JAMA | US Preventive Services Task Force | EVIDENCE REPORT

Primary Care Interventions to Prevent Child Maltreatment
Evidence Report and Systematic Review for the US Preventive Services Task Force

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IMPORTANCE Child maltreatment is associated with serious negative physical, psychological, and behavioral consequences.

OBJECTIVE To review the evidence on primary care–feasible or referable interventions to prevent child maltreatment to inform the US Preventive Services Task Force.

DATA SOURCES PubMed, Cochrane Library, and trial registries through February 2, 2023; references, experts, and surveillance through December 6, 2023.

STUDY SELECTION English-language, randomized clinical trials of youth through age 18 years (or their caregivers) with no known exposure or signs or symptoms of current or past maltreatment.

DATA EXTRACTION AND SYNTHESIS Two reviewers assessed titles/abstracts, full-text articles, and study quality, and extracted data; when at least 3 similar studies were available, meta-analyses were conducted.

MAIN OUTCOMES AND MEASURES Directly measured reports of child abuse or neglect (reports to Child Protective Services or removal of the child from the home); proxy measures of abuse or neglect (injury, visits to the emergency department, hospitalization); behavioral, developmental, emotional, mental, or physical health and well-being; mortality; harms.

RESULTS Twenty-five trials (N = 14 355 participants) were included; 23 included home visits. Evidence from 11 studies (5311 participants) indicated no differences in likelihood of reports to Child Protective Services within 1 year of intervention completion (pooled odds ratio, 1.03 [95% CI, 0.84-1.27]). Five studies (3336 participants) found no differences in removal of the child from the home within 1 to 3 years of follow-up (pooled risk ratio, 1.06 [95% CI, 0.37-2.99]). The evidence suggested no benefit for emergency department visits in the short term (<2 years) and hospitalizations. The evidence was inconclusive for all other outcomes because of the limited number of trials on each outcome and imprecise results. Among 2 trials reporting harms, neither reported statistically significant differences. Contextual evidence indicated (1) widely varying practices when screening, identifying, and reporting child maltreatment to Child Protective Services, including variations by race or ethnicity; (2) widely varying accuracy of screening instruments; and (3) evidence that child maltreatment interventions may be associated with improvements in some social determinants of health.

CONCLUSION AND RELEVANCE The evidence base on interventions feasible in or referable from primary care settings to prevent child maltreatment suggested no benefit or insufficient evidence for direct or proxy measures of child maltreatment. Little information was available about possible harms. Contextual evidence pointed to the potential for bias or inaccuracy in screening, identification, and reporting of child maltreatment but also highlighted the importance of addressing social determinants when intervening to prevent child maltreatment.

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Supplemental content

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Child maltreatment—abuse and neglect in childhood—can result in serious negative physical, psychological, and behavioral consequences that can span a life course and have potential effects on subsequent generations.[1,2] In theory, efficacious preventive interventions may avert child maltreatment and its negative sequelae. In 2018, the US Preventive Services Task Force (USPSTF) concluded that the evidence was insufficient to assess the balance of benefits and harms of primary care interventions to prevent child maltreatment.[3] This review updates the evidence on primary care–based or referable interventions to prevent maltreatment among children and youth 18 years and younger to inform an updated statement by the USPSTF.

Methods

Scope of the Review

The analytic framework and key questions that guided the review are shown in **Figure 1**. Detailed methods, evidence tables, and information on 3 contextual questions (CQs) are available in the full evidence report; the CQs are shown in Figure 1.[4] CQs addressed overall patterns and variations by race/ethnicity in identification/diagnosis and reporting, accuracy of risk assessment tools, and association between child maltreatment prevention interventions and social determinants of health (SDOH).

Data Sources and Searches

PubMed, the Cochrane Library, and Health and Psychosocial Instruments were searched for English-language articles published from June 18, 2016, through February 2, 2023. ClinicalTrials.gov and the World Health Organization International Clinical Trials Registry Platform were also searched. To supplement systematic electronic searches (eMethods in the Supplement), reference lists of pertinent articles and studies suggested by reviewers were also searched. Article alerts and targeted searches of journals to identify major studies published in the interim that may affect the conclusions or understanding of the evidence and the related USPSTF recommendation were used as part of ongoing surveillance. The last surveillance was conducted on December 6, 2023, and identified no studies affecting the findings.

Study Selection

Two investigators independently reviewed titles, abstracts, and full-text articles using prespecified inclusion criteria for each key question (eMethods in the Supplement); disagreements were resolved by discussion or by a third reviewer. English-language studies that included children and adolescents 18 years or younger, were of fair or good methodological quality, and were conducted in countries categorized as very highly developed by the 2018 United Nations Human Development Index[5] were eligible. Inclusion was restricted to English-language, randomized clinical trials (RCTs) of youth through age 18 years (or their caregivers) with no known exposure or signs or symptoms of current or past maltreatment that reported direct measures of abuse or neglect (reports to Child Protective Services [CPS], removal of the child from the home) or proxies for abuse or neglect (injury, visits to the emergency department, hospitalization), or harms. For such studies, we also synthesized the evidence on behavioral, developmental, emotional, mental, or physical health and well-being and mortality. Studies that included a majority of participants who had previously been reported for maltreatment were ineligible for the review.

Data Extraction and Quality Assessment

For each included study, 1 reviewer abstracted relevant study characteristics and outcomes into a structured form. A second reviewer checked all data for completeness and accuracy. All studies were rated dually and independently using predefined quality criteria established by the USPSTF (eMethods in the Supplement) and others.[6,7] Disagreements in study quality ratings were resolved through discussion or by a third senior reviewer. Detailed study quality assessments are provided in eTables 1-5 in the Supplement.

Data Synthesis and Analysis

Data were synthesized in tabular and narrative forms. When at least 3 similar studies were available, a quantitative synthesis was performed using random-effects models with the inverse-variance weighted method of DerSimonian and Laird in Comprehensive Meta-Analysis version 3.3 to generate pooled estimates of effect.[8,9] The I^2 statistic was calculated to assess statistical heterogeneity.[10] Significance testing was based on the exclusion of the null value by the 95% CI around the pooled estimate; all testing was 2-sided.

The strength of evidence was assessed as high, moderate, low, or insufficient using methods developed for the USPSTF and the Agency for Healthcare Research and Quality Evidence-based Practice Center program.[7,11] Two senior reviewers independently developed initial strength-of-evidence assessments; disagreements were resolved through discussion or input of a third senior reviewer.

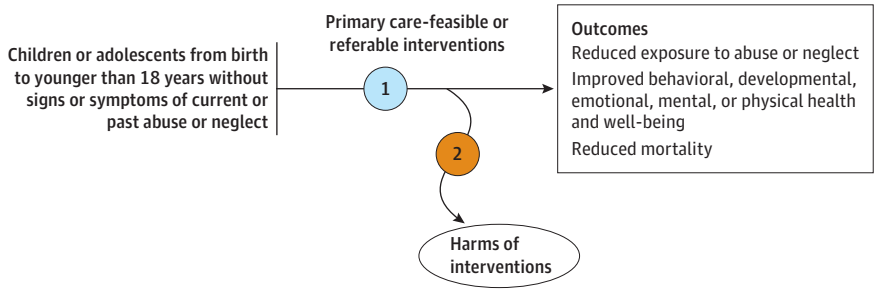
Results

Twenty-five studies described in 43 publications were eligible (**Figure 2**).[12-54] A list of full-text articles that were screened but excluded is provided in the List of Excluded Studies section in the Supplement. **Table 1** summarizes study characteristics, and eTables 6-10 in the Supplement provide details.

The majority of studies enrolled participants in the prenatal period or immediately after birth (60%). Sixty-eight percent of the studies recruited participants based on parents being judged to be at risk of maltreating children (based on demographic, social, economic, or other factors such as teen or single parenthood, parenting skills and efficacy, mental health issues, domestic violence, substance use, homelessness or housing instability, incarceration, isolation, learning problems or educational status, or serious financial difficulties) or children being at risk of maltreatment because of prematurity or low birth weight. Twenty-four percent of the studies included at least some (but not a majority of) participants who had previously been reported for maltreatment. Almost one-third of the studies recruited young mothers (age <20 years). Nearly two-thirds of studies included a population that was more than 25% non-White, and nearly one-fourth of studies included a population that was more than 25% Hispanic or Latina/o.

All but 2 studies evaluated home-visiting interventions. Of those 2 trials, one was a clinic-based intervention for parents entering outpatient substance abuse treatment[25] and the other was a group Family Nurse Partnership intervention held in children's centers, health

Figure 1. Analytic Framework: Primary Care Interventions to Prevent Child Maltreatment



Key questions

1. For children without obvious signs and symptoms of abuse or neglect, do primary care-feasible or referable preventive interventions reduce exposure to abuse or neglect; improve behavioral, developmental, emotional, physical, or mental health and well-being; or reduce mortality? Does the effectiveness of interventions differ by populations of interest (eg, defined by child or caregiver characteristics such as age, developmental stage of the child, sex, gender identity, race and ethnicity, sociodemographic characteristics [rural/urban location, place of residence, family income or wealth], or special health care needs)?

2. What are the harms from interventions intended to prevent child maltreatment? Do the harms of interventions differ by populations of interest (eg, defined by child or caregiver characteristics such as age, developmental stage of the child, sex, gender identity, race and ethnicity, sociodemographic characteristics [rural/urban location, place of residence, family income or wealth], or special health care needs)?

Contextual questions

1. What are current practices for (a) identifying children at risk of maltreatment, (b) referring children or families to prevention programs, (c) reporting children or families to child protective services, and (d) diagnosing child maltreatment outcomes? Do current practices in identification, referral, reporting, and diagnosis of outcomes of child maltreatment differ by race or ethnicity of the child or caregiver? If evidence exists of practice differences, what factors might explain these differences?

2. What are the validity and reliability of risk assessment tools to identify children and adolescents who are at risk of child maltreatment? Does the reported validity and reliability (of risk assessment tools) differ by race and ethnicity? If yes, what might explain these differences? Is there evidence that these tools alter or increase inequity?

3. What are the effects of primary care-feasible or referable preventive interventions that report on child maltreatment outcomes on social determinants of health? Do primary care-feasible or referable preventive interventions that report on child maltreatment outcomes examine the association between social determinants of health and child maltreatment outcomes?

centers, or other community facilities.[34,53] Home-visiting interventions included support and information related to topics such as positive parent-child interactions, child health and development, social support, child environmental safety, and health behavior during pregnancy and early childhood. Some interventions also included medical care, referrals, and linkages to community resources. Many of the interventions included weekly or monthly home visits; home-visiting intervention duration ranged from 3 months to 3 years. In a majority of trials clinical personnel (eg, nurses, midwives, social workers, therapists) delivered the intervention (68%).

All but 3 studies compared interventions with usual care.[17,25,29] These 3 studies compared child maltreatment–specific intervention variants with more intense care or with no care.[17,25,29]

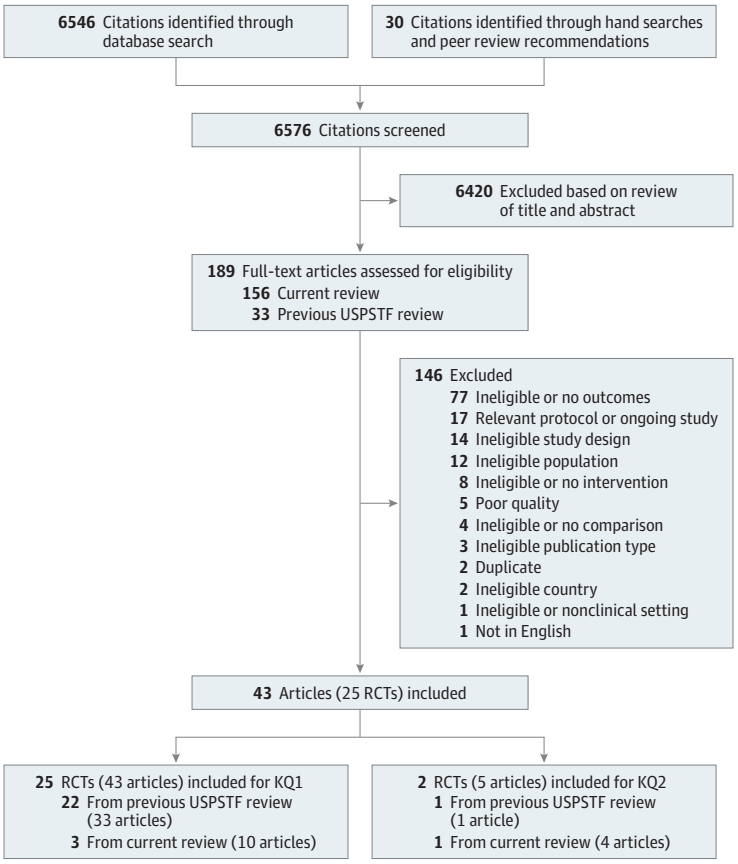
Benefits of Preventive Interventions

Key Question 1. For children without obvious signs and symptoms of abuse or neglect, do primary care–feasible or referable preventive interventions reduce exposure to abuse or neglect; improve behavioral, developmental, emotional, physical, or mental health and well-being; or reduce mortality? Does the effectiveness of interventions differ by populations of interest (eg, defined by child or caregiver characteristics such as age, developmental stage of the child, sex, gender identity, race and ethnicity, sociodemographic characteristics [rural/urban location, place of residence, family income or wealth], or special health care needs)?

Direct or Proxy Measures of Child Maltreatment

Reports to Child Protective Services | Fifteen RCTs reported in 27 publications[12-14,16,18-20,23-28,33,35,37-42,45-48,51,52] analyzed the association between child maltreatment interventions and likelihood of reports to CPS (eTables 11-14 in the Supplement). All except 1 trial reported initial results during the intervention (1 year from baseline), at the end of the intervention, or within a year of completing the intervention. The exception was a study that reported referral to children's social care for abuse or neglect when the child was 6 years old. A subset of trials reported outcomes at 1 or more time points after the first analysis of results. The timing of these

Figure 2. Literature Search Flow Diagram: Primary Care Interventions to Prevent Child Maltreatment



KQ indicates key question; RCT, randomized clinical trial; and USPSTF, US Preventive Services Task Force.

reports varied, from within 6 months of the initial results[13,19,28] to 13 years after the initial results.

The pooled odds ratio (OR) from 11 trials, based on results within about a year of completion, suggested no difference between child maltreatment intervention and control groups (OR, 1.03 [95% CI, 0.84-1.27]; I^2 = 10.2%; 341/2635 [12.9%] vs 307/2519 [12.2%]; 11 trials [n = 5311]) (eFigure 1 in the Supplement). Trials reporting additional results within 6 months[28] or 1 year[13,19] of the original results also reported no difference between the groups. Trials measuring outcomes for later time points (with follow-up ranging from 3 to 15 years) provided mixed results: 2 trials reported statistically significant differences (in favor of the intervention),[13,46,47] and 2 reported no differences (with wide and imprecise confidence intervals).[19,40]

Removal of Child From Home | Six RCTs[14-16,22,30,35,38] reported on outcomes relating to removal of the child from the home. Five trials contributed to a pooled analysis at 12 months to 3 years after baseline (eTables 15 and 16 in the Supplement)[14-16,30,35,38] The results showed no statistically significant differences between child maltreatment intervention and control groups (68/1751 [3.9%] vs 55/1585 [3.5%]; relative risk [RR], 1.06 [95% CI, 0.37-2.99]; I^2 = 49.9%; 5 trials [n = 3336]) (eFigure 2 in the Supplement). One other study reported on number of days in out-of-home placement and reported no statistically significant difference (15.2 days for the intervention group vs 12.7 days for the comparator group, P = .43).[35]

Other Measures of Abuse or Neglect | Two RCTs[15,17] reported on study-specific measures of abuse (eTables 17 and 18 in the Supplement). These included physical abuse[11] and neglect[15] and results from the Framingham Safety Survey about household hazards.[17] One trial reported no statistically significant differences and wide confidence intervals, finding 13 of 141 cases (9.2%) of physical abuse in the child maltreatment intervention group vs 8 of 122 (6.6%) in the control group (RR, 1.45 [95% CI, 0.58-3.62]). The same study[15] reported 15 of 141 cases (10.6%) of neglect in the intervention group vs 5 of 122 (4.1%) in the comparator group (RR, 2.79 [95% CI, 0.98-7.91]).[15] The second found that the child maltreatment intervention was associated with greater safety based on the Framingham Safety Survey compared with the control group (score, 1.72 vs 1.68 [scale not described]; P = .03).[17] A third trial, in the United Kingdom, reported the outcome of safeguarding, defined as actions to protect children from harm and promote their welfare, including actions beyond reports to child protection. The study found that the child maltreatment intervention was associated with increased likelihood of safeguarding when compared with control (adjusted OR, 1.85 [95% CI, 1.02-2.85]).[33]

Injuries With a High Specificity for Abuse or Neglect | The evidence on injuries with high specificity for abuse or neglect was sparse and very imprecise, derived from a single RCT that included only 1 nonaccidental injury in the control group (0/65 vs 1/71; calculated RR, 0.36 [95% CI, 0.025-8.77]) (eTable 19 in the Supplement).[30]

Emergency Department Visits | Fourteen RCTs reported on emergency department visits (eTables 20-23 in the Supplement).[14,16,18,20,21,23,24,28,29,31-34,38,39,42,43,45-52,54] Lower emergency department visit rates in the intervention group were interpreted as beneficial. The results were generally inconsistent in direction of effect. The timing and type of outcome measurement varied substantially across trials, and several trials presented outcomes at multiple periods.

Hospitalization: Findings | Thirteen RCTs reported on hospitalization outcomes (eTables 24-27 in the Supplement).[14,16,18,20,21,24,28,30,32-34,38,39,42,45,49-52] Outcomes varied in their degree of specificity to child abuse and neglect. For example, highly specific measures included the number of children with hospital admission as a result of an injury that were referred for independent investigation by the Family and Children's Services staff and whose injuries were concluded to be nonaccidental[20]; nonspecific measures included proportions with[14,28,32,38,39,49] and mean number of all-cause hospitalization.[21,32,45] In general, the evidence did not demonstrate benefit for the active intervention group(s), regardless of the specificity of the outcome measure to child abuse or neglect.

Failure to Thrive | The evidence was sparse and very imprecise, derived from a single RCT that included only 1 report of failure to thrive (0/39 [0%] for the intervention group vs 1/40 [2.5%] for the control group; calculated RR, 0.34 [95% CI, 0.01-8.14])[16] (eTable 28 in the Supplement).

Failure to Immunize | One RCT reported on failure to immunize and found no statistically significant differences between study groups in the rate of no vaccinations at 6 months (calculated RR, 0.41 [95% CI, 0.13-1.26])[30] (eTable 29 in the Supplement).

Behavioral, Developmental, Emotional, Physical, or Mental Health and Well-Being

Internalizing and Externalizing Behavior | Six RCTs reported on internalizing (depression, anxiety) and externalizing (disruptive, aggressive, or delinquent) behavioral outcomes in children (eTables 30-32 in the Supplement).[13,18-21,31,39-43,49] The evidence included substantial heterogeneity in the timing and type of outcome measurement. Results were inconsistent. Three trials found a reduction in behavior difficulties in children in the intervention groups[13,18,20,39,42]; the remainder reported no statistically significant differences between study groups.[19,21,31,40,41,43,49]

Social, Emotional, and Other Developmental Outcomes Not Otherwise Categorized | Five RCTs evaluated social, emotional, or other developmental outcomes separately from overall measures of externalizing or internalizing problems (eTables 33-35 in the Supplement).[13,14,31,38,40,43,49] The heterogeneity of outcomes precluded meta-analysis, but no trials reported statistically significant differences between intervention and control groups.

Child Development as Measured by the Bayley Scales of Child Development | Four RCTs[14,18,21,23,38,39,43,45-48] reported on child development as measured by the Bayley Scales of Child Development (eTables 36-38 in the Supplement). The results generally

Table 1. Characteristics of Interventions to Prevent Child Maltreatment

Study characteristics and subcharacteristics[a]	Studies, No. (%)
Study quality	
Good	1 (3.3)
Fair	24 (80)
Poor	5 (16.7)
Population characteristics	
Enrollment	
Enrolled in prenatal period or immediately after birth	15 (60)
Enrolled prenatally, immediately after birth, and after the perinatal period	1 (4)
Enrolled after the perinatal period	9 (36)
Maltreatment reported at baseline	
Yes	6 (24)
No	19 (76)
Risk status	
Parent identified to be at risk	15 (60)
Child identified to be at risk because of birth status (premature or low birth weight)	2 (8)
Participants not specifically identified to be at risk	8 (32)
Age of mothers	
Most or all younger than 20 y	7 (28)
20 y or older on average	18 (72)
Race (study population)	
≥25% non-White	16 (64)
<25% non-White	5 (20)
NR	4 (16)
Ethnicity (study population)	
≥25% Hispanic or Latina/o	6 (24)
<25% Hispanic or Latina/o	6 (24)
NR for Hispanic or Latina/o	13 (52)
Intervention characteristics	
Home visits	
Home visit component	23 (92)
No home visit component	2 (8)
Personnel	
Clinical personnel involved in care	17 (68)
No clinical personnel	8 (32)
Comparator	
Usual-care comparator	22 (88)
No usual-care comparator[b]	3 (12)
Geographic setting	
United States	18 (72)
United Kingdom	4 (16)
Canada	1 (4)
Australia	1 (4)
New Zealand	1 (4)

Abbreviation: NR, not reported.

[a] For all characteristics other than study quality, the table presents data from good- or fair-quality studies only.

[b] One study compared standard behavioral couples therapy or combined parent skills and behavioral couples therapy with individual-based treatment[25]; a second study compared a cognitively based extension of the Healthy Start home visitation program with a visitation condition that did not include this component[17]; and a third study compared home visits with no home visits or other forms or intervention.[29]

indicated no differences between intervention and control groups, with the exception of some results from 1 trial[39] that found a statistically significant difference in the Bayley Mental Development Index among children in the experimental group (mean score, 88 vs 84.8; difference, 3.2 [95% CI, 1.2-5.2]; <85 is the threshold for mild delay).[39]

Other Developmental Outcomes | Five RCTs reported on other developmental outcomes, which varied substantially in constructs (mother-infant communication, attachment, clinically concerning language development, intelligence quotient, maternal concerns regarding cognition) and specific measures (eTables 39-42 in the Supplement).[13,23,27,33,45,49] Although the results could not be pooled, 3 of 5 trials suggested at least some benefit on different measures of outcomes[13,27,33]; the remainder reported no statistically significant differences between study groups.[23,45,49]

School Performance and Attendance | Three RCTs assessed varied school performance outcomes and did not consistently report statistically significant differences between groups (eTables 43-48 in the Supplement).[33,40,43] Two trials reported multiple measures of school attendance outcomes and, as with school performance, did not consistently report significant differences between groups.[33,40,51,52]

Other Outcomes

Death | Of 6 RCTs reporting mortality, none reported statistically significant differences in the rates of child death between intervention and usual-care groups (eTable 49 in the Supplement)[14,16,30,33,34,43,51,52]; rates of mortality were low, and estimates were very imprecise.

Composite Outcome | One RCT reported on a composite outcome composed of infant death, severe nonaccidental injury, and involuntary foster care placement (eTable 50 in the Supplement).[30] The study reported no differences between the child maltreatment intervention and the control group before adjusting for covariates (2/65 [3%] for 1 death, 1 foster care placement vs 9/71 [12.7%] for 2 deaths, 1 injury, 6 foster care placements; RR, 0.24 [95% CI, 0.05-1.08]); after covariate adjustment, the RR was 0.22 (95% CI, 0.02-0.98).

Harms of Preventive Interventions

Key Question 2. What are the harms from interventions intended to prevent child maltreatment? Do the harms of interventions differ by populations of interest (eg, defined by child or caregiver characteristics such as age, developmental stage of the child, sex, gender identity, race and ethnicity, sociodemographic characteristics [rural/urban location, place of residence, family income or wealth], or special health care needs)?

Two RCTs from 5 publications reported on harms but did not report on specific prespecified harms such as stigma, labeling, legal risks, risks of further harm to the child, or dissolution of families or worsening of inequities (eTable 51 in the Supplement).[33,34,51-53] In 1 study, adverse events included miscarriage/terminations, late miscarriage, suspected miscarriage/termination, and infant death (0 vs 1).[34,53] These events occurred before the participants could begin attending group Family Nurse Partnership sessions and were thus unlikely to be related to the intervention. The second study (n = 1618) found that the child maltreatment intervention was associated with slightly increased risk of a serious adverse event (defined as primarily clinical events associated with pregnancy and infancy period) vs usual care (43% vs 38%; calculated RR, 1.15 [95% CI, 1.03-1.25]).[33] However, no adverse events were judged to be related to the intervention. The numbers of specific adverse events (miscarriages/terminations, stillbirth/neonatal death/infant death, death of the mother/infant pair, and adoption of the child) were similar between groups.

Discussion

Table 2 summarizes the evidence, including ratings of the strength of evidence. The evidence on interventions that are feasible in or referable from primary care settings suggested no benefit for short-term outcomes for interventions to prevent child maltreatment on reports to CPS, removal of the child from the home, emergency department visits, or hospitalizations. Long-term results for the same outcomes were sparse and inconsistent.[13,19,40,45-47,49,51,52] Other concerns with long-term outcomes included risks of contamination (in which elements of the intervention become part of usual care over time or in which individuals in the usual-care group receive the intervention) or unmeasured co-interventions. Additionally, interpretation of some outcomes could be challenging. Lower rates of all-cause emergency department visits or hospitalization may represent changes in patterns of health care utilization as a result of the intervention rather than lower rates of abuse or neglect. The evidence was also inconclusive for other outcomes due to the limited number of trials reporting on each outcome, inconsistency, and imprecision. These other outcomes included injuries, failure to thrive, failure to immunize, internalizing and externalizing behavior symptoms, child development, school attendance, school performance, prevention of death, and other measures of abuse or neglect.

Significant uncertainties persist in interpreting the evidence. Ethical study design requires comparisons of interventions to prevent child maltreatment with enhanced usual care. The extent to which interaction with observers and staff offering care (eg, nurses, social workers, community health workers) in usual-care groups attenuates intervention effects remains unclear. Surveillance bias in the intervention group (which often includes frequent interaction, including home visits) may also increase the rates of negative outcomes (for example, safeguarding actions,[33] reports to CPS, or emergency department visits) in the intervention group, further obscuring potential benefits of the interventions. Participants in the usual-care or other control groups have less interaction with staff offering care and are less likely to be subject to surveillance.

Two studies did not report statistically significant adverse events between study groups. However, the studies focused on rare harms (such as miscarriages, terminations, stillbirth, infant or neonatal death, maternal death), and as a result, the findings were very imprecise and therefore inconclusive. No studies reported on harms such as stigma, labeling, legal risks, risks of further harm to the child, or dissolution of families, or on worsening of inequities. No study evaluated how harms varied according to factors such as race and ethnicity.

Table 2. Summary of Evidence of Interventions to Prevent Child Maltreatment

Outcome	Population, intervention	No. of studies and observations	Summary of findings by outcome	Consistency/ precision	Reporting bias	Body of evidence limitations[a]	EPC assessment of strength of evidence	Applicability
KQ1: Benefits of preventive interventions								
Reports to CPS	Caregivers of children at risk of maltreatment	15 Studies[12-14,16,18-20,23-28,33,35,37-42,45-48,51] 8513 Observations	CPS reports at or within 1 y of trial completion: OR, 1.03 (95% CI, 0.86-1.27); I^2 = 10.2%; 12.9% vs 12.2% (11 studies, 5311 participants[b]) Mixed results for long-term follow-up[b]	Short-term outcomes: Consistent Imprecise Long-term outcomes: Inconsistent Imprecise	No evidence of reporting bias	Heterogeneity across studies in type of intervention	Low for no benefit for short-term outcomes, insufficient for long-term outcomes	Unclear whether findings apply to subgroups defined by parent risk factors
Removal of the child from home	Infants/toddlers aged ≤3 y	6 Studies[14-16,22,30,35,38] 3657 Observations	Removals 0-3 y: 68/1751 (3.9%) vs 55/1585 (3.5%); RR, 1.06 (95% CI, 0.37-2.99); I^2 = 49.9% (5 studies, 3336 participants) Removals at birth (for intervention started in pregnancy) in 1 study: calculated RR, 2.33 (95% CI, 0.66-8.20); 225 participants	Inconsistent Imprecise	No evidence of reporting bias	Heterogeneity across studies in timing of outcome	Low for no benefit	Unclear whether findings apply to subgroups defined by parent risk factors
Other measures of abuse or neglect	Caregivers (mothers or families)	3 Studies[15,17,33] 2106 Observations	Abuse[c]: 13/141 (9.2%) vs 8/122 (6.6%); RR, 1.4 (95% CI, 0.58-3.62); 1 study, 263 participants Neglect[d]: 15/141 (10.6%) vs 5/122 (4.1%); RR, 2.79 (95% CI, 0.98-7.91); 1 trial, 263 participants Significantly higher safety scores in the intervention group; 1 trial, 141 participants Higher rates of safeguarding actions in the intervention group: adjusted OR, 1.85 (95% CI, 1.02-2.85); 1 trial, 945 participants	Inconsistent Imprecise	No evidence of reporting bias	Heterogeneity across studies in outcome measures	Insufficient	Unclear whether findings apply to subgroups defined by parent risk factors
Injuries with high specificity for abuse	Adolescent mothers	1 Study[30] 136 Observations	Nonaccidental injuries: 0/65 (0%) vs 1/71 (1.4%); calculated RR, 0.36 (95% CI, 0.015-8.77)	Consistency unknown (single trial) Imprecise	No evidence of reporting bias	Single small trial	Insufficient	Unclear whether findings apply to subgroups defined by parent risk factors
Visits to ED	Children	14 Studies[14,16,18,20,21,23,24,28,29,31-34,38,39,42,43,45-52,54] 8180 Observations	Two of 4 studies reported a statistically significant difference in the mean difference of ED visits at 2 mo[34] and age 6 mo[54]; the other 2 studies reported results that were not statistically significant at age 6 mo[28,33] Three of 8 studies reported a statistically significant difference in mean number of all-cause ED visits from 1 to 2 y of follow-up[23,28,34]; all other studies report results that are not statistically significant[23,24,29,32,38,45-48,50,54] One of 2 studies reported statistically significant results at the 2- to 4-y follow-up for each of the following: mean number of all-cause ED visits[23]; mean number of ED visits for accidents, injuries, and ingestions[23]; and number of children seen for accidents or injuries[20,42]; 2 studies found no differences for number of children seen in the ED[18,31,39]; 1 study found no difference in the proportion of children seen for injuries and ingestions[33] One of 3 studies reported statistically significant differences at long-term follow-up[45]	Inconsistent Imprecise	No evidence of reporting bias	Heterogeneity across studies in outcome measures	Low for no benefit for short-term outcomes, insufficient for long-term outcomes	Unclear whether findings apply to subgroups defined by parent risk factors

(continued)

Table 2. Summary of Evidence of Interventions to Prevent Child Maltreatment (continued)

Outcome	Population, intervention	No. of studies and observations	Summary of findings by outcome	Consistency/ precision	Reporting bias	Body of evidence limitations[a]	EPC assessment of strength of evidence	Applicability
Hospitalization	Infants	13 Studies[14,16,18,20,21,24,28,30,32-34,38,39,42,45,49-52] 7475 Observations	One of 5 studies showed a reduction in number of children with all-cause hospitalization, but only for 1 of 4 outcome measures[28] One study found a statistically significant mean difference in number of children hospitalized at 12 mo in 1 of 5 hospital wards and no statistically significant differences in any of the 5 wards at 2 mo[34] Two of 4 studies found a lower mean number of hospital days or fewer total days hospitalized of injuries or ingestions[21,45] One trial found lower overall rates of hospital admission for unintentional injury at 9-y follow-up[20,42] All other outcomes are not statistically significantly different[e]	Results under 3 y: Consistent Imprecise Long-term follow-up: Inconsistent Imprecise	No evidence of reporting bias	Heterogeneity outcome measures; each outcome/ timing only presented in a single study	Low for no benefit	Unclear whether findings apply to subgroups defined by parent risk factors
Failure to thrive	Infants	1 Study[16] 79 Observations	0/39 (0%) vs 1/40 (2.5%); RR, 0.34 (95% CI, 0.01-8.14)	Consistency unknown (single trial) Imprecise	No evidence of reporting bias	Single small trial	Insufficient	Unclear whether findings apply to subgroups defined by parent risk factors
Failure to immunize	Adolescent mothers	1 Study[30] 136 Observations	No vaccinations at 6 mo: 4/71 (5.6%) vs 9/65 (13.8%); calculated RR, 0.41 (95% CI, 0.13-1.26)	Consistency unknown (single trial) Imprecise	No evidence of reporting bias	Single small trial	Insufficient	Unclear whether findings apply to subgroups defined by parent risk factors
Internalizing and externalizing behavior symptoms	Caregivers of children at risk of maltreatment	6 Studies[13,18-21,31,39-43,49] 5115 Observations	Three of 6 trials reported reductions in behavior difficulties[f] Other outcomes not statistically significantly different[g]	Inconsistent Imprecise	No evidence of reporting bias	Small number of trials; heterogeneity of outcome measures	Insufficient	Home-based intervention targeting high-risk families may be effective in decreasing behavior problems
Other social, emotional, and developmental outcomes	Infants/toddlers aged ≤3 y	5 Studies[13,14,31,38,40,43,49] 4439 Observations	None of 5 studies reported statistically significant differences on a variety of social, emotional, and developmental measures[h]	Consistent Imprecise	No evidence of reporting bias	Heterogeneity outcome measures; each outcome/ timing only presented in a single study	Low for no benefit for children aged ≤3 y	Unclear whether findings apply to subgroups defined by parent risk factors; one intervention may not be readily generalizable to other (pediatric practice) settings
Bayley Scales of Development	Caregivers and families	4 Studies[14,21,23,39] 1638 Observations	One of 4 trials reported higher scores in the intervention group (mean difference between groups, 3.2 [95% CI, 1.2-5.2])	Consistent Imprecise	No evidence of reporting bias	Outcomes measured at different ages	Low for no benefit	All studies focused on at-risk caregivers and families
Other measures of development	Pregnant mothers	5 Studies[13,23,27,33,45,49] 4542 Observations	Three of 5 trials reported statistically significant differences on other development outcomes but only for a subset of reported outcome measures and timing	Inconsistent Imprecise	No evidence of reporting bias	Heterogeneity in outcome measures	Insufficient	Unclear whether findings apply to subgroups defined by parent risk factors

(continued)

Table 2. Summary of Evidence of Interventions to Prevent Child Maltreatment (continued)

Outcome	Population, intervention	No. of studies and observations	Summary of findings by outcome	Consistency/ precision	Reporting bias	Body of evidence limitations[a]	EPC assessment of strength of evidence	Applicability
School performance	School-aged children	3 Studies[33,40,43,44,51,52] 3561 Observations	Three studies found no difference on varied school performance measures (repeating a grade, test scores, academically focused behavior) assessed at varied times[33,40,43,44,51,52] One of 3 studies reported statistically significant difference in mental processing (Kauffman Assessment Battery for children) at age 6 y (mean, 92.3 vs 90.2; effect size, 0.18; $P = .03$)[44]	Inconsistent Imprecise	No evidence of reporting bias	Heterogeneity in outcome measures	Insufficient	Unclear whether findings apply to groups not defined by parent risk factors
School attendance	School-age children/ families	2 Studies[33,40,51,52] 2818 Observations	One study reported statistically significant difference in attendance based on child report; child-reported school attendance at age 7 years: 9/388 (2.35%) vs 26/405 (6.47%); RR, 0.36 (95% CI, 0.17-0.76)[40] No difference in maternal reports of skipping school or reports from school records[40,51,52]	Inconsistent Imprecise	No evidence of reporting bias	Heterogeneity in outcome measures (self-report, maternal report, pupil database); inconsistency between child and maternal reports	Insufficient	Unclear whether findings apply to groups not defined by parent risk factors
Death	Pregnant or postpartum women; 5 studies included only women at risk for maltreatment, 5 studies included home visiting, 1 study included group intervention	6 Studies[14,16,21,30,33,34,43,51,52] 2900 Observations	None of 6 trials reported statistically significant differences in death	Consistent Imprecise	No evidence of reporting bias	Heterogeneity in included studies	Insufficient	Unclear whether findings apply to subgroups defined by parent risk factors
Composite maltreatment outcome[i]	Mothers of newborns	1 Study[30] 136 Mothers	2/65 (3.1%) vs 9/71 (12.7%); RR, 0.24 (95% CI, 0.05-1.08); adjusted RR, 0.22 (95% CI, 0.02-0.98); $P = .04$	Consistency unknown (single trial) Imprecise	No evidence of reporting bias	Single small trial	Insufficient	Unclear whether findings apply to subgroups other than teenage, first-time mothers

(continued)

Table 2. Summary of Evidence of Interventions to Prevent Child Maltreatment (continued)

Outcome	Population, intervention	No. of studies and observations	Summary of findings by outcome	Consistency/ precision	Reporting bias	Body of evidence limitations[a]	EPC assessment of strength of evidence	Applicability
KQ2: Harms of preventive interventions								
	Pregnant women; 2 home-visiting studies	2 Studies[33,34,52,53] 1784 Observations	Neither of 2 trials reported statistically significant differences in harms	Consistent Imprecise	No evidence of reporting bias	Heterogeneity in outcome assessment	Insufficient	Unclear whether findings apply to subgroups defined by parent risk factors

Abbreviations: CPS, Child Protective Services; ED, emergency department; EPC, Evidence-based Practice Center; KQ, key question; OR, odds ratio; RR, relative risk.

[a] All studies were rated as fair quality.

[b] Long-term CPS reports: adjusted OR, 0.48 (95% CI, 0.23-1.0) in first study (3-year follow-up, 157 participants)[13]; calculated RR, 0.95 (95% CI, 0.80-1.12) in second study (6-year follow-up; adjusted OR, 1.13; 1506 participants)[51,52]; $P > .10$ in third study (5-year follow-up, 1173 participants)[19,40,41]; $P = .04$ in fourth study (13-year follow-up, 216 participants, no effect size provided).[46,47]

[c] Abuse is defined as "hitting with the hand or objects, biting, burning with objects or by immersion, twisting, shaking, throwing or pushing so as to cause a fall, or hair pulling"; identified from review of public agency documents from the Tennessee Department of Human Services.

[d] Defined as "abandonment, leaving a child with an inappropriate caretaker, gross failure to seek medical care, failure to provide shelter or nutrition, or gross failure to provide for normal intellectual development"; identified from review of public agency documents from the Tennessee Department of Human Services.

[e] Outcomes with no statistically significant results include number of hospitalizations because of nonaccidental injury to the neonate (1 study), number of children hospitalized because of child abuse and neglect (1 study), proportion of children hospitalized for injuries and ingestions (2 studies), number of children hospitalized for ambulatory care–sensitive conditions (1 study), number of children rehospitalized (1 study), mean number of all-cause hospitalizations (5 studies), and total count of hospital stays (2 studies).

[f] One study reported statistically significant differences on each of the following: mean and proportion of children with higher externalizing behaviors at 12 months; internalizing behaviors at 2 years and 3 years; and behavior problems at 5, 6, and 9 years.

[g] Outcomes with no statistically significant results include internalizing behaviors at 6 and 12 months (1 study); child behavior at 2 years (1 study), 30 to 33 months and 5.5 years (1 study), and 7 years (1 study); and internalizing and externalizing behaviors at 9 years (1 study).

[h] Outcomes included dysregulation, sleep problems, problems with social skills, attention and social problems, school-related conduct outcomes, and infant social and emotional adjustment.

[i] Defined as infant death, severe nonaccidental injury, and involuntary foster care placement.

Contextual Issues

The CQs requested information on current practices in identifying/diagnosing child maltreatment and reporting and variations by race and ethnicity in these practices (CQ1), the accuracy of risk assessment tools for child maltreatment (CQ2), and the association between child maltreatment prevention interventions and SDOH (CQ3). The Contextual Questions section in the Supplement provides detailed results.

In brief, findings for CQ1 highlighted wide variations in reporting practices, clear presence of disparities by race and ethnicity in reporting, and lack of clarity about reasons for these differences. They also suggest that guidelines, when clear and consistent as in the case of diagnosis, can help reduce racial and ethnic disparities in practice. Findings for CQ2 indicated poor to good accuracy of risk assessment tools. The potential risks of false-positive findings (eg, family separation, trauma for the child and parent, costs) limit reliance on screening as an approach to identifying children at risk.

Regarding the association between interventions to prevent child maltreatment and outcomes representing SDOH (CQ3), 18 of the 25 studies included for this review addressed an SDOH-related outcome, measured using disparate methods and at multiple time points. Overall, findings of interventions were mixed with some positive changes in some SDOH outcomes reported for intervention vs control groups (eg, receipt of well-child care and social support) and no group differences reported for other outcomes. Four studies reported SDOH-related outcomes in subpopulations defined by factors including socioeconomic status and intensity of intervention. Although subgroup definitions varied, 1 study suggested that groups characterized by higher socioeconomic need (as defined by greater use of social services) had higher risk of being reported for maltreatment, but other studies also found that those characterized by higher socioeconomic need experienced greater improvements in SDOH outcomes after receiving child maltreatment interventions than overall study populations. Because surveillance bias may be a factor in explaining the higher rates of maltreatment outcomes in intervention participants with greater social needs, more and better evidence is needed to clarify when and to what extent child maltreatment interventions are linked with improving SDOH and reducing child maltreatment outcomes.

Limitations

This review had several limitations. First, regarding scope, this review focused on interventions feasible in or referable from primary care and their association with direct or proxy measures of maltreatment. As a result, it did not address all potentially relevant policy solutions to prevent child maltreatment, such as changes in social policy at the national, state, county, or municipal level or community, or universal interventions that are not primary care referable. Second, the review did not evaluate whether interventions are effective to reduce repeated abuse among children who have experienced maltreatment in the past. Third, although the contextual assessment suggested at least some beneficial associations with SDOH, this review did not address other outcomes such as family or maternal well-being or mental health. Fourth, methodological limitations included restriction to English and limited information to address publication bias. Fifth, limitations in the evidence included the heterogeneity in outcome measurement and risk of surveillance bias in the intervention groups.

Conclusions

The evidence base on interventions feasible in or referable from primary care settings to prevent child maltreatment suggested no benefit or insufficient evidence for direct or proxy measures of child maltreatment. Little information was available about possible harms. Contextual evidence pointed to the potential for bias or inaccuracy in screening, identification, and reporting of child maltreatment but also highlighted the importance of addressing social determinants when intervening to prevent child maltreatment.

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Concept and design: Viswanathan, Rains, Hart, Sathe, Hudson, Ali, Jonas, Chou, Zolotor.
Acquisition, analysis, or interpretation of data: Viswanathan, Rains, Hart, Doran, Sathe, Hudson, Ali.
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