outcome(s) as described by authors	Follow up period	Findings (main effect)	Comments
Gershoff, Sattler and Ansari 2018 ²⁶	USA	Early Childhood Longitudinal Study – Kindergarten Cohort	12 112	Propensity score matching	Externalising behaviour	3 years; age at baseline 5 years	Detrimental	
Gibson and Fagan 2018 ³⁹	USA	Longitudinal Study of Child Abuse and Neglect	1075	Multilevel growth models	Externalising behaviour	12 years; age at baseline 4-8 years	Detrimental	Moderation by race/ethnicity
Grogan-Kaylor 2005a ³⁵	USA	National Longitudinal Survey of Youth	1943	Fixed effects models	Externalising behaviour	6 years; age 4-14 years; 4 time points	Detrimental	Not moderated by neighbourhood quality
Laible et al. 2020 ⁴⁰	USA	National Institute of Child Health and Human Development Study of Early Child Care and Youth Development	1364	Cross-lagged path analysis	Externalising behaviour	5 years; age at baseline 3 years; 4 time points	Detrimental	
Lansford et al. 2009 ³⁰	USA	Study 1: Child Development Project	Study 1: 499	Modelling of trajectory groups, ANCOVA	Externalising behaviour	Study 1: 13 years (age 5-16)	Study 1: Detrimental	Not moderated by sex or race/ethnicity
Lansford et al. 2009 ³⁰	USA	Study 2: Pitt Mother-Child Project	Study 2: 258	Modelling of trajectory groups, ANCOVA	Externalising behaviour	Study 2: 5 years (age 10-15)	Study 2: Detrimental	Not moderated by sex or race/ethnicity
Lansford et al. 2012a ²⁸	USA	Child Development Project	585	Structural equation models	Externalising behaviour	4 years; age at baseline 5 years	Detrimental	Moderation by race/ethnicity
Lansford et al. 2012b ²⁹	USA	Child Development Project	585	ANCOVA and cross-lagged path analysis	Externalising behaviour	2 years; age at baseline 6 years; 3 time points	No associations	
MacKenzie et al. 2012 ²²	USA	Fragile Families and Child Wellbeing Study	1110	Regression models	Externalising behaviour	2 years; age at baseline 3 years	Detrimental	
MacKenzie et al. 2013 ²³	USA	Fragile Families and Child Wellbeing Study	1933	Regression models	Externalising behaviour	6 years; age at baseline 3 years	Detrimental	Not moderated by sex or race/ethnicity; dose-response
MacKenzie et al. 2015 ²¹	USA	Fragile Families and Child Wellbeing Study	1874	Cross-lagged path analysis	Externalising behaviour	8 years; age at baseline 1 year; 4 time points	Detrimental	Not moderated by sex or race/ethnicity; reciprocal effects

Author/ year	Country	Dataset / study population	Sample size	Analysis method	Outcome(s) as described by authors	Follow up period	Findings (main effect)	Comments
Mendez et al. 2016 ⁴⁶	USA	Family Transition project	218	Regression models	Externalising behaviour	1 year; age at baseline 2 years	Mixed: detrimental / no association	Fathers' (not mothers') punishment associated with later externalising
Mulvaney and Mebert 2007 ⁴¹	USA	National Institute of Child Health and Human Development Study of Early Child Care and Youth Development	1028	Regression models	Externalising behaviour	6 years; age at baseline 15 months; 4 time points	Detrimental	Not moderated by race/ethnicity
O'Gara et al. 2020 ⁴⁵	USA	Latinos in Context Study	141	Multigroup cross-lagged path analysis	Externalising behaviour	2 years; age at baseline 4 years; 3 time points	No associations	Not moderated by race/ethnicity
Petts and Kysar-Moon 2012 ²⁵	USA	Fragile Families and Child Wellbeing Study	1214	Regression models	Externalising behaviour	2 years; age at baseline 3 years	Detrimental	Moderation by religious affiliation
Xing et al. 2011 ³¹	China	Sample of Chinese elementary school-aged children	454	Structural equation models	Externalising behaviour	6 months; mean age at baseline 10 years	Mixed: detrimental for girls / no association for boys	Moderation by sex
Yoo and Huang 2013 ²⁴	USA	Fragile Families and Child Wellbeing Study	1234	Structural equation models	Externalising behaviour	5 years; followed from birth; 4 time points	Detrimental	
Yu et al. 2018 ⁴²	USA	Sample of Chinese Americans	163	Bayesian path analysis	Externalising behaviour	6 months; age at baseline 3-5 years	Detrimental	Moderation by acculturation
Aggressive behaviour								
Altschul, Lee and Gershoff 2016 ⁴⁷	USA	Fragile Families and Child Wellbeing Study	3279	Cross-lagged path analysis	Aggressive behaviour	2 years; age at baseline 3 years	Detrimental	Reciprocal effects
Gershoff et al. 2016 ⁶⁴	USA	Head Start Impact Study	2063	Cross-lagged path analysis	Aggressive behaviour	1.5 years; age at baseline 3 years; 3 time points	Detrimental	
Grogan-Kaylor et al. 2020 ⁴⁸	USA	Fragile Families and Child Wellbeing Study	2703	Bayesian regression methods	Aggressive behaviour	2 years; age at baseline 3 years	Detrimental	Not moderated by neighbourhood disadvantage
Gromoske and Maguire-Jack 2012 ⁴⁹	USA	Fragile Families and Child Wellbeing Study	3870	Cross-lagged path analysis	Aggressive behaviour	4 years; age at baseline 1 year; 3 time points	Detrimental	Reciprocal effects

Author/ year	Country	Dataset / study population	Sample size	Analysis method	Outcome(s) as described by authors	Follow up period	Findings (main effect)	Comments
Lee, Altschul and Gershoff 2013 ⁵⁰	USA	Fragile Families and Child Wellbeing Study	3279	Cross-lagged path analysis	Aggressive behaviour	4 years; age at baseline 1 year; 3 time points	Detrimental	Not moderated by maternal warmth; reciprocal effects
Lee et al. 2013 ⁵¹	USA	Fragile Families and Child Wellbeing Study	923	Regression models	Aggressive behaviour	2 years; age at baseline 3 years	Detrimental	Dose-response
Lee, Altschul, and Gershoff 2015 ⁵²	USA	Fragile Families and Child Wellbeing Study	1298	Cross-lagged path analysis	Aggressive behaviour	2 years; age at baseline 3 years	Detrimental	Reciprocal effects for mothers; NS for fathers
Lee et al. 2020 ⁵³	USA	Fragile Families and Child Wellbeing Study	4149	Cross-lagged path analysis	Aggressive behaviour	9 years; age at baseline 1 year	Detrimental	Moderation by household income; reciprocal effects
Ma and Grogan-Kaylor 2017 ⁵⁴	USA	Fragile Families and Child Wellbeing Study	3705	Hierarchical linear models	Aggressive behaviour	2 years; age at baseline 3 years	Detrimental	Dose-response
Ma, Grogan-Kaylor and Lee 2018 ⁵⁵	USA	Fragile Families and Child Wellbeing Study	2472	Fixed effects models	Aggressive behaviour	2 years; age at baseline 3 years	Detrimental	
Ma, Grogan-Kaylor and Lee 2020 ⁵⁶	USA	Fragile Families and Child Wellbeing Study	2472	Fixed effects models	Aggressive behaviour	2 years; age at baseline 3 years	Detrimental	Not moderated by community violence
Maguire-Jack, Gromoske and Berger 2012 ⁵⁷	USA	Fragile Families and Child Wellbeing Study	3870	Cross-lagged path analysis	Aggressive behaviour	4 years; age at baseline 1 year; 3 time points	Detrimental	Reciprocal effects
Neaverson et al. 2020 ⁵³	Switzerland	Zurich Project on the Social Development from Childhood to Adulthood	1447	Cross-lagged path analysis	Aggressive behaviour	2 years; age at baseline 11 years; 3 time points	Detrimental	
Olson et al. 2011 ⁶⁵	USA	Children at risk of school-age conduct problems	199	Regression models	Peer aggression	3 years; age at baseline 3 years	Detrimental	Not moderated by child sex or parental warmth
Piche et al. 2017 ⁶²	Canada	Quebec Longitudinal Study of Child Development	1686	Regression models	Physical aggression	2 years; age at baseline 3 years	Detrimental	Not moderated by child temperament
Stacks et al. 2009 ⁶⁶	USA	Early Head Start Research and Evaluation Study	3001	Regression models	Aggressive behaviour	2 years; age at baseline 1 year; 3 time points	No associations	

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Taylor et al. 2010 ⁵⁸	USA	Fragile Families and Child Wellbeing Study	2461	Regression models	Aggressive behaviour	2 years; age at baseline 3 years	Detrimental	
Turns and Sibley 2018 ⁵⁹	USA	Fragile Families and Child Wellbeing Study	1020	Cross-lagged path analysis	Bullying behaviour	8 years; age at baseline 1 year; 4 time points	No main effect; Mixed: detrimental for boys /beneficial for girls (age 1 to 3 only; age 3 to 5 no association)	Moderation by child sex
Ward et al. 2019 ⁶⁰	USA	Fragile Families and Child Wellbeing Study	3632	Cross-lagged path analysis	Aggressive behaviour	4 years; age at baseline 1 year; 3 time points	Detrimental	Not moderated by race/ethnicity; reciprocal effects
Ward et al. 2020 ⁶¹	USA	Fragile Families and Child Wellbeing Study	2211	Cross-lagged path analysis	Aggressive behaviour	4 years; age at baseline 1 year; 3 time points	Detrimental	Moderation by maternal attachment; reciprocal effects
Antisocial behaviour / conduct problems								
Derella et al. 2020 ⁷³	USA	Pittsburgh Girls Study	2450	Regression models with lagged predictors	Oppositional Defiant Disorder	12 years; age at baseline 5-8 years	Detrimental	
Ellison, Musick and Holden 2011 ⁷¹	USA	National Survey of Families and Households	456	Regression models	Antisocial behaviour	5 years; age at baseline 2-4 years	Detrimental	Moderation by religious affiliation
Grogan-Kaylor 2004 ⁶⁷	USA	National Longitudinal Survey of Youth	1811	Fixed effects models	Antisocial behaviour	4 years; mean age 10 years	Detrimental	Not moderated by race/ethnicity; no dose-response
Grogan-Kaylor 2005b ⁶⁸	USA	National Longitudinal Survey of Youth	6912	Hierarchical linear models	Antisocial behaviour	10 years; age at baseline 4 years	Detrimental	Not moderated by race/ethnicity; moderation by child age and sex
Lahey et al. 2008 ⁷⁰	USA	National Longitudinal Survey of Youth	1,863	GEE models	Conduct problems	10 years (age 4 to 14)	No associations	Moderation by race/ethnicity
Larzelere, Cox and Smith 2010 ⁶⁹	USA	National Longitudinal Survey of Youth	785	Regression and structural equation models	Antisocial behaviour	2 years; age at baseline 6-9 years	No associations	
Piche et al. 2017 ⁶²	Canada	Quebec Longitudinal Study of Child Development	1686	Regression models	Conduct problems	2 years; age at baseline 3 years	Detrimental	Not moderated by child temperament

Author/ year	Country	Dataset / study population	Sample size	Analysis method	Outcome(s) as described by authors	Follow up period	Findings (main effect)	Comments
Wang and Kenny 2014 ⁷²	USA	Longitudinal Study of Youth Development	862	Cross-lagged path analysis	Conduct problems	4 years; age at baseline 12 years; 3 time points	Detrimental	Not moderated by race/ethnicity or parental warmth; reciprocal effects
Internalising behaviour								
Bakoula et al. 2009 ³²	Greece	Greek Birth Cohort	2065	Regression models	Internalising behaviour	11 years; age at baseline 7 years	Mixed: beneficial for girls / no association for boys	Moderation by child sex
Barajas-Gonzalez et al. 2018 ⁴³	USA	Mexican and Dominican American immigrant families	633	Regression models	Internalising behaviour	1 year; age at baseline 4 years	No associations	
Baumrind, Larzelere and Owens 2010 ⁴⁴	USA	Baumrind's Family Socialization Project	87	MANCOVA; regression models	Internalising behaviour	10 years, mean age at baseline 5 years	No associations	
Coley, Kull and Carrano 2014 ³⁸	USA	Three City Study - low-income urban African American and Hispanic families	592	Cross-lagged path analysis	Internalising behaviour	6 years; age at baseline 3 years; 3 time points	Mixed: beneficial wave 1 to wave 2 / detrimental wave 2 to wave 3	Moderation by race/ethnicity; no reciprocal effects
Ellison, Musick and Holden 2011 ⁷¹	USA	National Survey of Families and Households	456	Regression models	Internalising behaviour	5 years; age at baseline 2-4 years	Detrimental	
Grogan-Kaylor 2005a ³⁵	USA	National Longitudinal Survey of Youth	1943	Fixed effects models	Internalising behaviour	6 years; age 4-14 years; 4 time points	No associations	
Gromoske and Maguire-Jack 2012 ⁴⁹	USA	Fragile Families and Child Wellbeing Study	3870	Cross-lagged path analysis	Internalising behaviour	4 years; age at baseline 1 year; 3 time points	Detrimental	No reciprocal effects
Ma and Grogan-Kaylor 2017 ⁵⁴	USA	Fragile Families and Child Wellbeing Study	3705	Hierarchical linear models	Internalising behaviour	2 years; age at baseline 3 years	Detrimental	
Ma, Grogan-Kaylor and Lee 2020 ⁵⁶	USA	Fragile Families and Child Wellbeing Study	2472	Fixed effects models	Internalising behaviour	2 years; age at baseline 3 years	Detrimental	Not moderated by community violence
Maguire-Jack, Gromoske and Berger 2012 ⁵⁷	USA	Fragile Families and Child Wellbeing Study	3870	Cross-lagged path analysis	Internalising behaviour	4 years; age at baseline 1 year; 3 time points	Detrimental	No reciprocal effects

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Mulvaney and Mebert 2007 ⁴¹	USA	National Institute of Child Health and Human Development Study of Early Child Care and Youth Development	1028	Regression models	Internalising behaviour	6 years; age at baseline 15 months; 4 time points	Detrimental	Not moderated by race/ethnicity
Petts and Kysar-Moon 2012 ²⁵	USA	Fragile Families and Child Wellbeing Study	1214	Regression models	Internalising behaviour	2 years; age at baseline 3 years	Detrimental	Not moderated by religious affiliation
Wang and Kenny 2014 ⁷²	USA	Longitudinal Study of Youth Development	862	Cross-lagged path analysis	Depressive symptoms	4 years; age at baseline 12 years; 3 time points	Detrimental	Not moderated by race/ethnicity or parental warmth; no reciprocal effects
Yoo and Huang 2013 ²⁴	USA	Fragile Families and Child Wellbeing Study	1234	Structural equation models	Internalising behaviour	5 years; followed from birth; 4 time points	Detrimental	
Yu et al. 2018 ⁴²	USA	Sample of Chinese Americans	163	Bayesian path analysis	Internalising behaviour	6 months; age at baseline 3-5 years	Detrimental	
Total behaviour problems (combined externalising and internalising)								
Ansari and Gershoff 2016 ⁷⁴	USA	Family and Child Experiences Survey, 2006 cohort	1020	Structural equation models	Behaviour problems	2 years; age at baseline 41 months; 3 time points	Detrimental	
Keyser, Ahn and Unick 2017 ⁷⁵	USA	Fragile Families and Child Wellbeing Study	4898	Growth curve models	Problem behaviour	6 years; age at baseline 3 years; 3 time points	Detrimental	
McLoyd and Smith 2002 ⁷⁶	USA	National Longitudinal Survey of Youth	1990	Growth curve models	Behaviour problems	6 years; age at baseline 4-5 years; 4 time points	Detrimental	Moderation by maternal emotional support; no moderation by race/ethnicity
Okuzono et al. 2017 ⁷⁷	Japan	Longitudinal Survey of Newborns in the 21 st Century	29 182	Propensity Score Matching	Behaviour problems	2 years; age at baseline 3.5 years	Detrimental	Dose-response
Scott et al. 2014 ⁷⁸	UK	Growing Up in Scotland Study	1600	Regression models	Emotional and behavioural problems	2 years; age at baseline 2 years	Detrimental	
Slade and Wissow 2004 ⁷⁹	USA	National Longitudinal Survey of Youth	1966	Probit models	Behaviour problems	4 years; age at baseline 0-23 months	No main effect; Mixed: detrimental / no association for Hispanic or African American children	Moderation by race/ethnicity

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Prosocial behaviour / social competence								
Altschul, Lee and Gershoff 2016 ⁴⁷	USA	Fragile Families and Child Wellbeing Study	3279	Cross-lagged path analysis	Child social competence	2 years; age at baseline 3 years	No associations	No reciprocal effects
Baumrind, Larzelere and Owens 2010 ⁴⁴	USA	Baumrind's Family Socialization Project	87	MANCOVA; regression models	Adolescent competence	10 years, mean age at baseline 5 years	No associations	
Gershoff et al. 2016 ⁶⁴	USA	Head Start Impact Study	2063	Cross-lagged path analysis	Social skills	1.5 years; age at baseline 3 years; 3 time points	No associations	
Piche et al. 2017 ⁶²	Canada	Quebec Longitudinal Study of Child Development	1686	Regression models	Prosocial behaviour	2 years; age at baseline 3 years	No associations	Moderation by sex
Yu et al. 2018 ⁴²	USA	Sample of Chinese Americans	163	Bayesian path analysis	Prosocial behaviour	6 months; age at baseline 3-5 years	No associations	
Inattention / ADHD symptoms								
Gershoff et al. 2016 ⁶⁴	USA	Head Start Impact Study	2063	Cross-lagged path analysis	Inattention	1.5 years; age at baseline 3 years; 3 time points	No associations	
Morgan et al. 2016 ⁸⁰	USA	Early Childhood Longitudinal Study – Kindergarten Cohort	7456	Regression models	ADHD / ADHD-CD symptoms	8 years; age at baseline 5 years	Detrimental	Not moderated by race/ethnicity
Cognitive abilities								
Ansari and Gershoff 2016 ⁷⁴	USA	Family and Child Experiences Survey, 2006 cohort	1020	Structural equation models	Approaches to learning; literacy skills; maths skills	2 years; age at baseline 41 months; 3 time points	Mixed: detrimental for approaches to learning; no associations for literacy/maths	
Cuartas et al. 2020 ⁸¹	Colombia	Sample of low income Colombian children living in 95 municipalities; data from an RCT	1167	lagged-dependent variables; difference-in-differences-like approach (DD); DD-like approach with matching	Cognitive skills	2 years; age at baseline 1.5 years	Detrimental	

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Font and Cage 2018 ⁸²	USA	CPS-involved children from National Survey of Child and Adolescent Well-Being	658	Mixed-effects linear models	School engagement; cognitive performance	3 years; age at baseline 8-14 years; 3 time points	Mixed: detrimental for school engagement; beneficial for cognitive performance	
Gershoff et al. 2016 ⁶⁴	USA	Head Start Impact Study	2063	Cross-lagged path analysis	Literacy skills (receptive vocabulary, letter-word identification, and spelling)	1.5 years; age at baseline 3 years; 3 time points	Mixed: detrimental for receptive vocabulary only; NS for letter-word; NS for spelling	
MacKenzie et al. 2012 ²²	USA	Fragile Families and Child Wellbeing Study	779	Regression models	Receptive vocabulary	2 years; age at baseline 3 years	Detrimental	
MacKenzie et al. 2013 ²³	USA	Fragile Families and Child Wellbeing Study	1933	Regression models	Receptive vocabulary	6 years; age at baseline 3 years	No associations	
Maguire-Jack, Gromoske and Berger 2012 ⁵⁷	USA	Fragile Families and Child Wellbeing Study	3870	Cross-lagged path analysis	Cognitive skills via vocabulary test	4 years; age at baseline 1 year; 3 time points	No associations	No reciprocal effects
Straus and Paschall 2009 ⁸³	USA	National Longitudinal Survey of Youth	806	ANCOVA, regression models	Maths and reading achievement tests	4 years; age at baseline 2-4 years and 5-9 years	Detrimental	Not moderated by race/ethnicity, maternal supportiveness, maternal cognitive stimulation; dose-response
Interpersonal relationships								
Font and Cage 2018 ⁸²	USA	CPS-involved children from National Survey of Child and Adolescent Well-Being	658	Mixed-effects linear models	Peer isolation	3 years; age at baseline 8-14 years; 3 time points	No associations	
Laible et al. 2020 ⁴⁰	USA	National Institute of Child Health and Human Development Study of Early Child Care	1364	Cross-lagged path analysis	Quality of parent-child interactions	5 years; age at baseline 3 years; 4 time points	Detrimental	Reciprocal effects
Foshee et al. 2005 ⁸⁴	USA	Evaluation of "Safe Dates" violence prevention programme	1218	Regression models	Dating violence	1.5 years; age at baseline 14 years	NS for single mothers; detrimental for married mothers, NS for married fathers	Moderated by maternal education and race/ethnicity

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Stress reactivity								
Bugental, Martorell and Barraza 2003 ⁸⁵	USA	Low-income mothers at risk of future child maltreatment	44	Regression models	Children's cortisol production after exposure to the Strange Situation test	< 1 year; age at baseline 1 year	Detrimental	
Involvement with child protective services								
Lee, Grogan-Kaylor and Berger 2014 ⁸⁷	USA	Fragile Families and Child Wellbeing Study	2788	Regression models	Child Protective Services (CPS) involvement between age 1 and 5 years	4 years; age at baseline 1 year	Detrimental	
Ma, Grogan-Kaylor and Klein 2018 ⁸⁸	USA	Fragile Families and Child Wellbeing Study	2267	Regression models	Child Protective Services (CPS) involvement between age 3 and 5 years	2 years; age at baseline 3 years	Detrimental	
Slack et al. 2004 ⁸⁶	USA	Illinois Family Study	583	Discrete time event history analysis	Physical neglect via Child Protective Services reports	1 year; age at baseline 3 years	Detrimental	Controlled for prior involvement with child protective services