

Trauma, Violence, & Abuse

The effects of primary care-based parenting interventions on parenting and child behavioral outcomes: A systematic review

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review

THE EFFECTS OF PRIMARY CARE

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4 The effects of primary care-based parenting interventions on parenting and child behavioral
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6 outcomes: A systematic review
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9 It was estimated that 683,000 children in the U.S. were victims of maltreatment in 2015,
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11 including 1,670 fatal cases (U.S. Department of Health & Human Services, Administration for
12
13 Children and Families, Administration on Children, Youth and Families, & Children's Bureau,
14
15 2016). Maltreatment exposure is associated with myriad consequences, including academic
16
17 underachievement, an increased likelihood of receiving special education services, and a higher
18
19 risk of developing internalizing and externalizing behavioral problems as well as childhood
20
21 obesity, eating disorders, and an array of other health problem (Leenarts, Diehle, Doreleijers,
22
23 Jansma, & Lindauer, 2013; Norman, Byambaa, De, Butchart, Scott, & Vos, 2012).
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27
28 In 2008 alone, the cost to address a non-fatal child maltreatment case was reported to be as
29
30 large as \$210,000, including medical costs, productivity losses, welfare costs, criminal justice
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32 costs, and special education costs (Fang, X., et al., 2012). The impact of maltreatment reaches far
33
34 beyond the individual level, creating substantial burdens to the entire society. Given the serious
35
36 impact of maltreatment at the micro and macro level, the Centers for Disease Control and
37
38 Prevention (CDC) recognized child maltreatment as an important public health issue in late
39
40 1990s and has made consistent efforts to prevent maltreatment.
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44 Two of the CDC's major strategies for maltreatment prevention involve supporting parents
45
46 and enhancing positive parenting. The focus on parents is a logical direction given that a
47
48 majority of maltreatment cases are known to involve at least one parent as a perpetrator (Fortson
49
50 et al., 2016). It is widely known that harsh or ineffective discipline, involving verbal, emotional
51
52 and physical aggression is associated with maltreatment and poor developmental outcomes
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54 (Bender et al., 2007; Weiss, Dodge, Bates, & Pettit, 1992). On the other hand, parents' ability to
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4 create a nurturing environment through positive parent-child relationships early in a child's life
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6 represents an important protective factor that can mitigate the effects of children's exposure to
7
8 various adversities (Shonkoff, 2012). A solid body of evidence suggests that positive parenting
9
10 practice can be learned through participation in behavioral parenting interventions (Shaffer,
11
12 Kotchick, Dorsey, & Forehand, 2001).
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16 Despite accumulated evidence of the benefits of behavioral parenting interventions, most of
17
18 them focus on parents and children with identified needs, thus creating stigma toward
19
20 participants (Barth & Liggett-Creel, 2014; Leslie et al., 2016). Access to these interventions for
21
22 parents without identified needs continues to be limited despite expressed needs (Zero to Three,
23
24 2016). Moreover, parenting interventions have been consistently related with low participation
25
26 and high attrition rates due to parents' competing priorities, scheduling, and transportation issues
27
28 (Heinrichs, Bertram, Kuschel, & Hahlweg, 2005; Leslie et al., 2016; Marshall, Green, & Spiby,
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30 2014; Nix, Bierman, & McMahon, 2009; Zero to Three, 2016).
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34 Recognizing these concerns, alternative strategies have been explored for disseminating
35
36 parenting interventions to a wider audience by targeting parents with and without identified
37
38 needs. An array of approaches has been explored, including universal or early intervention
39
40 parenting programs as well as multilevel, population-based parenting interventions (Altafim &
41
42 Linhares, 2016; Barth, 2009). Amid this exploration, primary care has been increasingly
43
44 identified as a "potential home" for parenting interventions (Leslie et al., 2016, p. 106).
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48 Several factors contribute to the value of primary care as a potential home for parenting
49
50 interventions. Most importantly, the target audience (i.e., parents) typically has ongoing access to
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52 primary care in the context of sick and well-child care, providing a natural access point to the
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54 interventions without stigma (Leslie et al., 2016). Additionally, child rearing guidance has long
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4 been recognized as an important part of a pediatrician's job. As early as the 1990s, the American
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6 Academy of Pediatrics (AAP) Committee on Psychosocial Aspects of Child and Family
7
8 published a statement regarding effective discipline strategies, based upon which pediatricians'
9
10 anticipatory guidance have been developed (Regalado, Sareen, Inkelas, Wissow, & Halfon,
11
12 2004). Parents also perceive physicians as a trustworthy source of information related to
13
14 parenting and want to receive support from healthcare professionals in broad developmental
15
16 areas of parenting including sleeping, feeding, toileting as well as discipline strategies, behavior
17
18 management, schooling, sibling rivalry, shyness, and sex education (Long, 1998; Marshall et al.,
19
20 2014). Thus, parenting guidance in primary care is not entirely new to providers or parents,
21
22 increasing the acceptability of these interventions.
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28 However, analysis of data from the National Survey of Early Childhood Health indicated that
29
30 less than a half of participants received discipline support from their pediatricians. The unmet
31
32 need was much higher for Spanish speaking parents (43%) compared to English speaking
33
34 mothers (20%) (Regalado et al., 2004). Recognizing this gap, increased efforts have been made
35
36 to systematically and strategically integrate parenting interventions into primary care.
37
38 Intervention strategies vary from parent education programs facilitated by physicians or other
39
40 healthcare professionals to more intensive evidence-based parenting interventions led by licensed
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42 behavioral health professionals (Kanoy & Schroeder, 1985; Mendelsohn et al., 2007; Petrowski,
43
44 1981; Webster-Stratton, Reid, & Hammond, 2001). Previous studies have shown that these
45
46 interventions hold promise for promoting positive parent-child relationships and reducing child's
47
48 behavioral problems (Perrin, Sheldrick, McMenemy, Henson, & Carter, 2014). To date, only one
49
50 meta-analysis has been conducted on the topic of primary care-based parenting interventions
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52 (Shah, Kennedy, Clark, Bauer, & Schwartz, 2016). The results indicated significant intervention
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4 effects on parent-child interaction (summary SMD: 0.29, 95% CI: 0.06–0.52, $P < .0001$) and
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6 child reading ability (summary SMD 0.34, 95% CI 0.03–0.54, $P < .001$). The analysis was
7
8 limited to the primary care-based parenting interventions targeting parents of children from birth
9
10 to 3 years of age and the primary outcome of interest was parenting behaviors that promote early
11
12 child development.
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Present Study

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18 Promising results reported by previous studies of primary care-based parenting interventions
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20 and ever-increasing volume of recent works point to the need for a more comprehensive review,
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22 examining a wide array of parenting dimensions and outcomes for children in various age
23
24 groups. As such, the current systematic review was set out to explore 1) what evidence exists
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26 regarding the effectiveness of behavioral parenting interventions delivered in primary care
27
28 settings on enhancing positive parenting; and 2) what evidence exists regarding the effectiveness
29
30 of behavioral parenting interventions delivered in primary care settings on reducing child's
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32 behavioral problems.
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37 For the purpose of this review, parenting interventions are loosely defined as interventions
38
39 seeking to enhance positive parenting in multiple dimensions discussed in previous parenting
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41 literature. The historical paradigm in understanding the roles of parents and parenting practices,
42
43 has changed substantially, and definition of parenting remains elusive (O'Conner, 2002).
44
45 Therefore, the operationalization of parenting and related interventions is purposefully broad
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47 given the exploratory nature of this review. Accordingly, the review encompassed a wide range
48
49 of parent outcomes including, parenting knowledge, parenting behaviors, parenting skills and
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51 techniques, parenting styles, attitudes and beliefs toward parenting, parent affect toward child,
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53 parental competence or self-efficacy, and parental stress.
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Method

The current systematic review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines. The review protocol was published in the International Prospective Register of Systematic Reviews (PROSPERO) on the 15th of February 2017 (registration number: CRD42017056129).

Eligibility Criteria

Randomized controlled trials (RCTs) or quasi-experimental studies with control or contrast groups were included in the review. Interventions had to target caregivers of children between 1 and 17 years of age. Studies had to take place in primary care facilities in the U.S. such as pediatrics, family practice, general practice, and obstetrics and gynecology, which are utilized as primary care for some women. Multiple comparison groups, including wait list groups, delayed participation, treatment as usual (TAU), or no participation in the intervention were included.

The primary outcomes of interest were; 1) parenting outcomes in multiple domains, including parenting knowledge, parenting behavior, parenting skills and techniques, parenting style, parenting attitudes and beliefs, parent affect toward child, parental competence or self-efficacy and other outcomes that have been shown to be closely associated with parenting ability such as parental stress or locus of control; 2) child behavioral outcomes. No restriction was established with regard to the timing of data collection, thus including studies that measured outcomes at post-intervention as well as follow-up points. Studies were considered eligible regardless of the publication type. Only studies written in English were included.

Information Sources

Literature searches were conducted using electronic databases covering a variety of topics related to health, behavioral health, and social sciences, including Medline, Pubmed, CINAHL,

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4 Nursing & Allied Health Database, PsycINFO, Web of Science, and Proquest Dissertation and
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6 Thesis. Additionally, the Campbell Collaboration Library, Cochrane Library, and PROSPERO
7
8 databases were searched to identify systematic reviews and meta-analyses to be used for forward
9
10 and backward searching to enhance comprehensiveness. Grey literature was searched through the
11
12 websites and the databases of the relevant government and private associations, including
13
14 American Academy of Pediatricians, American Academy of Family Physicians, Zero to Three,
15
16 and Blueprints for Healthy Youth Development. Finally, experts in relevant fields were
17
18 consulted for additional sources of grey literature.
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Study Records

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25 **data management.** Data were downloaded into the citation manager software Endnote X7 for
26
27 organization and deduplication. The citations were then imported for screening into the web-
28
29 based systematic review software Covidence, which is one of the recommended tools for
30
31 systematic reviews by Cochrane Community (2017).
32
33

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35 **selection process.** The corresponding author screened the entire list of references while the
36
37 second and third authors divided the references for screening, full-text review, extraction, and the
38
39 risk of bias assessment. The reviewers independently engaged in the title and abstract screening
40
41 against the eligibility criteria. The percent agreement was approximately 87% in the beginning of
42
43 the screening. Any disagreement was resolved through team discussion. The third reviewer
44
45 served as an arbitrator for unresolved disagreement among the first two reviewers. When the
46
47 screening process was completed for about a half of all imported references, the percent
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49 agreement reached 95%, which was maintained until the end of the entire screening process.
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data extraction. Data extraction was conducted using Microsoft Excel spread sheets developed based on the template provided by the Cochrane Collaboration. The data extraction process was an iterative process as new items were added during the extraction process.

risk of bias assessment. The Cochrane Risk of Bias (RoB) tool was used to assess the risk of bias of randomized controlled trial studies included in the review. The first author conducted the risk of bias assessment for the entire list of included studies while the second and the third authors equally divided the number of included studies for the assessment. The risk of bias was as ‘high’, ‘low’, and ‘unclear’ for all studies as suggested by Higgins (2011). For non-randomized studies included in the review, the “Risk of Bias In Non-randomized Studies - of Interventions” (ROBINS-I) was used. The assessment was conducted using the pre-populated template feature in Covidence for consistency among the reviewers and efficient management of the data. The first author made a final judgement based on the assessment and rationale provided by the second and third reviewer.

confidence in cumulative estimate. The quality of body of evidence was examined and critiqued based on the GRADE (Grades of Recommendation, Assessment, Development and Evaluation) approach, focusing on methodological quality, directness of evidence, heterogeneity, precision of effect estimates, and publication bias of the included studies as recommended by the Cochrane Collaboration (2011).

Results

Included Studies

The initial search produced 1,174 studies, which were reduced to 1,009 records after deduplication using the reference managing software, Endnote 7.4. After the title and abstract screening, 896 studies were excluded, resulting in 113 studies to be included in the full-text

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4 review. After the full-text review, 97 additional studies were excluded, resulting in 17 studies to
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6 be included as the final sample. Reason for the exclusion and the process of screening and
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8 review process is summarized in Figure 1. [Insert Figure 1 Here]
9

Study Characteristics

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13 All studies were published articles in peer reviewed journals between the year 1979 and
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15 2016. All studies except two studies (Chamberlin, 1979; Chamberlin & Szumowski, 1980) were
16
17 randomized controlled trials with one or more comparison groups. Nine out of 17 studies
18
19 conducted power analysis to calculate adequate sample size for the expected effect size, with
20
21 power ranging from 80%-90% with a 2-tailed test of statistical significant with an alpha of 0.05.
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Settings and Participants

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27 Most studies took place in pediatric units within the public or university affiliated hospitals
28
29 located in urban areas. Participants were mostly mothers of children under 7 years of age except
30
31 the two studies that included parents of children up to the age of 12 (Aragon et al., 2013) and 15
32
33 (Borowsky, Mozayeny, Stuenkel, & Ireland, 2004). With a few exceptions, most studies focused
34
35 on participants of low income, low education, and ethnic minority immigrants.
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Interventions

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41 Ten interventions including two comparison group interventions were examined in 17
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43 studies. Five interventions were adaptations of existing parenting interventions (e.g., Incredible
44
45 Years: IY, Primary Care Parent-Child Interaction Therapy: PC-PCIT, Child-Adult Relationship
46
47 Enhancement in Primary Care: PriCARE, ezParent program) while others were specifically
48
49 designed to be delivered in primary care settings.
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53 With regard to the delivery format, five interventions required in-person contact, three of
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55 which utilized the group delivery format while the other two was delivered to individual parents
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(Berkovits, O'Brien, Carter, & Eyberg, 2010; Perrin et al., 2014; Schilling et al., 2016). Two interventions were delivered through multimedia such as a CD rom, tablet app, or website (Play Nicely and ezParent program). Two interventions were delivered through written materials such as monthly newsletters, pamphlets, and handouts (Parent Child Interaction Therapy-Anticipatory Guidance and Building Block), which were both comparison interventions. Table 1 presents the summary of the characteristics of the interventions. [Insert Table 1 Here]

Theories of Change

Five interventions were developed based on theories or developed by applying previous theory based-scholarly works. Three major theories of change mentioned were attachment theory (Bowlby, 1969), social learning and self-efficacy theory (Bandura & Walters, 1977), and coercion theory (Patterson, 1982). Attachment theory posits that a primary caregiver's sensitivity toward their child's needs, and the reciprocal interchange of warmth and positive affect, are fundamental for the child in developing secure attachment with the caregiver (Bretherton, 1992). Thus, attachment theory-based parenting interventions contained specific components or techniques that are designed to enhance parents' ability to build positive parent-child interaction such as responsive parenting. For example, PCIT teaches parents Child-Directed Interaction (CDI) skills in which parents are encouraged to praise, reflect, imitate and describe appropriate talk and behaviors with enthusiasm while ignoring inappropriate behaviors (Berkovits et al., 2010). Similarly, PriCARE encourages parents to attend to positive behaviors and IY seeks to promote proactive and nurturing parenting (Perrin et al., 2014; Schilling et al., 2016). Video Interaction Project (VIP) also contains the teaching component where parents are taught skills to positively interact with the child through the use of developmentally appropriate books and toys (Mendelsohn et al., 2007).

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4 On the other hand, social learning principles provide a theoretical basis for content related to
5 effective and consistent limit setting. Bandura (1971) postulated that behaviors are shaped
6 through observing others' behaviors and the consequences resulting from those behaviors. Thus,
7 he believed that behaviors can be shaped by externally manipulating the consequences through
8 rewards, punishments and other behavioral techniques. Parenting interventions based on social
9 learning theory, therefore, view parents as the primary change agents in shaping children's
10 behaviors using behavioral techniques and seek to equip parents with evidence-based skills to
11 manage child behavior. For example, the 3rd segment of the PC-PCIT focuses on teaching
12 parents about Parent Directed Interaction (PDI) skills, including giving child effective and clear
13 commands that are developmentally appropriate with consistent follow through to reduce
14 noncompliance, aggression, and other behavioral problems (Berkovits et al., 2010). Similarly, IY
15 addresses topics related to effective limit setting and handling misbehaviors (Perrin et al., 2014).
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32 Play Nicely, IY, and PCIT also discuss the coercion theory developed by Patterson (1982) as
33 the theoretical foundation of the interventions. The coercion theory describes the process of the
34 development of a child's conduct problems, antisocial behaviors and aggression, which may be
35 established and maintained by poor parenting practices and negative parent-child interactions.
36
37 The theory posits that parents' negative reactions toward child for being non-compliant to the
38 developmentally inappropriate, ineffective, and/or unclear commands given by parents may
39 contribute to the initial activation of child's problem behaviors. As a child's behaviors escalate,
40 parents give in or do not follow through, which signal child that the escalation of their problem
41 behaviors having contributed to the elimination of parental negative reactions. This cycle of
42 coercion is believed to be perpetuated through the mechanism of negative reinforcement within
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4 the family, which with repetition, deprives the child of the opportunity to develop prosocial skills
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6 that are necessary to build healthy relationship with peers and other adults (Thomas, 2011).
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9 Almost all of the parenting interventions examined in the studies, including the ones that did
10
11 not explicitly state the theoretical framework, had some components dedicated to teaching the
12
13 parent to build positive parent-child interactions as well as effective behavior management skills
14
15 to reduce the child's problematic behaviors. Additionally, many interventions drew on multiple
16
17 theories at the same time rather than a single theory.
18

Parent and Child Behavior Outcomes

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22 The studies reported various outcomes within the parenting and child behavioral domains.
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24 Whenever available, total scores instead of subscale scores were reported unless the authors
25
26 specifically mentioned particular subscales. Parent outcomes included parental knowledge of
27
28 child development, parental perceptions and attitudes such as locus of control, parenting self-
29
30 efficacy, or parent perception of the difficulty raising children. Additionally, outcomes related to
31
32 parental control and monitoring, positive and negative parenting and/or discipline skills, as well
33
34 as parent-child interaction were reported. Parent affect measures such as parental depressive
35
36 symptoms and parenting stress were also reported. Child behavior outcomes included the
37
38 intensity and the frequency of problematic behaviors such as aggression, physical fighting,
39
40 inattention, hyperactivity, anxiety, depression, separation distress, and social skills.
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46 With regard to the informant, almost all studies exclusively used parent reports, except the
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48 study of Borowsky et al. (2004), which presented outcomes reported by both parents and youth
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50 (10 years or older) and the study of Perrin et al. (2014), in which the results from analysis of the
51
52 videotaped parent-child interaction using the Coder Impression Inventory were reported for a
53
54 portion of presented outcomes. Most studies used validated measures to assess the outcomes. A
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4 complete list of parent and child behavior outcomes are summarized in Table 2 and Table 3
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6 respectively. [Insert Table 2 Here] [Insert Table 3 Here]
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9 **mediators.** Several studies examined mediating effects of a number of variables on the
10
11 relationship between intervention exposure and parent/child outcome measures. For example, the
12
13 study of Berkule et al. (2014) reported that responsive parenting (measured by StimQ-Infant)
14
15 partially mediated the relationship between intervention and maternal depressive symptoms for
16
17 VIP as evidenced by the reduced association between VIP and depressive symptoms after
18
19 adjustment for parental responsiveness (indirect effect $-.17$, 95% CI $-.36, -.03$)
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22
23 On the other hand, Canfield et al. (2015) found that maternal depression and responsive
24
25 parenting mediated the relationship between participation in VIP intervention and physical
26
27 punishment. The direct effect of VIP on physical punishment at 24 months remained significant
28
29 (direct effect $-.51$, 95% CI $-.90, -.11$), but decreased when responsive parenting (indirect effect
30
31 $-.09$, 95% CI $-.22, -.02$) and maternal psychosocial risk (indirect effect $-.17$, 95% CI $-.36,$
32
33 $-.03$) were added to the model. Maternal psychosocial risk was a single factor yielded by a
34
35 principal components analysis including maternal depressive symptoms and parenting stress.
36
37 Responsive parenting showed a direct negative association with physical punishment while
38
39 maternal psychosocial risk had a direct positive association. Additionally, Mendelsohn et al.
40
41 (2011a) found that parent-child interaction measured mediated the relationship between
42
43 intervention and media exposure for mothers educated 9th grade or higher (Sobel statistic, 2.49;
44
45 $P=.01$) but not for the entire sample (Sobel statistic, 1.62; $P=.10$).
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51 **moderators.** Multiple studies examined moderating effects of child age but did not find
52
53 interaction effects of age with group assignment (Borowsky et al., 2004; Canfield et al., 2015;
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55 Cates et al., 2016). However, in the study of Weisleder et al. (2016), significant positive
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4 interactions between group assignment (VIP, control) and age (14-24 month) was shown on child
5 attention, indicating that VIP children made greater gains in attention than control. Positive
6
7 interaction between the group assignment and age was also found for BB. Lastly, Chamberlin
8
9 and Szumowski (1980) found that knowledge of child development of mothers who received
10
11 services from physicians or nurse practitioners with a low dose of parent education decreased
12
13 with time while the mothers who received services from providers with a high dose of parent
14
15 education improved with time with regard to their developmental knowledge.
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20 With respect to child gender, Borowsky et al. (2004) found that Positive Parenting
21
22 intervention had a significant effect on parent-reported aggressive behavior for boys (adjusted
23
24 difference: -2.75; 95% confidence interval [CI]: -1.21 to -4.29; $P < .001$) but not for girls
25
26 (adjusted difference: -0.23; 95% CI: -2.08 to 1.62; $P = .80$).
27
28

29
30 Conflicting results were reported with regards to parents' level of education or literacy.
31
32 While Cates et al. (2016) found no moderating effects of parent literacy level (9th grader or
33
34 higher literacy, $p=.11$), Mendelsohn et al. (2011b) found that mothers with a literacy level of 9th
35
36 or higher in VIP group showed an increase in total StimQ score (ES, 0.68) as well as in all other
37
38 subscales (ES, 0.36 to 0.72). On the other hand, Mothers with a less than 9th grade literacy level
39
40 showed a statistically significant increase only related to provision of toys in BB group. In an
41
42 earlier study of the same author (Mendelsohn et al., 2007), maternal education had no
43
44 moderating effects on primary outcomes (parent or child behavior).
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49 Two studies examined the moderating effects of families' psychosocial risk (Cates et al.,
50
51 2016; Weisleder et al., 2016). In both studies, psychosocial risk was determined by mother's
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53 endorsement of at least one of the following: being a victim of violence, homelessness, CPS
54
55 involvement, significant financial hardship, food insecurity, smoking or alcohol use during
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4 pregnancy, or history of previous mental illness. Cates et al. (2016) found no moderating effects
5
6 of social risk on parental stress ($p=.51$). On the other hand, in the study of Weisleder et al.
7
8 (2016), VIP effects on the entire sample did not reach significance while VIP children from the
9
10 families with increased psychosocial risk did show a significantly lower aggression (ES: 0.48; P
11
12 $< .05$) than the control group.
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15 16 **Risk of Bias Assessment Within Studies**

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18 Most of the included studies utilized adequate methods of generating random sequence such
19
20 as the use of software or tossing a coin. Several studies did not provide details regarding how the
21
22 random sequences were generated, and therefore, were rated as unclear. Regarding the blinding,
23
24 although the majority of studies blinded study personnel to the group assignment, in most studies
25
26 participants were known to their allocation. Although this is commonly found in behavioral
27
28 intervention studies, unblinding of study participants creates the issue of performance bias;
29
30 therefore, the risk of bias for these studies were rated as high. In most of the studies, outcome
31
32 assessors were blinded to participants' group assignment, reducing the issue of detection bias.
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37 Although the majority of the included studies used an intent-to-treat analysis, some studies
38
39 with a small sample size and substantial loss of participants at follow-up were downgraded due
40
41 to incomplete reporting. All studies but one clearly specified outcomes of interest in the methods
42
43 section and reported all outcomes including non-significant results as intended. The results of
44
45 risk of bias assessment within and across the included studies are summarized in Figures 2 and 3,
46
47 respectively. [Insert Figure 2 Here][Insert Figure 3 Here]
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50 51 **Confidence in Cumulative Estimates**

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53 All studies but two utilized relatively rigorous Randomized Control Trial (RCT) designs. The
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55 risk of bias assessment indicated that 60%-93% of the studies were rated as having a low risk in
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4 all domains except the blinding of participants and personnel, in which over 73% of the included
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6 studies were rated as having a high risk of performance bias. Considering that unblinding of
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8 participants is a common practice in the studies of psychosocial interventions due to the ethical
9
10 responsibilities of researchers, one can conclude that the quality of body of evidence reported in
11
12 this review is not seriously influenced by systematic biases.
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16 Heterogeneity of the intervention types, dosage, outcome measures, and methods of
17
18 adjustment for various demographic variables create challenges in interpreting results. Subgroup
19
20 analysis was conducted in a limited number of studies, and generalization is limited since most
21
22 studies enrolled low income, ethnic and racial minority populations.
23
24

25 Disproportionate representation of low-income, minority participants negatively affects the
26
27 directness of evidence as well. Directness refers to “the extent to which the people, interventions,
28
29 and outcome measures are similar to those of interest” (Grade Working Group, 2004, p. 1491).
30
31 Given the expected nature of primary care-based parenting interventions as universal
32
33 interventions, findings from the studies included in this review may not be directly applicable to
34
35 the original population of interests. However, the reviewers used very specific exclusion criteria
36
37 in selecting studies of parenting interventions to ensure the interventions examined were directly
38
39 applicable to the research question. For example, interventions where the parenting intervention
40
41 makes up only a minor programmatic component, such as interventions provided through home
42
43 visits or interventions that contain other components that could influence the outcomes of
44
45 interest (such as parent support groups and marital counseling) were not included in the review.
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48 In several studies, outcomes were compared between intervention and contrast groups instead of
49
50 a true control group, which should also be considered in interpreting the results.
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4 Despite the effort to collect unpublished manuscripts, all studies that met the inclusion
5 criteria were studies published in peer reviewed journals, which may raise the issue of
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7 publication bias. However, all studies but one reported outcomes specified in the purpose
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9 statement and method section, and therefore, were rated low risk in selective reporting bias.
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13 Discussion

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15 The purpose of this systematic review was to examine the types of parenting
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17 interventions that have been developed and implemented in primary care and to generate overall
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19 knowledge of the effectiveness of primary care-based parenting interventions in light of
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21 implementation factors.
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24 Theories of Change

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26 Of particular interest to this review were the theories of change underlying each parenting
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28 intervention delivered in primary care. The majority of interventions were based on attachment
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30 and social learning theories, and each provided a conceptual foundation for intervention
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32 components seeking to enhance positive parent-child intervention and effective behavior
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34 management, respectively. Attachment and social learning based parenting interventions have
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36 been implemented in a wide range of human services fields over the past 60 years, and have
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38 accumulated a solid body of evidence that supports their benefits (Barth & Liggett-Creel, 2014;
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40 Shaffer et al., 2001). It is encouraging that many practice settings are choosing to adopt
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42 evidence-based interventions based on theories of change, although no systematic differences
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44 were found based on the existence of a theoretical basis or lack thereof.
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50 The findings may support the idea of the common component approach in parenting
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52 interventions suggested by Barth and Liggett-Creel (2014). The common component approach
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54 advocates the development and implementation of parenting interventions that incorporate
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4 components that are common across existing evidence-based parenting interventions, which are
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6 essential to produce desired outcomes. Certainly, the effort to secure resources required to adopt
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8 high quality parenting interventions with strong evidence into primary care should be continued.
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11 At the same time, the common component approach could provide alternative routes to introduce
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13 behavioral parenting interventions into local primary care practices with limited resources.
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16 Future studies should examine essential components that are specific to the universal or early
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18 intervention parenting programs in primary care. A good place to start is to examine the
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20 components that enhance the mediating variables shown to influence the intervention effects
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22 such as responsive parenting (Berkule et al., 2014; Canfield et al., 2015) or positive parent-child
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24 interaction (Mendelsohn et al., 2011a) as summarized in the current paper.
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28 Another important insight is generated by examining theories of change underlying primary
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30 care-based parenting interventions. Many evidence-based parenting interventions were originally
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32 developed to address a child's behavioral issues of clinical intensity, which inevitably places the
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34 emphasis on child well-being with limited attention paid to parent well-being. Theories of
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36 parenting endorse the idea of parenting as a multidimensional concept, recognizing multiple
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38 determinants of parenting behaviors rooted in the contextual environment (Belsky, 1984). The
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40 mediator analysis conducted in the studies reviewed showed that parent well-being measures
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42 such as parental depression and parenting stress not only mediated the relationship between
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44 intervention and physical punishment but also had a direct positive association with physical
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46 punishment (Canfield et al., 2015).
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51 Given the focus of universal, primary care-based parenting interventions on prevention, it is
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53 worth exploring the possibility of incorporating intervention components targeting various
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55 dimensions of parental well-being. These effects could be assessed through measures of
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proximal or intermediate outcomes, which have a demonstrated link with distal outcomes such as maltreatment or problem behaviors of children. Additionally, parenting interventions seeking to improve parental well-being may increase our ability to detect intervention effects that are small in magnitude but meaningful in the context of universal parenting interventions.

The Effectiveness of Primary Care-Based Parenting Interventions

Drawing conclusive knowledge of overall effectiveness of primary care-based parenting interventions was challenging due to the heterogeneity of the intervention types, delivery format, dosage, and the fidelity measures used. Despite the decreased dosage of interventions, several interventions demonstrated significant or non-significant but positive effects on various parent and child behavior outcomes both at posttest and follow-up, which suggest that low-dosage adapted forms of evidence-based parenting interventions delivered in primary care may have lasting positive effects in parent as well as child outcome domains.

On the other hand, no positive effects on child behavioral outcomes were found in PriCARE although the intervention dosage was actually increased from a 6-hour two-day training to six weekly 90-min group sessions (Schilling et al., 2016). The original intervention, CARE, was developed to prevent childhood trauma and maltreatment by enhancing adults' ability to positively interact with children in an agency setting rather than to address intensive behavioral problems in children (Gurwitch et al., 2016). Thus, limited PriCARE effects shown in child behavioral outcomes could be attributed to the original goal of intervention, which is to educate ordinary adults who interact with children with or without clinical issues while, PCIT and IY, which showed positive effects in a wider range of child behavioral outcomes, were developed with a specific focus on treating intensive behavioral issues.

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4 When an adaptation process involves a shift of focus or goals, careful consideration needs to
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6 be given with regard to (a) the theories of change built into the original interventions; (b)
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8 essential components intended to produce desired outcomes based on the theories of change; and
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10 (c) the types of outcomes that can accurately reflect intervention effects. However, limited
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12 details were provided in the studies reviewed with regard to the processes that may have been
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14 involved in shifting the intervention focus from a targeted to a universal population.
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16 Consideration of these topics will better guide the process of developing knowledge of the
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18 effectiveness of primary care-based parenting interventions.
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23 In addition to the dosage and intervention goals, other implementation factors such as
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25 delivery format, providers, and fidelity measures may also affect the effectiveness of an
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27 intervention. For example, unlike other adapted parenting interventions, *ezParent* program
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29 showed no intervention effects on parent self-efficacy, parental follow-through, corporal
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31 punishment, and parenting stress, and child behaviors at post-test as well as at 6-month follow-up
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33 except on parental warmth at 6-month follow-up. As the authors noted, the results could be
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35 attributed to a small sample size, floor effects, and the limited time for parents to absorb
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37 intervention effects. However, it is also important to note that *ezParent* program was a parent
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39 self-guided program without extensive fidelity measures while the other three interventions that
40
41 showed positive effects required weekly in-person contact with licensed therapists and live skills
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43 training components. Although no intervention effects were shown on outcome domains,
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45 *ezParent* showed high completion and satisfaction rates among parent participants, perhaps due
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47 to brevity and the use of media. Thus, an important next step to advance the field is to determine
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49 the appropriate level of dosage and resource input that is acceptable to participants and providers
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51 while producing meaningful effects.
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4 The fidelity measures utilized by the adapted programs (e.g., PC-PCIT, PriCARE, IY)
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6 required intensive resources such as documentation and videotaping of each session, review of
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8 the cases with experienced therapists who have expertise in each intervention during weekly
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10 supervisions, and reliability checks by research assistants. While fidelity measures are important,
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12 the resource intensive nature of such efforts might create challenges in sustaining interventions
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14 in primary care settings with limited resources. Additionally, these interventions were provided
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16 by licensed clinicians or other mental health professionals with required training. Although
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18 benefits could be substantial, co-location of behavioral health services requires substantial
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20 restructuring at the organizational level as well as the payment system to ensure sustainability.
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22 As demonstrated in the study of Perrin et al. (2014), which described The Incredible Years
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24 program being co-led by research clinicians and a pediatric staff member (e.g., a nurse, a nurse
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26 practitioner, social worker or a pediatrician), alternative strategies may present an opportunity to
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28 utilize existing human resources in primary care along with external expert support. Such efforts
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30 should be pursued at the same time while seeking changes at the organizational and policy level
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32 to build infrastructure and funding mechanisms necessary to sustain behavioral parenting
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34 interventions in primary care.
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41 Other alternatives to adapting existing parenting interventions that are evidence-based were
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43 seen in interventions such as VIP, BB, and Play Nicely, which were originally developed to be
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45 delivered in primary care. These interventions were either provided by an interventionist with a
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47 bachelor's degree and experience in working with children (VIP) or were parent self-guided
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49 interventions using written materials or interactive media instead of using licensed therapists (BB
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51 and Play Nicely, respectively). Though these interventions utilized fewer resources compared to
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53 primary care-adapted evidence-based parenting interventions, still demonstrated positive effects
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4 across multiple parent domains, including maternal depression, physical punishment, parenting
5 stress, and parent-child interaction. The results may support that a primary care developed brief
6 parenting intervention could represent an alternative to more intensive and costly evidence-based
7 parenting interventions for organizations with limited resources. However, a consideration needs
8 to be made with regard to the types of interventions that can best achieve the goals that specific
9 to the organizational context.
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18 Additionally, the results from this review suggest that low dosage-interventions with handouts
19 could also produce small but positive effects, though interventions that require in-person
20 participation seem to be superior to written interventions. Therefore, a written intervention could
21 be considered a supplementary option to augment in-person interventions or as an independent
22 intervention in the clinic settings where the implementation of an in-person intervention is not a
23 feasible option. Though the magnitude of the effects could be small, repeated intervention
24 exposure, possibly through integrated delivery into well-child care, may augment the
25 intervention effects, which warrant further studies.
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Directions for Future Research

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39 The success of the effort to integrate behavioral parenting interventions into primary care will
40 depend on multiple factors including core leadership involvement and the availability of
41 resources to attain adequate training and ongoing consultation from trusted sources. Thus,
42 implementation science can provide important pieces of information for future efforts to
43 integrate psychosocial interventions with the least disruption in routine primary care by
44 identifying facilitators and barriers to efficient delivery and maintenance of parenting
45 interventions in primary care.
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Another area of future research is to generate insights into the task of reconciling the two conflicting goals of high intervention fidelity and sustainability. This can be achieved through an increased number of pilot studies examining various types of interventions delivered through a variety of formats. Such efforts may foster innovations among organizational leaders, community members, and researchers to develop interventions with the universal and preventive goals that are suitable in the context of primary care. Increased number of studies will also contribute to the accumulation of a body of evidence that can be synthesized through quantitative analyses and subgroup analyses to generate more conclusive knowledge of the overall effectiveness of primary care-based parenting interventions to guide the decision-making processes of practice settings. Future studies should also seek to increase the generalizability of their findings by engaging geographically and socioeconomically diverse populations.

Limitations

This review was limited to the studies published in the U.S. Although the decision was made intentionally with the awareness that outcomes are likely to be influenced by the organizational and policy context specific to healthcare practices in the U.S., a high volume of relevant studies might have been excluded, given that many evidence-based parenting interventions have been originally developed in international locations. Additionally, studies examined in this review were mostly conducted in urban primary care practices serving a large number of low income, ethnic minority parents, and therefore, may not accurately capture intervention effects on prevention, targeting all parents at the population level as intended.

Another important limitation of this study is that although the study was inspired by maltreatment prevention efforts, many of the outcomes examined in the systematic review are not direct indicators of maltreatment. Some of the parenting outcomes included in this study such

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4 as corporal punishment and maltreatment risk are more closely associated with maltreatment
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6 outcomes. On the other hand, other outcomes such as parental stress and maternal depression are
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8 known to be associated with an increased risk for maltreatment as indirect indicators. Further
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10 studies are needed to better understand the effects of preventive behavioral parenting
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12 interventions delivered in primary care on maltreatment prevention efforts. Other types of
13
14 primary care-based interventions such as the Safe Environment for Every Kid (SEEK) model
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16 (Dubowitz, H., 2014) have demonstrated direct effects on decreasing maltreatment through
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18 randomized controlled trials as indicated by fewer number of abuse and neglect cases reported on
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20 medical records and child protective services (CPS) reports (Dubowitz, Feigelman, Lane & Kim,
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22 2009). Considering that the SEEK model targets more comprehensive family psychosocial risks
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24 such as parental depression, substance abuse, food insecurity, and more, a longitudinal analysis
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26 may be necessary to detect similar impact on maltreatment for interventions focused on
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28 parenting practice only.
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Conclusions

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36 The topic of primary care-based parenting interventions is gaining new momentum due to
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38 changes in the sociopolitical context in the U.S. (Leslie et al., 2016). The increased awareness of
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40 the impact of adverse childhood experiences on long-term health outcomes, the advancement of
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42 prevention science, increased emphasis on integrative health care, and an accumulated body of
43
44 evidence that supports the benefits of behavioral parenting interventions have all opened a new
45
46 window of opportunity to advance the old idea of integrating parenting interventions into
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48 primary care in a new fashion. Further studies will contribute to the effort to take full advantage
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50 of this new window of opportunity to produce sustainable changes in primary healthcare systems.
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THE EFFECTS OF PRIMARY CARE

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1 Table 1.
2 *Intervention Characteristics.*

3 Intervention	Studies	Program goals	Core contents	Components	Theories of change	Age	Format	Delivery
4 Play Nicely: 5 The Healthy 6 Discipline 7 Program	Sholer 2011, Aragon 2013, Chavis 2013	To reduce child's exposure to violence in media	The adverse effects of exposure to violence in the media, recommendation to limit media to 1 to 2 hours per day and not placing a TV in children's bedroom.	Online interactive multimedia accompanying handbook that can be downloaded for free	Developmental framework, intergenerational cycle that links parenting skills, childhood aggression, child maltreatment, academic failure, and violence	2-12	Individual	CD rom or Web
12 Primary Care 13 Parent-Child 14 Interaction 15 Therapy (PC- 16 PCIT)	Berkovits 2010	To establish an authoritative parenting style	Child-directed interaction (CDI): enhancing parent-child attachment, positive parenting, and child social skills / parent- directed interaction (PDI): the use of clear directives, consistent follow through to reduce child noncompliance, aggression, and other behavior problems Same as above	Weekly sessions, Handouts, Parenting tip sheet, call-in time to ask questions or address challenges	Baumrind's (1967, 1991) developmental research associating			

Table 2 Parent Outcomes

	DVs	Study Info	Intervention	Measures	Informant	Post Tx Results	Follow-Up Results
Knowledge	Knowledge gain in child development	Chamberlin 1979	Parent Education	Author	Parent	12-month: NS	18-month: S more [LD: -0.52, MD: 0.32, HD: 0.46, (p=.026)]
		Chamberlin 1980	Parent Education	Author	Parent	N/A	24-month: S more [LD: 35.1, MD: 35.4, HD: 36.5, r ² =0.02, p = .00]
	Parenting locus of control	Berkovits 2010	PC-PCIT	PLOC-SF	Parent	S decrease pre/post, NS btw group	6-month: NS compared to post S lower than pre
Attitudes	Parent Self Efficacy	Breitenstein 2016	ezParent	Toddler Care Questionnaire	Parent	3-month: NS.	6-month: NS
	Difficulty in childrearing	Chamberlin 1979	Parent Education	Author	Parent	12-month: Not reported	19-month: NS
		Chamberlin 1980	Parent Education	Author	Parent	N/A	24-month: NS
Monitoring	Media viewing habits	Aragon 2013	Play Nicely	Author	Parent	S higher change. [PN: 46.2%, OR 3.29, P < .001; AAP: 53.2%, OR 4.35, P < .001; control: 38.2%, OR 2.37, P = .018]	N/A
	Exposure to media violence	Aragon 2013	Play Nicely	Author	Parent	S higher change (PN: 38.5%, OR 4.26, P < .001; AAP: 32.9%, OR 3.35, P = .003).	N/A
	Infant media exposure	Mendelsohn 2011A	VIP	Author	Parent	NS but lower (p=.006)	N/A
	Parental Monitoring	Borowsky 2004	Violence Prevention	Parent Monitoring	Parent Youth	NS	N/A
	Positive Parenting skills	Borowsky 2004	Violence Prevention	PSCQ	Parent	9-month: NS	N/A
Parenting practice	Parenting Practice	Mendelsohn 2007	VIP	Author	Youth Parent	NS	N/A
	Parenting skills	Schilling 2016	PriCARE	AAP12	Parent	33-month: S higher in parental involvement (p=.003). NS in all other and total Wk 9: S empathy (P=.04), corporal punishment (.009), power/independence (.003).	N/A
	Parental follow through	Breitenstein 2016	ezParent	Parenting Questionnaire	Parent	3-month: NS	6 Month: NS
	Plan to change discipline strategy	Scholer 2011	Play Nicely	Author	Parent	G1: 4% / G2:13% / G4: 89% {G2[OR 4.93 / CI, 1.08-22.46]}, G3[259.29; 56.56-1188.61], G4 [507.05; 86.81-2961.45]}	N/A
Interaction	Parental Warmth	Breitenstein 2016	ezParent	Parenting Questionnaire	Parent	3-month: NS	6-month: S difference, Cohen's <i>d</i> = 0.31
	Mother reported number of conflicts	Chamberlin 1979	Parent education	Author	Parent	12-month: Not reported	18-month: NS
		Chamberlin 1980	Parent education	Author	Parent	N/A	24-month: NS
	Positive parent-child contact	Chamberlin 1979	Parent education	Author	Parent	12-month: HD S more likely to participate in interactive activities with child (p = .028)	18-month: NS
	Chamerlin 1980	Parent education	Author	Parent	N/A	24-month: NS (Main effect)	

Table 3 Child Behavior Outcomes

DVs	Study Info	Intervention	Measures	Informant	Analysis	Post Tx Results	Follow-Up Results
Child behavior	Berkovits 2010	PC-PCIT	ECBI-Intensity	Parent	ANOVA 2 (Group) ×3 (Time)	S main effect for Time, $F(2,19)=12.54, p < .001, f=1.17$, NS Time × Condition, NS between-subjects effect	
	Breitenstein 2016	ezParent	ECBI-Intensity	Parent	ANOVA	NS.	NS.
	Perrin 2014 (Random)	Incredible Years	ECBI-Intensity	Parent	AMD & CI	S low behavioral intensity. [AMD: -0.40, CI: -0.76 to -0.04, $p < .05$]	S low in behavioral intensity [6-month: AMD: -0.36, CI: -0.72 to -0.001, $p < .05$, 12-month: AMD: -0.43, CI: -0.79 to -0.07, $p < .05$]
	Perrin 2014 (Non-random)	Incredible Years	ECBI-Intensity	Parent	AMD & CI	S low behavioral intensity [AMD: -0.59, CI: -0.95 to -0.23, $p < .05$]	S low in behavioral intensity [6-month: AMD: -0.69, CI: -1.05 to -0.32, $p < .05$, 12-month: AMD: -0.56, CI: -0.92 to -0.20, $p < .05$]
	Schilling 2016	PriCARE	ECBI-Intensity	Parent	Linear regression	larger decrease from week 0 to week: -22 (-29, -16) vs -7(-17, 2), $P = .012$;	
	Breitenstein 2016	ezParent	ECBI-Problem	Parent	ANOVA	NS.	NS.
	Perrin 2014 (Random)	Incredible Years	ECBI-Problem	Parent	Adjusted mean differences and CI	S low scores in behavioral frequency [AMD: -0.46, CI: -0.82 to -0.10, $p < .05$]	S low behavioral frequency [6-month: AMD: -0.43, CI: -0.79 to -0.07, $p < .05$, 12-month: AMD: -0.59, CI: -0.95 to -0.23, $p < .05$]
	Perrin 2014 (Non-random)	Incredible Years	ECBI-Problem	Parent	Adjusted mean differences and CI	S low behavioral frequency [AMD: -0.53, CI: -0.89 to -0.16, $p < .05$]	S low scores behavioral frequency [6-month: AMD: -0.54, CI: -0.91 to -0.18, $p < .05$, 12-month: AMD: -0.39, CI: -0.75 to -0.03, $p < .05$]
	Schilling 2016	PriCARE	ECBI-Problem	Parent	Linear regression	NS, but greater decrease from week 0 to week 16: -5(-7, -4) vs -2(-4, 0), $P = .014$. NS between 6 and 16 weeks, NS in clinical significant ECBI scores.	
Externalizing behavior	Weisleder 2016	VIP	ITSEA-Externalizing	Parent	T test	N/A	36-month: significantly low ($p = .02$)
Disruptive behavior	Perrin 2014 (Randomize)	Incredible Years	CII	Analysis of videotaped session	AMD & CI	No significance test. IY group lower [AMD: -0.43, CI: -0.79 to -0.06]	12-month: No significance test. IY group lower [AMD: -0.15, CI: -0.51 to -0.21]
	Perrin 2014 (Non-randomized)	Incredible Years	CII	Analysis of videotaped session	AMD & CI	No significance test. IY group lower [AMD: -0.13, CI: -0.49 to -0.23]	12-month: No significance test. IY group lower [AMD: -0.12, CI: -0.48 to -0.24]
	Chamberlin 1979	Parent education	Author	Parent	ANCOVA	12-month: Not reported	18-month: HD significantly higher problem behaviors ($p=.019$)
	Chamberlin 1980	Parent education	Author	Parent	ANCOVA	N/A	24-month: Main effect ($r^2=0.02, p = 0.3$) High dose intervention mothers more likely to report child problem behaviors
Clinical behavior	Schilling 2016	PriCARE	ECBI	Parent	Chi-square	NS	

	DVs	Study Info	Intervention	Measures	Informant	Analysis	Post Tx Results	Follow-Up Results
1	Socioemotional	Mendelsohn	VIP	CBCL	Parent	T test	33-month: NS	N/A
2	behavior	2007						
3	# of behavioral	Chamberlin	Parent	Author	Parent	ANCOVA	12-month: Not reported	18-month: NS
4	concerns	1979	education					
5		Chamberlin	Parent	Author	Parent	ANCOVA	N/A	24-month: NS
6		1980	education					
7	Aggression	Borowsky	Violence	CBCL-	Parent	GLM	S lower [AMD: -1.71, CI:- 2.89 to -0.53, p	N/A
8		2004	prevention	Problem			= .005]	
9				Achenbach	Youth	GLM	NS	N/A
10				-Problem				
11		Weisleder	VIP	ITSEA-	Parent	T-test	N/A	36-month: NS
12		2016		aggression	interview			
13	Bullying	Borowsky	Violence	Author	Parent	Logistic	S [AOR: 4.43, CI, 1.87 to 10.52, p < .001]	N/A
14		2004	prevention			regression		
15				Author	Youth	Logistic	NS	N/A
16						regression		
17	Physical fight	Borowsky	Violence	Author	Parent	Logistic	S [AOR: 1.79, CI: 1.11 to 2.87, p = .02]	N/A
18		2004	prevention			regression		
19				Author	Youth	Logistic	NS	N/A
20						regression		
21	Delinquency	Borowsky	Violence	CBCL-	Parent	GLM	S [AMD: -0.71, CI: -1.28 to -0.13, p = .02]	N/A
22		2004	prevention	Problem				
23				Achenbach	Youth	GLM	NS	N/A
24				-Problem				
25	Attention	Borowsky	Violence	CBCL-	Parent	GLM	S [AMD: -1.02, CI:-1.77 to -0.26, p = .009]	N/A
26		2004	Prevention	Problem				
27				Achenbach	Youth	GLM	NS	N/A
28				-Problem				
29		Weisleder	VIP	ITSEA-	Parent	ANOVA	14-month: NS	24-month: S higher (ES: 0.30; P < .05)
30		2016		attention	interview			36-month: NS
31	Hyperactivity	Weisleder	VIP	ITSEA-	Parent	T-test	N/A	36-month: S lower (p=.02)
32		2016		hyperactivi	interview			
33				ty				
34	Anxiety/Depre	Borowsky	Violence	CBCL-	Parent	GLM	NS but favored the intervention group	N/A
35	ssion	2004	prevention	Problem				
36				Achenbach	Youth	GLM	NS	N/A
37				-Problem				
38	Separation	Weisleder	VIP	separation	Parent	ANOVA	14-month: NS	24-month: NS, 36-month: Not collected
39	distress	2016		distress	interview	T test		
40	Social skills	Weisleder	VIP	ITSEA-	Parent	ANOVA	14-month: S higher than BB (p < .01,	24-month: NS
41		2016		imitation	interview	T test	d=0.49) but NS compare to control	36-month: NS
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Table 4 *Critical Findings*

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6	<ul style="list-style-type: none"> • Most studies of primary care-based parenting interventions have been conducted in urban primary care facilities mainly enrolling low-income ethnic and racial minority participants.
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8	<ul style="list-style-type: none"> • Primary care-based parenting interventions vary with regard to the types, dosages, and delivery formats. Some require weekly in-person attendance while others are parent self-guided interventions that can be completed online or using electronic devices.
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11	<ul style="list-style-type: none"> • Many primary care-based parenting interventions have been adapted from interventions originally targeting parents of children with behavioral and emotional disorders. No consistent outcome differences were found between these interventions and interventions developed specifically to be delivered in primary care settings.
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16	<ul style="list-style-type: none"> • Primary care-based parenting interventions have been developed mainly based on attachment theory, social learning theory, and coercion theory. Interventions that are not based on explicit theories of change also contain components commonly found across various evidence-based parenting interventions.
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21	<ul style="list-style-type: none"> • Primary care-based parenting interventions can be effective in enhancing parenting knowledge, locus of control, monitoring, positive parent-child interactions, and in reducing negative discipline strategies.
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23	<ul style="list-style-type: none"> • The effects of primary care-based parenting interventions on child behavior outcomes are inconsistent across studies.
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26	<ul style="list-style-type: none"> • The effects of primary care-based parenting interventions can be moderated by child gender, age, maternal literacy and depression as well as by family psychosocial risk although the inconsistent results across studies create challenges in drawing conclusive knowledge.
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29	<ul style="list-style-type: none"> • A limited number of studies paid attention to the process of adapting, installing, implementing behavioral parenting interventions into the specific organizational context of primary care.
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Table 5 *Implications for Policy, Practice, and Research*

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35	<ul style="list-style-type: none"> • Primary care-based parenting interventions have the potential to make positive contributions to the effort to prevent maltreatment and promote family well-being at the population level. Healthcare leaders and policymakers should be informed of latest developments in the field to maximize the utility of primary care in preventing family violence.
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40	<ul style="list-style-type: none"> • Primary care practices seeking to adopt innovation through the integration of behavioral parenting interventions into routine care should consider various options available and select interventions that best fit their specific organizational context.
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44	<ul style="list-style-type: none"> • Implementation science can provide important insights into the process of developing and delivering primary care-based parenting interventions. More studies are needed to further advance the knowledge of facilitators and barriers in integrating behavioral parenting interventions into primary care.
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48	<ul style="list-style-type: none"> • Future studies should explore the goals and underlying theories of change that are the most suitable and attainable in the context of primary care considering the universal nature of such interventions delivered in primary care.
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52	<ul style="list-style-type: none"> • Future studies should seek to increase the generalizability of their findings by engaging geographically and socioeconomically diverse populations to maximize the value of primary care as a platform to deliver universal parenting interventions.
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Figure 1
PRISMA 2009 FLOW DIAGRAM

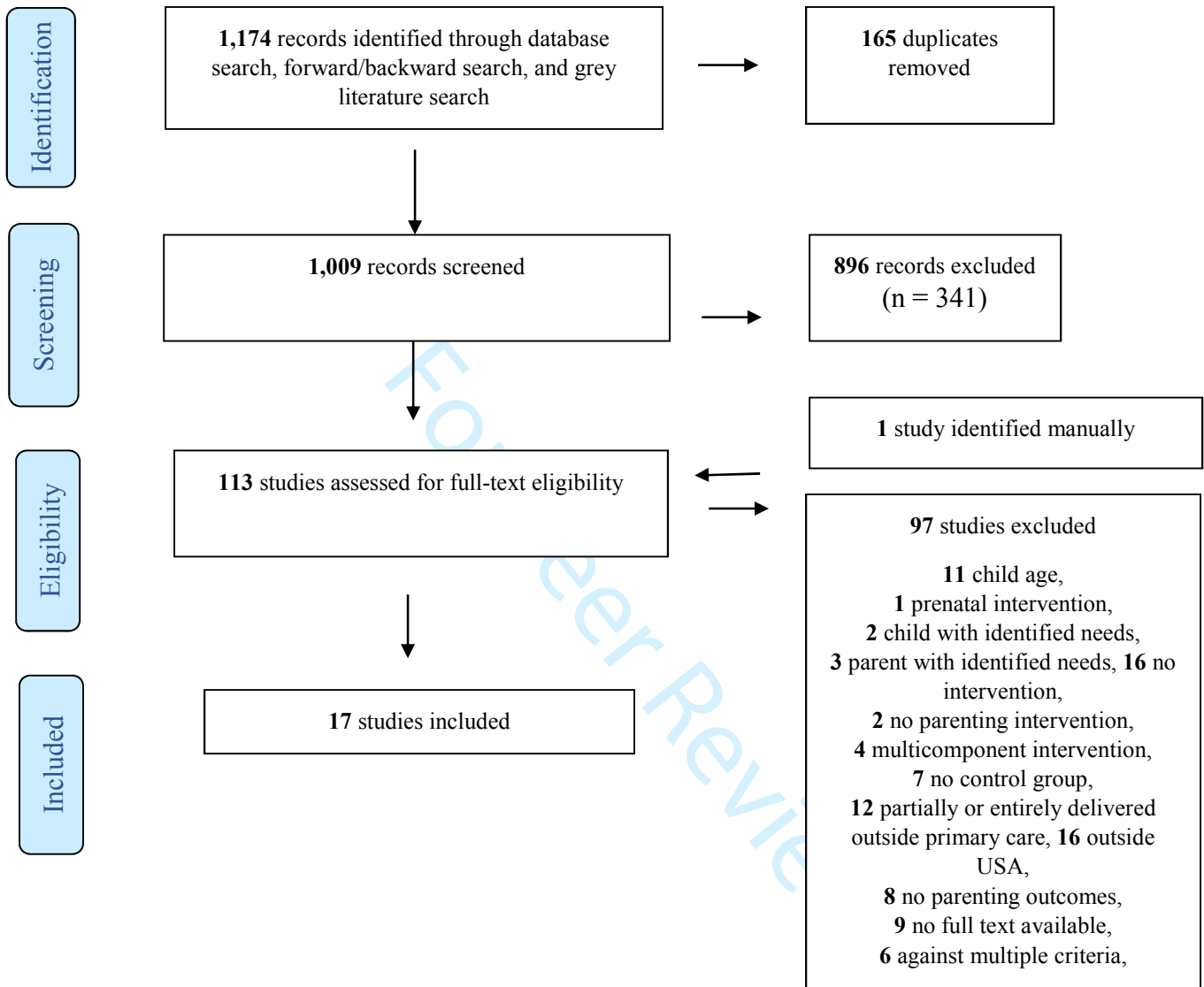


Figure 2
*Risk of Bias Assessment of
 Randomized Control Trial Studies*

Study Info	Random sequence generation	Allocation concealment	Blinding of personnel and participant	Blinding of outcome assessment	Incomplete measurement	Selective reporting	Other Bias
Aragon 2013	?	L	H	L	H	L	L
Berkovits 2010	?	?	?	?	H	L	H
Berkule 2014	L	L	H	L	H	L	L
Borrowsky 2004	?	?	H	L	L	L	H
Breitenstein 2016	L	H	H	?	L	L	H
Canfield 2015	?	?	H	L	H	L	L
Cates 2016	L	L	H	L	L	L	L
Chavis 2013	?	L	L	L	L	L	L
Mendelsohn 2011-P	L	L	H	L	L	L	L
Mendelsohn 2011-R	L	L	H	L	L	L	L
Mendelsohn 2007	L	?	H	L	L	L	L
Perrin 2014	L	?	?	L	L	L	L
Schilling 2016	L	L	H	L	L	?	L
Scholer 2011	?	L	L	H	L	L	L
Weisleder 2016	L	L	H	?	L	L	L

Figure 3
*Risk of Bias Assessment of
 Randomized Control Trials (Across studies)*

