



Parental and Familial Predictors and Moderators of Parent Management Treatment Programs for Conduct Problems in Youth

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Abstract

Despite the established efficacy of Parent Management Training (PMT) for conduct problems in youth, evidence suggests that up to half of all treated youth still display clinical levels of disruptive behavior post-treatment. The reasons for these unsatisfactory outcomes are poorly understood. The aim of the present review was to provide an updated analysis of studies from the past 15 years that examined parental and familial predictors and moderators of improvement in PMT for conduct problems. A systematic literature review of indicated prevention (children with conduct problem symptoms) and intervention (children with clinical diagnoses) studies published between 2004 and 2019 was conducted. This 15-year time period was examined since the last systematic reviews were reported in 2006 and summarized studies completed through mid-2004 (see Lundahl et al. in *Clin Psychol Rev* 26(1):86–104, 2006; Reyno and McGrath in *J Child Psychol Psychiatry* 47(1):99–111, 2006). Risk of bias indices was also computed (see Higgins et al. in Revised Cochrane risk of bias tool for randomized trials (RoB 2.0), University of Bristol, Bristol, 2016) in our review. A total of 21 studies met inclusion criteria. Results indicated that a positive parent–child relationship was most strongly associated with better outcomes; however, little additional consistency in findings was evident. Future PMT research should routinely examine predictors and moderators that are both conceptually and empirically associated with treatment outcomes. This would further our understanding of factors that are associated with poorer treatment outcome and inform the development of treatment components or modes of delivery that might likely enhance evidence-based treatments and our clinical science. Protocol Registration Number: PROSPERO CRD42017058996.

Keywords Parent management training · Predictors · Moderators · Child conduct problems

Persistent conduct problems (CP) in childhood have been associated with a variety of negative outcomes in

adolescence and adulthood, including poor academic achievement, school dropout during adolescence, drug abuse, juvenile delinquency and depression (Colder et al. 2013; Jerrell et al. 2015; Kim-Cohen et al. 2003; Moffitt and Caspi 2001; Merikangas et al. 2009; Murrihy et al. 2010; Stringaris et al. 2014; Tanner-Smith et al. 2013). The impairments associated with CPs represent the most common reason that families seek help in primary care and hospital settings (see Merikangas et al. 2009, for a review). Left untreated, these symptoms account for a significant cost at both the personal, societal, and economic level (Beecham 2014; Christenson et al. 2016; Kim-Cohen et al. 2003; Merikangas et al. 2009).

Conduct problems consist of disruptive behaviors that can range from relatively mild behaviors, such as temper tantrums and minor defiance, to more severe behaviors that violate societal rules, such as stealing, destruction of property, and physical aggression (Murrihy et al. 2010). Children with

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persistent CPs typically meet the Diagnostic and Statistical Manual (DSM-IV, DSM-5; American Psychiatric Association 1994, 2013) criteria for oppositional defiant disorder (ODD) or conduct disorder (CD). Oppositional defiant disorder refers to a recurrent pattern of angry/irritable mood and inappropriate levels of defiance, aggression and vindictiveness toward authority figures. Conduct disorder includes more severe antisocial and aggressive behaviors that involve serious violations of others' rights or their property. Hereafter, the range of conduct problems present in ODD and CD will be referred to as CPs. Due to the high costs of CPs at an individual, family, and societal level, investigating ways to effectively intervene has received much attention.

Parent Management Training (PMT) in its various forms and formats is based on operant conditioning principles and social learning theory (Brainerd and Kazdin 2005) and is one of the most widely used interventions for CPs (Eyberg et al. 2008; Murrihy et al. 2010). In essence, these models describe how behavior is learned and modified by reinforcement and punishment processes and that child behavior problems develop, are maintained by, and/or exacerbated in the context of the parent–child relationship (Kaehler et al. 2016). Furthermore, it is hypothesized that teaching parents the principles of behavioral management will result in effective, sustainable changes in child behavior (Danforth, 1998). A major premise of PMT is that ineffective parenting practices, such as harsh and inconsistent discipline, contribute to the origins and course of oppositional behavior in youth and, therefore, changing problematic parenting practices is the primary focus of intervention. In practice, PMT typically includes strategies aimed at helping parents be more consistent and contingent in their responses by using clear and direct commands, differential attention, contingent reinforcement, response cost, and time-out from reinforcement. Another focus of treatment is improving the parent–child relationship and encouraging positive involvement and communication between the parent and the child. Representative PMT programs include: the COMET program (Kling et al. 2010); The Defiant Child (Barkley 2013); Helping the Non-Compliant Child (HNC; McMahon and Forehand 2003); the Incredible Years (IY-PT; Webster-Stratton and Reid 2003); Parent–Child Interaction Therapy (PCIT; Brinkmeyer and Eyberg 2003); Parent Management Training Oregon Model (PMTO; Patterson et al. 1975); Integrated Family Intervention for Child Conduct Problems (Dadds and Hawes 2006), and finally, Triple P-Positive Parenting Program (Triple P; Sanders 1999).

PMT is among the most extensively studied and validated treatment for CPs (e.g., Deković and Stoltz 2015; Eyberg et al. 2008; Michelson et al. 2013). These interventions have been shown to produce positive outcomes in both efficacy and effectiveness trials in “real-world” clinical settings, across different cultures, languages and populations

(Menting et al. 2013; Michelson et al. 2013; Webster-Stratton et al. 2012). Limitations are, however, evident in research findings associated with PMT treatment trials. For example, despite the substantial empirical support for PMT treatments of CPs, relatively little is known about factors related to poor treatment response, which is typically seen in one third to one half of treated cases (Murrihy et al. 2010; Reyno and McGrath 2006; Ollendick et al. 2018). More specifically, some studies have shown that while improvements in disruptive behaviors are evident, up to half of treated cases still display clinical levels of disruptive behaviors post-treatment (Ollendick et al. 2016). The attrition rate for this population is also relatively high (approaching 50%, see Nock and Ferriter 2005) and the benefits that are obtained following treatment are not always maintained over time (Lundahl et al. 2006). It is, therefore, important to understand the conditions under which PMT is most effective so that we can tailor interventions to ensure maximum benefits for these youth and their families. To this end, examining moderators and predictors of treatment outcome is vital as they assist in addressing these questions.

Treatment moderators inform “for whom” or under “what conditions” the treatments work (Kraemer et al. 2002). According to Kraemer et al., moderator variables must be pre-randomization characteristics in randomized clinical trials that can be shown to differentially predict treatment outcome. Generally, moderator variables are associated with the interaction effect between the proposed moderator variables and the different treatment conditions (Prins et al. 2015). These pre-treatment moderator variables have been referred to as “prescriptive indicators” (MacKinnon et al. 2013) because they can provide information about whether two treatments differ from one another due to characteristics of the sample or the contexts under which the treatments are delivered. For example, a child of a parent with high levels of depression at pre-treatment may make more gains in an individualized versus group delivered PMT program. Pre-treatment knowledge of moderators enables the clinician to choose the most suitable treatment and to adjust and individualize it whenever possible (Prins et al. 2015).

Predictors also inform us *for whom* treatments work. Kraemer et al. (2002) specify that predictors are generally pre-treatment variables, but can also consist of post-treatment variables (e.g., treatment compliance) that are associated with treatment outcomes irrespective of treatment assignment. These predictor variables have been referred to as “prognostic indicators” (MacKinnon et al. 2013). Generally, predictor variables are associated with the main effects of the candidate variables. For example, a parent participating in treatment for their child’s disruptive behavior may experience poor outcomes if they have high levels of depression at pre-treatment, regardless of what treatment they receive. In contrast, a moderator variable must interact

with treatment assignment to specify for whom a specific treatment works. Importantly, not all predictor variables are moderators of treatment outcome (Kraemer et al. 2002; Ollendick et al. 2008).

Parental and familial characteristics may have a significant impact on treatment outcomes of PMT interventions (e.g., Lundahl et al. 2006; Shelleby and Shaw 2014). Parents play a crucial role in PMT interventions; they are the primary agents of change (Forgatch and Gewirtz 2018), as they shape the child's behavior through the effective implementation of behavior management principles. More specifically, parents are taught skills in how to interact with their child and how to implement the techniques provided to them in treatment with the goal of altering specific child-rearing practices that will lead to decreases in disruptive behaviors (Brainerd and Kazdin 2005). It is therefore of utmost importance that we understand what pre-treatment parental and familial factors impact parents' ability to successfully engage and implement PMT strategies, in order to achieve optimal treatment outcomes.

Unfortunately, to date, relatively few studies have examined parental and familial predictors and moderators of treatment outcome for disruptive behaviors; as a result, Prins et al. (2015) recently described this movement as a "work in progress." Parental and familial characteristics that have most frequently been investigated include maternal depression, maternal stress, socioeconomic status (SES), and marital status (Brainerd and Kazdin 2005; Menting et al. 2013). Less commonly examined characteristics include paternal indices of stress and depression, parental attributions for child misbehavior, parental age, and substance use (Reyno and McGrath 2006; Webster-Stratton 1990; Sawrikar et al. 2018). To date, results have been mixed, with few studies finding significant predictors of treatment outcome (e.g., Baruch et al. 2011; Hartman et al. 2003; Reyno and McGrath 2006), and even fewer reporting significant moderators of treatment outcome (e.g., Lundahl et al. 2006; Shelleby and Shaw 2014). Here, we provide a brief overview of some of the early findings associated with family and parent characteristics, and then examine more recent findings.

Family Characteristics

One of the strongest familial predictors found to influence treatment outcome for CPs in earlier studies was family income (e.g., Dumas 1984; Kazdin 1990; Lundahl et al. 2006; Reyno and McGrath 2006). In a 2006 meta-analysis examining the predictors of treatment outcome for CPs, Reyno and McGrath (2006) found parent training to be less effective for economically disadvantaged families compared to their less disadvantaged counterparts. Similarly, in another early meta-analysis investigating the moderators of

treatment outcome for CPs, Lundahl et al. (2006) found parent training was least effective for economically disadvantaged families and that such families benefited significantly more from individually delivered parent training compared to group delivery.

Parental Characteristics

Maternal psychopathology is a commonly researched parental predictor of parent training outcomes (e.g., Hartman et al. 2003; Kazdin and Wassell 2000; Shaw et al. 2006), with studies once again yielding mixed findings. Children of parents who have higher levels of depressive symptoms have been found not to benefit as much from parent training when compared to children of parents with low levels of depression (Kazdin and Wassell 2000; Reyno and McGrath 2006). However, other studies have found the opposite effect, wherein higher levels of maternal depression have been shown to predict greater improvements in CPs (Shaw et al. 2006).

Mother–child relationship quality as a predictor of treatment outcome has also yielded mixed results in these earlier studies. Some have found the greatest benefits for children whose mothers reported lower mother–child relationship quality (Tein et al. 2004), while others have found no significant effects for mother–child relationship on treatment outcome (Gardner et al. 2009).

With respect to other parental characteristics, some studies have found the greatest benefits for children whose mothers reported low social support, and for children of mothers who reported greater marital discord and daily hassles (Van Zeijl et al. 2006). While others have found parental characteristics including life stress parental age, income/SES, or cumulative risk to either result in poor treatment response or have no impact on treatment outcome (Webster-Stratton, 1990).

Collectively, these studies suggest that the effect of familial and parental characteristics across treatments is not clear, with several moderation and predictor studies reporting non-significant results (see Shelleby and Shaw 2014). The lack of consensus in the literature may be attributed to relatively few studies examining these variables. Others have suggested that variation in these results could be attributed to the different types and delivery modes of parenting programs examined. For example, the collaborative approach of some group programs, such as Incredible Years, may result in the tailoring of strategies to meet the specific characteristics and needs of the families (Leijten et al. 2017). Others argue that for those most disadvantaged, an individualized therapy approach may be of most benefit (Lundahl et al. 2006).

Given the status of these earlier studies, the aim of the current review was to conduct an updated investigation into

parental and familial factors as possible predictors or moderators of treatment outcome in youth with CPs. The outcome measures examined were changes in conduct problems in children and adolescents following PMT interventions. The earlier reviews by Lundahl et al. (2006) and Reyno and McGrath (2006) examined studies through 2003 to mid-2004, respectively, and were limited in their examination of moderators of treatment outcome (Lundahl et al. 2006). A more recent review examined a range of moderators through 2013, but was limited to young children between 1 and 10 years of age (Shelleby and Shaw 2014). We set out to identify and systematically review the literature from the past 15 years (from mid-2004 to mid-2019). The current review examines all familial and parental predictors and moderators in treatments identified as PMT programs for youth between 3 and 16 years of age.

Methods

This review was conducted in accordance with the PRISMA guidelines (Moher et al. 2009, 2015), and the review protocol was registered with PROSPERO [CRD42017058996].

Inclusion and Exclusion Criteria

The review included studies that reported treatment outcomes in parent management training for children and adolescents (3–16 years) with disruptive behavior problems (ODD, CD, and oppositional behaviors), and reported whether parental and familial characteristics were associated with (moderated or predicted) treatment outcomes. Children and adolescents with comorbid Attention Deficit-Hyperactivity Disorder (ADHD) or with other comorbid concerns, such as internalizing disorders, were included in the review provided the primary target for the intervention was externalizing conduct behavior problems. Intermittent Explosive Disorder was not included due to its more recent recognition as a disruptive behavior disorder in the Diagnostic Statistical Manual (DSM-5; American Psychiatric Association 2013). In addition, the following specific inclusion criteria were employed: 1. Sample drawn from a randomized clinical trial (RCT); 2. Studies with a primary outcome measure of conduct behavior problems; 3. Studies reported a quantifiable measure of the association between predictor and/or moderator variables and treatment outcome measures; 4. The parent management training program was an identifiable program with the core components of parent management training being enlisted (e.g., praise, special time and cost contingency) to parents; 5. The sample contained at least 5 participants. Studies were excluded if the intervention was limited to teachers in school settings or for children with autism spectrum disorder or other developmental disabilities.

Search Strategy

The primary search strategy involved searching four databases: PsychINFO, MEDLINE, SCOPUS and Cochrane Central Register of Controlled Trials (CENTRAL). The search terms were as follows: externali*ing OR conduct OR behavio*r problems OR Oppositional OR antisocial OR disruptive OR non-compliance AND parent training OR parent* intervention OR parent management training OR treatment intervention AND predict* OR factors OR response OR outcome OR treatment outcome. Only peer-reviewed studies published between October 2004 and July 2019 were included. Retrieved studies were then filtered for age groups (only children and adolescents between 3 and 16 were included) and English language, followed by additional exclusion criteria (listed below). Our secondary search strategy included article search on Google Scholar as well as searching through the main online PMT libraries (Triple P, Incredible Years, PMTO and PCIT). Finally, reference lists from included studies and previous literature reviews in the field were hand searched. Figure 1 represents a PRISMA flow diagram illustrating the selection process that followed.

Study Selection

Following the initial search, abstracts and titles were screened to determine their relevance to this review. Studies that could be immediately excluded on the basis of title were discarded. For the remaining references, the first author (ADW) reviewed abstracts to assess compliance of studies with eligibility criteria. Full text manuscripts were then retrieved and evaluated against the inclusion criteria. The second author (SAD) reviewed a random subset of the full text manuscripts (20%). There was 86% agreement between ADW and SAD; disagreements were discussed and resolved. Two studies required further discussion with the last author (THO) and were resolved. The first author (ADW) coded and extracted all the data. The second author (SAD) checked a subset to ensure that all the extracted data were recorded and reported accurately. Information extracted from each study included: authors, year of study, original study from which the sample was drawn, age, gender and ethnicity of participants, intervention used, format (group or individual), sample size, measures used, criteria required for inclusion, follow-up length, and risk of bias (shown in Tables 1, 3 and Fig. 2). The predictor/moderator variables examined and main findings were also extracted (shown in Table 2).

Risk of Bias in Individual Studies

Risk of bias for the included studies was assessed using the Revised 'Risk of Bias' tool (RoB 2.0) developed by the Cochrane Collaboration (Higgins et al. 2016). This tool

Table 1 Study characteristics

Study	Age, gender and ethnicity	Intervention, format and N	Measures	Criteria required for inclusion	Follow-up length
<i>Incredible Years (IY; Webster-Stratton, 1981; 1982a, b; 2008)</i>					
Scott (2005) Sample from Scott et al. (2001) (UK)	Age 3–8 years, ($M=7$, $SD=1.66$) 71% male Ethnicity: 10% ethnic minority, specific not reported	Group $N=59$	Demographic information; PACS; SDQ; PDPQ; BDI	Referred for antisocial behavior	1 yr
Beauchaine et al. (2005) Combined sample from 6 RCTs by Webster-Stratton (1982a, b, 1984, 1994), Webster- Stratton and Hammond (1997), Webster- Stratton et al. (1989) and Webster-Stratton et al. (1999) (USA)	Age 3–8.5 years. ($M=5.4$, $SD=1.3$) 78% male Ethnicity: 4.8% African American, 88.5% Caucasian, 3.9% Latino, 2.8% other	Group $N=514$ $PT=317$ $CT=60$ $PT+CT=38$ $PT+TT=24$ $CT+TT=23$ $PT+CT+TT=25$ $WLC=27$	CBCL; DDI; PSI; ECBI; DPICS-R; DAS; BDI; PSAAQ; Hollingshead two factor index	Diagnosis of ODD and/or CD according to DSM-III-R or DSM-IV. Clinically significant levels on the ECBI	1 yr
Fossum et al. (2008) Sample from Larsson et al. (2009) (Norway)	Age 4–8 years. ($M=6.6$, $SD=1.3$). Boys: $PT=80.9\%$, $PT+CT=78.8\%$, $WLC=78.6\%$ Ethnicity: 98% native-speaking Norwe- gians, other 2% ethnicity not reported	Group $N=127$ $PT=47$ $PT+C=52$ $WLC=28$	ECBI; DPICS-R; PBQ-TRF; KSADS; PSI; BDI	Diagnosis of ODD and/or CD according to DSM-IV. Clini- cally significant levels on the ECBI	None
Lavigne et al. (2008) Sample from Lavigne et al. (2007) (USA)	Age 3–6 years. ($M=4.6$, $SD=1.0$) 53% male Ethnicity: 75% White, 25% not white	Group $N=117$ Nurse-led=49, Psychologist- led=37, Minimal Intervention=31	Family Background Question- naire; BDI; RABI; ECBI; CBCL; Videotaped Par- ent-child Interaction; PSI-SF; C-GAS	Met diagnostic criteria DSM-IV for ODD based on clinical consensus diagnoses	12 months
Gardner et al. (2010) (UK)	Age 36–59 months. IY: ($M=46.4$, $SD=6.6$); WLC: ($M=46.2$, $SD=4.2$) Gender: IY: 57% male; WLC: 66% male Ethnicity: Not specified	Group Total $N=133$ IY=86 WLC=47	PDHQ; ECBI Problem Scale score; BDI	At risk of developing CD-scored above clinical cut-off on the ECBI problem or intensity scale	6 months

Table 1 (continued)

Study	Age, gender and ethnicity	Intervention, format and N	Measures	Criteria required for inclusion	Follow-up length
Drugli et al. (2010a) Sample from Larsson et al. (2009) (Norway)	Age 4–8 years. ($M=6.6$, $SD=1.3$) 80% male Ethnicity: Not specified	Group Total $N=99$ PT = 47 CT + PT = 52	Parent interview; Demographics; ECBI; CBCL; Kiddie-SADS; PPI; PBI-TRF; PSI	Sub-threshold or diagnosis of ODD and/or CD determined by Kiddie-SADS	1 year
Drugli et al. (2010b) Sample from Larsson et al. (2009) (Norway)	Age 4–8 years ($M=12.1$, $SD=1.3$) 83% male Ethnicity: Not specified	Group Total $N=54$ PT = 20 PT + CT = 34	Demographics; Kiddie-SADS, ECBI, CBCL; PPI, BDI, PSI	Sub-threshold or diagnosis of ODD and/or CD determined by Kiddie-SADS	5–6 years
Seabra-Santos et al. (2016) (Portugal)	Age 3–6 years. ($M=55.86$ months, $SD=11.20$) 73% male Ethnicity: Portuguese	Group Total $N=124$ IY = 68 WLC = 56	Demographics; SDQ; PKBS-2; BDI	A score above 80th percentile on the SDQ to determine if at risk for disruptive behaviors	12 and 18 months
Weeland et al. (2017) (Netherlands)	Age 4–8 years ($M=6.21$, $SD=1.33$) 30% male Ethnicity: 97.4% born in The Netherlands, other 2.6% specifics not reported	Group Total $N=387$ IY = 197 Control = 190	Demographics; PPI; ECBI; DPICS	A score at or above the 75th percentile on ECBI	4 months
Leijten et al. (2017) (Netherlands)	Age 3–8 years. ($M=5.6$, $SD=1.35$) 62% male Ethnicity: Recruited ($N=110$) 26% Caucasian, 39% Moroccan, 18% Turkish, 17% other Referred ($N=46$) 84% Cauca- sian, 11% Moroccan, 5% other	Group $N=154$ IY = 107 WLC = 47	ECBI; PPI; PSI-SF; SDQ; K-DBDS; DISC-IV; Parent Rating of Aggression instru- ment	Recruited: Identified parenting difficulties due to disruptive child behavior Referred: Diagnosis of ODD, CD, ADHD or parent-child relational problems	3 months

Table 1 (continued)

Study	Age, gender and ethnicity	Intervention, format and N	Measures	Criteria required for inclusion	Follow-up length
<i>Defiant Child (DC: Barkley, 2013)</i>					
Ollendick et al. (2016) (USA)	Age 7–14 years. ($M=9.52$, $SD=1.80$) Gender: CPS 67% male, DC 57% male, WLC 64% male Ethnicity: 84% Caucasian, 16% non- Caucasian	Individual Total $N=134$ CPS=60 DC=63 WLC=11	Demographic form; ADIS- C/P; CGI-S; CGI-I; DBDRS; BASC-2	Diagnosis of ODD based on the ADIS-C/P	6 months
Miller-Slough et al. (2016) Sample from Ollendick et al. (2016) (USA)	Age 7–12 years. ($M=9.66$, $SD=1.75$) 61% male Ethnicity: 88.45% Caucasian, 4.75% African American, 4.3% Asian American, 2.65% Hispanic/ Latino, 0.25% Native American, 1.8% Biracial	Individual. Total $N=75$ (ie DC+CPS) – specific group n's not specified	ADIS-C/P; Emotion Talk Task; BASC-2	Diagnosis of ODD according to diagnostic criteria	None
Eckshain et al. (2019) Sample from Weisz et al. (2012) (USA)	* Age 7–13 years ($M=10.11$, $SD=1.69$) Gender: 67.6% male Ethnicity: 46.5% White/Caucasian, 9.9% African, American/Black, 5.6% Hispanic/Latino, 1.4% Asian, 32.4% multi-racial, 4.2% other	Individual DC=63	CBCL; YSR; BPC; BSI	DSM–IV diagnosis or clinically elevated problem levels in the areas of anxiety, depression, and/or disruptive conduct	None
<i>Communication Method (COMET: Kling et al. 2010)</i>					
Kling et al. (2010) (Sweden)	Age 3–10 years ($M=6$, $SD=2.3$) 60% male Ethnicity: 78% born in Sweden, 22% immigrants	Group Total $N=148$ PMT-nurse group = 56 PMT-self-led = 52 WLC = 40	Demographic questionnaire and composite score of: PDR, ECBI-IS, ECBI-PS; PPI	A score above the 90th per- centile on the impact and burden scale from SDQ	6 months

Table 1 (continued)

Study	Age, gender and ethnicity	Intervention, format and N	Measures	Criteria required for inclusion	Follow-up length
Högström et al. (2014) Sample from Enebrink et al. (2012) (Sweden)	Age 3–11 years (<i>M</i> = 6.71, <i>SD</i> = 2.31) 53.4% male Ethnicity: 98.3% born in Sweden, remaining % NR	Group Total <i>N</i> = 104 iCOMET = 58 WLC = 46	ECBI; PPI; SDQ; Homework Assignments: Total number of homework tasks completed; Prompting positive behavior; Responsive playtime; prepare and prompt; tasks and rewards Homework intended to reduce negative behaviors; Ignoring misbehavior; time-out	One SD above the mean on the ECBI in relation to the age of the child	18 months
Stattin et al. (2015) (Sweden)	Age 3–12 years Mean (<i>SD</i>): Connect 7.32 (2.41), Cope 7.07 (2.54), IYP 6.93 (2.15), Connect 9.8 (1.35), WLC 6.71 (2.35) Male: Comet 64.90% Cope 61.10% IYP 67.10% Connect 60.40% WLC 60.40% Ethnicity: 89% born in Scandinavian countries	Group Total <i>N</i> = 908 IYP = 122 Cope = 202 Connect = 218 WLC = 159	Demographics questionnaire; ECBI; SNAP-IV (ODD subscale)	All children seeking usual ser- vices, without an autism spectrum disorder diagnosis	None
<i>Parent Child Interaction Therapy (PCIT)</i> ; Eyberg et al. (1982)					
Werba et al. (2006) (USA)	Age 3–6 years (<i>M</i> = 58.1 mth, <i>SD</i> = 13) 80% male Ethnicity: 78% White, 14% Black, 8% Hispanic/Asian/biracial	Individual Total <i>N</i> = 99 WLC = 47 PCIT = 52	Treatment success was defined as meeting highly specific treatment completion criteria for PCIT. ECBI; PSI; BDI, PPVT-R, WPT, DAS, PLOC, DPICS-II and demographic information, Hollingshead's four-factor index, Maternal distress = composite of BDI and PSI	ODD diagnosis determined by DSM-III-R Structured Interview	None
<i>Helping the Non-compliant Child (HNC)</i> ; Forehand and McMahon 1981; McMahon and Forehand 2003)					
Parent et al. (2011) (USA)	Age 3–6 years (<i>M</i> = 4.50, <i>SD</i> = NR) 51% Male Ethnicity: 92.3% European American, 7.7% other	Group <i>N</i> = 39 GC = NR WLC = NR	ECBI; BSI; PCS (conflict sub- scale); demographics	Parents expressed an interest in improving their child's behavior	2 months

Table 1 (continued)

Study	Age, gender and ethnicity	Intervention, format and N	Measures	Criteria required for inclusion	Follow-up length
Zachary et al. (2017) Secondary analysis of data from Jones et al. (2014) (USA)	Age 3–8 years. ($M = 5.69$, $SD = 1.58$) 47% male Ethnicity: 16% Hispanic/Latino, 31% African American, 47% Caucasian, 6% other	Individual $N = 22$ HNC = 11 TE-HNC = 11	ECBI; CCNES; DERS; Efficiency of services	Clinical range of disruptive behaviors on the ECBI	None
<i>Brief Parent Training (BPT):</i> Askeland et al. (2006)					
Kjøbli et al. (2014) (Norway)	Age 3–12 years. ($M = 7.28$, $SD = 2.61$) 68.1% male Ethnicity: 93.5% Norwegian background, 1.9% other Western European Countries, 4.6% other	Individual $N = 187$ BPT = 95 TAU = 92	Parent: ECBI; CBCL; HCSBS. Teacher: SSBS; Maternal mental distress: SCL-5	Exhibit problem behavior, based on clinical judgements at first contact	None

Table 1 (continued)

Study	Age, gender and ethnicity	Intervention, format and N	Measures	Criteria required for inclusion	Follow-up length
<i>Triple P</i> (Sanders 1999)					
Dittman et al. (2014)	Age 3–8 years. ($M = 5.63$, $SD = 1.65$) 71% male	Individual Total $N = 89$ TPOI = 89	Demographics; ECBI; PS; PTC; Brief-CAP; DASS; PAI; PPC; Parent child relationship quality; Parental attributions regarding child misbehavior	Elevated levels of disruptive behavior problems	None
Sample from Sanders et al. (2014) (New Zealand)	Ethnicity: 92% New Zealand European background, 4% Maori, 4% Pacific Islanders				

ADHD Attention Deficit Hyperactivity Disorder; *ADIS-C/P* Anxiety Disorders Interview Schedule for DSM-IV, Child and Parent Versions; *BASC-2* Behaviour Assessment System for Children, Second Edition; *BDI* Beck Depression Inventory; *BPC* The Brief Problem Checklist; *Brief-CAP* Brief version of Child Maltreatment Risk; *BSI* Brief Symptom Inventory; *CBCL* Child Behaviour Check List; *CCNES* Coping With Children's Negative Emotions Scale; *CD* Conduct Disorder; *C-GAS* Children's Global Adjustment Scale; *CGI* Clinical Global Impression-Improvement; *CGI-S* Clinical Global Impression-Severity; *CPS* Collaborative & Proactive Solutions; *CT* Child Training; *DAS* Dyadic Adjustment Scale; *DASS* Depression Anxiety Stress Scales; *DBDRS* Disruptive Behaviour Disorders Rating Scale; *DDI* Daily Discipline Inventory; *DERS* Difficulties in Emotion Regulation Scale; *DISC-IV* Diagnostic Interview Schedule for Children Version IV; *DPICS* Dyadic Parent-Child Interaction Coding System; *DPICS-II* Dyadic Parent-Child Interaction Coding System II; *DPICS-R* Dyadic Parent-Child Interaction Coding System-Revised; *DSMIII-R* Diagnostic and Statistical Manual of Mental Disorders Third Edition-Revised; *DSM-IV* Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition; *ECBI* Eyberg Child Behaviour Inventory; *ECBI-IS* Eyberg Child Behaviour Inventory-Intensity Scale; *ECBI-PS* Eyberg Child Behaviour Inventory-Problem Scale; *GC* Group Curriculum; *HCSBS* Home and Community Social Behaviour Scales; *IQ* Intelligence Quotient; *K-DBDS* Kiddie-Disruptive Behaviour Disorder Schedule; *KSADS* Kiddie Schedule for Affective Disorders and Schizophrenia; *NR* Not Reported; *NS* Not Significant; *ODD* Oppositional Defiant Disorder; *PACS* Parent Account of Child Symptoms; *PAI* Parental Anger Inventory; *PBQ-TRF* Preschool Behaviour Questionnaire-Teacher Report Form; *PCS* Parenting Convergence Scale; *PDHQ* Personal Data and Health Questionnaire; *PDPQ* Parent Defined Problems Questionnaire; *PDR* Parent Daily Report; *PKBS-2* Preschool and Kindergarten Behaviour Scales-Second Edition; *PLOC* Parental Locus of Control Scale; *PPC* Parent Problem Checklist; *PPV* Parent Practices Interview; *PPVT-R* Peabody Picture Vocabulary Test-Revised; *PS* Parenting Scale; *PSAAQ* Parental Substance and Alcohol Abuse Questionnaire; *PSI* Parenting Stress Index; *PSI-SF* Parenting Stress Index-Short Form; *PT* Parent Training; *PTC* Parenting Task Index; *RABI* Rochester Adaptive Behaviour Inventory; *RCTs* Random-Controlled Trials; *SCL-5* Symptom Check List-5; *SDQ* Strengths and Difficulties Questionnaire; *SES* Socio-economic Status; *SNAP-IV* Swanson, Nolan, and Pelham Rating Scale; *SSBS* School Social Behaviour Scales; *TAU* Treatment as usual; *TE-HNC* Technology-Enhanced Helping the Noncompliant Child; *TRF* Teacher Report Form; *TT* Teacher Training; *VPCI* Videotaped Parent-Child Interaction; *WLC* Wait list control; *WPT* Wonderlic Personnel Test; *YSR* The Youth Self-Report.

*Demographics are based on a combined sample of internalizing ($n = 79$) and externalizing disorders ($n = 63$). Results for the externalizing disorders are presented
 – indicates not applicable

Table 2 Main findings

Study	Main findings	
	Predictors	Moderators
<p><i>Incredible Years (IY; Webster-Stratton, 1981; 1982a, b; 2008)</i> Scott (2005)</p> <p>Beauchaine et al. (2005)</p>	<p>Mother in ethnic minority; SES; single parent; maternal depression, maternal education level, shorter pregnancy</p> <p><i>All variables tested as moderators and predictors</i></p> <p>Life stress, marital adjustment and satisfaction, maternal depression, parental substance and alcohol abuse, maternal education, maternal age, maternal relationship status, social class</p>	<p>None</p> <p>See previous column</p>
Fossum et al. (2008)	Maternal factors: age, marital status, education, stress and depression	None
Lavigne et al. (2008)	<p><i>All variables tested as moderators and predictors</i></p> <p>Demographic characteristics: parental education, minority status, marital status, SES</p> <p>Parent characteristics: maternal life stress, maternal depression, distress</p> <p>Parent–child interactions: initial levels of maternal warmth, respect for autonomy, maternal structure, assistance</p> <p>synchrony/quality, or overall competence; parent–child dysfunction interaction; specific interaction variable including: use of a-commands (specifically stated maternal commands), questions, rewards, attends</p>	<p>See previous column</p>
Gardner et al. (2010)	Single or teen parenthood, very low income, maternal depression*	None

Main findings

Predictors

Moderators

All NS

More positive treatment responses were observed at 1 year in children of (a) younger mothers and (b) parents with substance abuse histories

Children of mothers reporting low marital adjustment had better 1 yr outcomes when the interventions included PT. *In mother-reported and behavior observation models:* Children who (a) were below the sample median on social class, (b) had fathers with a history of substance abuse, (c) were parented by single mothers, or (d) had mothers with higher symptoms of depression, each fared best at 1 year outcome when PT or CT was included in their treatment

High levels of maternal stress predicted a worse treatment outcome in maternal reports on the ECBI for both treatment groups at post-therapy

Higher levels of initial life stress, parenting distress and parent–child dysfunction, predicted greater gains following treatment at follow-up

Lower initial levels of parenting distress, life stress and parent–child dysfunction, predicted less behavior problems following treatment at post and follow-up

All NS (Statistically significant interaction for maternal education but cells too small so results not interpreted)

Children of more depressed mothers had better outcomes following intervention, relative to children in the control group who experienced poorer outcomes

Table 2 (continued)

Study	Predictors	Moderators	Main findings	
			Predictors	Moderators
Drugli et al. (2010a)	Family processes: lone parenthood, contact with child protection service. Maternal factors: educational level, psychiatric treatment, parenting style (positive and harsh parenting), parenting stress	None	Having contact with child protection services (vs. no contact) was found to predict treatment nonresponse at the 1-year follow-up	-
Drugli et al. (2010b)	Living with mother only, maternal depressive symptoms and maternal parenting stress	None	At pre-treatment, living with mother only predicted ODD/CD diagnosis at 5–6 years follow-up High levels of maternal depressive symptoms and stress at post-treatment predicted a diagnosis of ODD/CD at 5–6 years follow-up. No longer significant when controlling for other variables	-
Seabra-Santos et al. (2016)	Maternal depressive symptoms, SES*	None	All NS	-
Weeland et al. (2017)	SES, family composition*	None	All NS	-
Leijten et al. (2017)	Education level, ethnic background*	None	All NS	-
<i>Defiant Child (DC; Barkley, 2013)</i>				
Ollendick et al. (2016)	Socioeconomic status and race/ethnicity	None	All NS	-
Miller-Slough et al. (2016)	Parent child synchrony	None	Parent child synchrony at pre-treatment was associated with lower emotional lability and less aggression at the end of treatment	-
Eckstain et al. (2019)	Parental depressive symptoms	None	NS for post-treatment outcome. However, children of parents with elevated levels of depressive symptoms showed significantly faster levels of improvement during treatment	-
<i>Communication Method (COMET; Kling et al. 2010)</i>				
Kling et al. (2010)	None	Single-parent homes, mother's age, father's age, immigrant parents, mothers with higher education, fathers with higher education	-	All NS
Högström et al. (2014)	Homework promoting positive behaviors; homework intended to reduce negative behaviors	None	Pre- to post-improvement was predicted by parents' implementation of Homework assignments intended to reduce negative behavior	-

Table 2 (continued)

Study	Predictors	Moderators	Main findings	
			Predictors	Moderators
Stattin et al. (2015)	None (personal financial) strain, marital status, immigrant origin and parents' receipt of therapeutic services	Parent age, family income, economic		All NS
<i>Parent Child Interaction Therapy (PCIT; Eyberg and Robinson 1982)</i>				
Werba et al. (2006)	Demographic characteristics: SES, maternal age, single-parent status, number of children in family. Maternal characteristics: IQ, depressive symptoms, marital adjustment, parenting stress related to parent characteristics, maternal parenting stress related to child characteristics, total maternal parenting stress, parenting locus of control, tolerance for child misbehavior Maternal behavior management skills: total commands, inappropriate behavior, prosocial behavior, direct command ratio	None	For mothers: high stress and inappropriate behavior (criticism and sarcasm observed during parent-child interactions) predicted treatment drop out and poorer treatment outcome. Younger mothers were significantly more likely to drop out of WLC and PCIT groups	-
<i>Helping the Non-compliant Child (HNC; Forehand and McMahon 1981; McMahon and Forehand 2003)</i>				
Parent et al. (2011)	Parental depression, marital status; co-parent conflict	None	Higher levels of parent depressive symptoms predicted lower levels of child disruptive behavior at 2-month follow-up	-
Zachary et al. (2017)	Caregiver emotion dysregulation and socialization practices	None For emotion socialization, higher, rather than lower, coaching of children's emotions was moderately associated with higher (rather than lower) caregiver ratings of child behavior as problematic at post-treatment	Baseline caregiver emotion regulation predicted treatment duration and outcomes (more dysregulation was associated with poorer outcomes and longer treatment duration)	-
<i>Brief Parent Training (BPT; Askeland et al. 2006)</i>				
Kjøbli et al. (2014)	<i>Variable examined as moderator and predictor</i> maternal mental distress (anxiety and depression)	See previous column	High maternal distress predicted poor treatment outcome for parent and teacher reported conduct problems. For the BPT group, low maternal distress predicted positive (teacher reported) outcomes and high maternal distress reported poorer (teacher reported) outcomes	Low levels of maternal distress and high levels of parent reported conduct problems predicted better treatment outcomes for the BPT versus comparison group

Table 2 (continued)

Study	Main findings	
	Predictors	Moderators
Triple P (Sanders 1999) Dittman et al. (2014)	<p>Family processes: parental education and low SES</p> <p>Parent variables: depression, ineffective discipline, parenting confidence, parent–child relationship quality, child maltreatment risk, and parental attributions regarding child misbehavior</p> <p>Father participation in the intervention*</p>	<p>None</p>

CD Conduct Disorder, CT Child Training, ECBI Eyberg Child Behavior Inventory, IQ Intelligence Quotient, NS Not Significant, ODD Oppositional Defiant Disorder, PT Parent Training, SES Socioeconomic Status, WLC Wait list control, — indicates not applicable

*Studies indicated moderation but are prediction analyses (Kraemer et al. 2002)

allowed assessment of potential sources of bias in each study, including (1) randomization process; (2) deviations from intended interventions; (3) missing outcome data (4) measurement of outcome; (5) selection of reported results and (6) reporting bias. Each category was coded as low, high or possessing some concerns as suggested by Higgins et al. (2016). The assessment of study quality was undertaken independently by ADW, with 20% of the analyses checked by SAD. Inter-rater reliability was estimated with Cronbach’s alpha, with an overall bias level agreement of 1 and a Cronbach’s alpha of 0.904 for agreement across the different types of biases. Disagreements were resolved through discussion.

Data Extraction

Data extracted from included studies were recorded using a data extraction form designed for this review. Data included study details, study setting, sample characteristics, measures used, intervention format, inclusion criteria, follow-up length, risk of bias and predictors, and moderators examined (see Tables 1, 2 and 3).

Data Synthesis

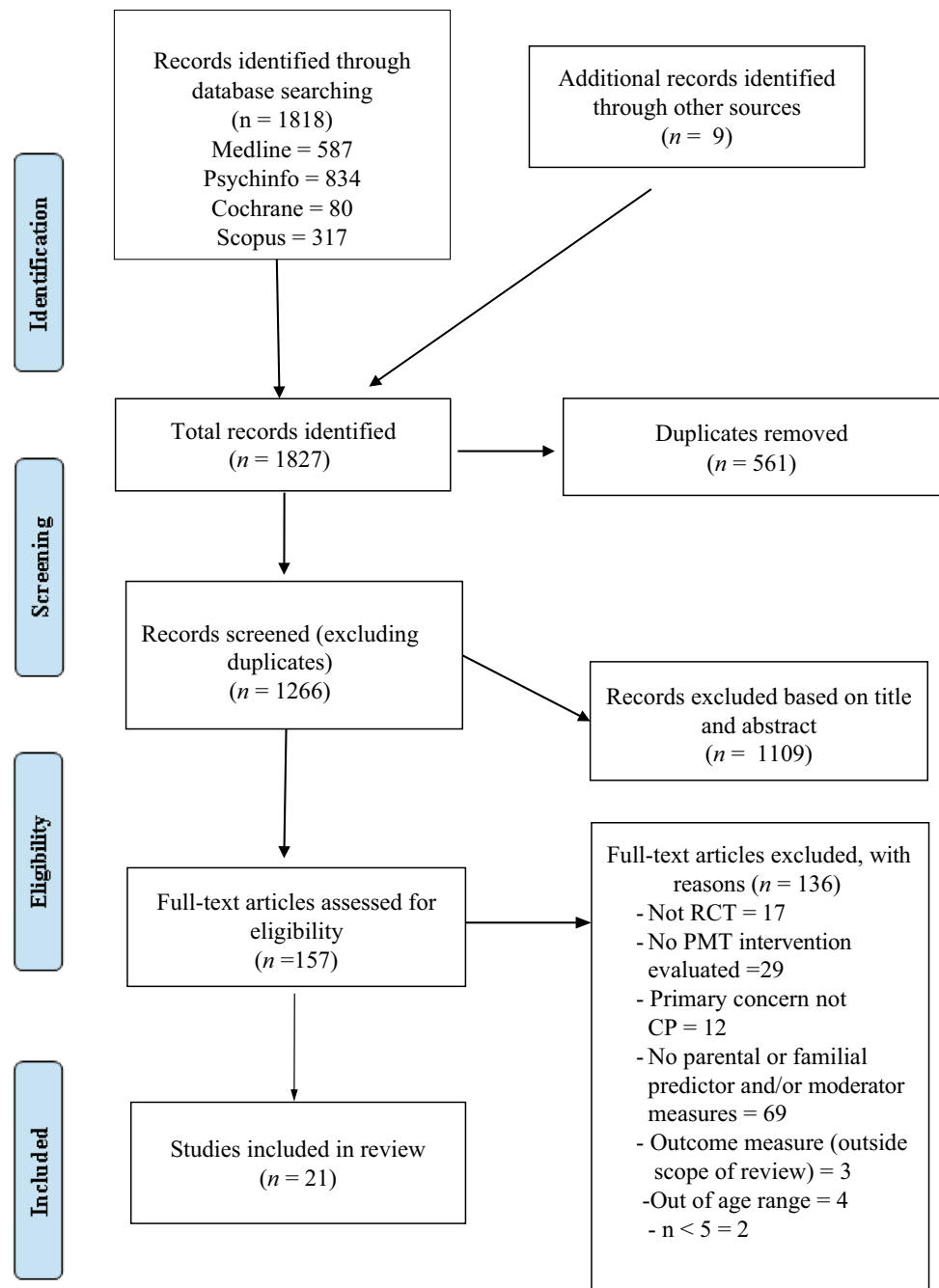
A narrative synthesis of the results was undertaken. Unfortunately, a meta-analysis was not feasible for this review due to the limited number of studies (n = 21) and the considerable heterogeneity of methods evident across studies. For example, there was great variability in the outcome variables used and statistical analyses employed, with some studies examining categorical end diagnostic state and others analyzing dimensional levels of symptomatology. Further, considerable variability was evident in the type of PMT program implemented and whether it was delivered in group or individual format.

Results

Study Selection

A total of 1827 records were examined. Five hundred and sixty-one records were removed as duplicates and further 1109 were removed at title and abstract screening stage. This left 157 records that were examined as full text records, 136 of which were excluded leaving 21 studies for inclusion in the review. Figure 1 provides an account of the study selection process.

Fig. 1 Overall flow chart of articles screened.



Study Characteristics

Characteristics of the included studies, grouped by type of PMT intervention, are presented in Table 1. Of the 21 studies examining predictors and moderators of change, 10 reported on the Incredible Years intervention (Webster-Stratton and Reid 2003). The remaining 11 interventions included other variations of parent management training including: Helping the Non-Compliant Child (McMahon and Forehand, 2003, $n = 2$), Communication Method (Kling et al. 2010, $n = 3$), Brief Parent Training (Askeland et al. 2006, $n = 1$), Defiant

Child (Barkley, 2013, $n = 3$), Triple P (Sanders 1999, $n = 1$), and Parent Child Interaction Therapy (Brinkmeyer and Eyberg 2003, $n = 1$). Of the 21 studies included, 14 interventions were delivered in a group format and 7 were delivered individually. The majority of the studies were conducted in the United States ($n = 8$), followed by Norway ($n = 4$), Sweden ($n = 3$), The Netherlands ($n = 2$), UK ($n = 2$), Portugal ($n = 1$), and New Zealand ($n = 1$).

Fig. 2 Risk of bias graph, summarizing authors' ratings of included studies on risk of bias dimensions, presented as percentages across all included studies

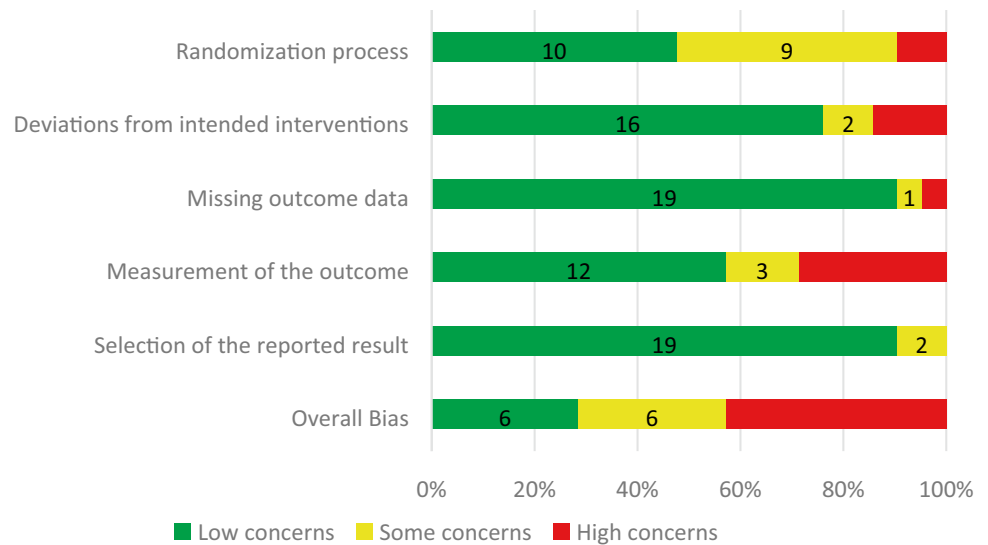


Table 3 Risk of bias summary for included studies

Authors	Randomization process	Deviations from intended interventions	Missing outcome data	Measurement of outcome	Selection of reported results	Overall bias
Scott (2005)	?	+	?	+	+	–
Beauchaine et al. (2005)	+	–	+	?	+	?
Fossum et al. (2008)	–	+	+	+	+	–
Lavigne et al. (2008)	?	?	+	+	+	?
Gardner et al. (2010)	+	+	+	+	+	+
Drugli et al. (2010a)	?	+	+	–	+	–
Drugli et al. (2010b)	–	+	–	+	+	–
Seabra-Santos et al. (2016)	+	+	+	+	+	+
Weeland et al. (2017)	+	+	+	+	+	+
Leijten et al. (2017)	+	–	+	–	+	–
Ollendick et al. (2016)	+	+	+	+	+	+
Miller-Slough et al. (2016)	+	+	+	+	+	+
Eckshtain et al. (2019)	+	+	+	+	+	+
Kling et al. (2010)	?	+	+	+	+	?
Högström et al. (2014)	+	+	+	–	+	–
Stattin et al. (2015)	?	+	+	+	+	?
Werba et al. (2006)	?	+	+	–	?	–
Parent et al. (2011)	?	+	+	–	+	–
Zachary et al. (2017)	?	?	+	?	+	?
Kjøbli et al. (2014)	+	+	+	?	?	?
Dittman et al. (2014)	?	–	+	–	+	–

+ : low concern; –: high concern; ?: some concern

Research Design

All 21 studies were RCTs, with 14 of the 21 studies comparing an intervention to an active control and the remaining seven to a waitlist control. Predictors were examined in 19 of the 21 studies, while moderators were examined in only 5 studies (with three of these studies examining the variables

as both predictors and moderators). Within the 19 studies investigating predictors, an additional four studies indicated they had undertaken moderation analyses but in line with Kraemer et al.’s (2002) definition, they were more accurately predictor analyses and were subsequently analyzed as predictors only (Gardner et al. 2010; Leijten et al. 2017; Seabra-Santos et al. 2016; Weeland et al. 2017).

Risk of Bias Within Studies

Risk of bias ratings is shown in Table 3 and Fig. 2. The methodological quality of the studies varied greatly, with the majority of studies yielding acceptable levels of risk within the six bias indices. Ten studies (47%) reported adequate randomization methods with nine studies (43%) presenting some limitations, mostly due to inadequate reporting of the specific randomization method employed. The remaining two (10%) studies presented high levels of concern. The majority of the studies were classified as low risk of bias for deviations from intended interventions (76%), missing outcome data (90%), measurement of outcome (57%), and selection of reported results (90%). Overall, six studies were classified by reviewers as low risk on all six indices, four as low risk on four indices, seven studies as low risk on three measures and the remaining four studies as low risk on two bias measures. The overall risk of bias rating was categorized as low for six studies, some concerns for six studies and high potential risk of bias for nine of the 21 studies.

Sample Characteristics

Sample sizes per study ranged from 22 to 908. Children included in the studies ranged in age from 3 to 14 years—none of the studies investigated children from 14 to 16 years. The majority of interventions were delivered to children whose average ages were between 3 and 8 years, with only six of the 21 studies including children above the age of 10 years. In 19 studies, the majority of the children were male. In terms of presentation criteria, a diagnosis of ODD was required for inclusion in six of the studies, four studies required children to display elevated levels of disruptive behaviors, and six required the child to reach a clinical cut-off for disruptive behaviors on a parent-report measure such as the Eyberg Child Behavior Inventory (ECBI; Robinson et al. 1980) or the Strengths and Difficulties Questionnaire (SDQ; Goodman 1997). A further two required both an ODD or CD diagnosis, as well as clinically significant levels on the ECBI. Finally, two studies required an ODD diagnosis or for the younger children to display elevated levels of disruptive behaviors, while for the remaining study children received treatment as part of usual services provided and did not require a listed diagnosis.

Child behavior outcome measures varied across studies. The majority of studies (16) used parent-report measures, most commonly the ECBI or the Child Behavior Checklist (CBCL; Achenbach 1991a, 1991b). Thirteen of these studies relied solely on parent-report measures for measuring treatment outcome. The presence of diagnosis was the primary outcome in five studies. Semi-structured interviews, such as the Anxiety Disorders Interview Schedule – child and parent version and (ADIS-C/P; Silverman and Albano

1996) and the Diagnostic Interview Schedule for Children (Kiddie-SADS; Shaffer et al. 2000), were used in seven studies; however, two of these studies used them to determine the inclusion of participants rather than as an outcome measure. Only three used observational methods. More than one criterion variable was used in 16 (76%) of the 21 studies.

Predictor and Moderator Main Findings

A synthesis of the moderator and predictor main findings is presented in Table 2.

Do Familial Characteristics Predict or Moderate Treatment Outcomes?

A variety of demographic and familial variables were examined as predictors of treatment outcome including SES, parental education, parental age, marital status and family composition. These results are reported in detail below.

Predictors

Demographics

Ten studies examined whether SES predicted treatment outcome. Nine of these studies found that SES did *not* significantly predict outcomes following PMT treatment (Beauchaine et al. 2005; Dittman et al. 2014; Gardner et al. 2010; Lavigne et al. 2008; Ollendick et al. 2016; Scott 2005; Seabra-Santos et al. 2016; Stattin et al. 2015; Werba et al. 2006). One study found that in the control condition, higher SES predicted lower levels of externalizing behavior over time; however, after controlling for multiple testing, SES did not significantly predict treatment outcome in that study (Weeland et al. 2017).

Parents' age was examined as a predictor in three studies with variable findings (Beauchaine et al. 2005; Fossum et al. 2008; Werba et al. 2006). Of these studies, one found poorer outcome for children of younger mothers at post-therapy (Werba et al. 2006), one found better outcomes for children of younger mothers at one-year follow-up (Beauchaine et al. 2005), while one did not report significant age-related differences (Fossum et al. 2008).

Parental education was not found to be a significant predictor of treatment outcome. Non-significant results were found in seven studies examining parent education (Beauchaine et al. 2005; Dittman et al. 2014; Drugli et al. 2010a; Fossum et al. 2008; Lavigne et al. 2008; Leijten et al. 2017; Scott 2005). An additional study looking at maternal IQ (Werba et al. 2006) also failed to show significant findings.

Marital status was assessed in eight studies (Beauchaine et al. 2005; Drugli et al. 2010a, b; Fossum et al. 2008; Gardner et al. 2010; Lavigne et al. 2008; Scott 2005; Werba et al.

2006). Only one of these studies found it to be a significant predictor—living with mother alone predicted ODD/CD diagnosis at 5–6-year follow-up only (Drugli et al. 2010b). Family composition, including the number of children in the family, was investigated in two studies. No significant results were found in either study (Weeland et al. 2017; Werba et al. 2006). Four studies examined race/ethnicity as a predictor of treatment outcome with no significant findings (Lavigne et al. 2008; Leijten et al. 2017; Ollendick et al. 2016; Scott 2005).

Other Family Characteristics

Shorter pregnancy and having contact (versus no contact) with child protection services were examined as predictors in one study each. While there were no significant findings for shorter pregnancy (Scott, 2005), having contact with child protection services was found to predict treatment nonresponse at 1-year follow-up in one study (Drugli et al. 2010a). Marital adjustment and satisfaction revealed no significant findings in the two studies in which they were examined (Beauchaine et al. 2005; Werba et al. 2006).

Moderators

Demographics

SES was investigated as moderator of treatment outcome in three studies (Beauchaine et al. 2005; Lavigne et al. 2008; Stattin et al. 2015). These studies included a waitlist control or minimal intervention bibliotherapy group and other active treatments. Lavigne et al. (2008) compared a minimal intervention bibliotherapy group to a nurse-led versus psychologist-led IY intervention, while others examined whether SES was differentially influenced by four active treatments (IY, Cope, COMET, Connect) and a wait list control (Stattin et al. 2015). Beauchaine et al. (2005) used a combined analysis of 6 RCTS with a wait list control group and a comparison of three different IY programs (parent training, child training, and teacher training). These programs were delivered as either separate interventions or were combined (e.g., child training and teacher training). In behavior observation models it was found that children who were below the sample median on social class, fared best at one-year follow-up when the parent training (PT) and child training (CT) component were both included in the IY intervention (Beauchaine et al. 2005). There were no significant moderation effects found in the other study (Stattin et al. 2015). Of the three studies examining parental age, no significant moderation effects were found (Beauchaine et al. 2005; Kling et al. 2010; Stattin et al. 2015). Parental education also yielded no significant results in the three studies in which it was examined (Beauchaine et al.

2005; Kling et al. 2010; Lavigne et al. 2008). However, one of these studies initially yielded a statistically significant interaction for maternal education, but the cell sizes were too small, and the results were not interpreted further (Lavigne et al. 2008). Three studies examined race/ethnicity as a moderator, with no significant findings (Kling et al. 2010; Lavigne et al. 2008; Stattin et al. 2015).

Overall, marital status was not a moderator of treatment outcome (Kling et al. 2010; Lavigne et al. 2008; Stattin et al. 2015). Of the four studies examining marital status, only one study found a significant result—children of unpartnered mothers showed better outcomes at one-year follow-up when the PT or CT components of the IY intervention were included in treatment than when they were not (Beauchaine et al. 2005). Marital adjustment was also examined in one study (Beauchaine et al. 2005). This study found that interventions including the parent training component of IY resulted in better one year outcomes than when parent training was not included for children of mothers reporting low marital adjustment (Beauchaine et al. 2005). In sum, there is currently little to no evidence to suggest that family demographics such as SES, parental education, parental age, race/ethnicity, marital status and marital satisfaction moderate treatment outcomes.

Do Parental Characteristics Predict or Moderate Treatment Outcomes?

Overall, the results on the association between parental characteristics and treatment outcome are similarly inconsistent and/or inconclusive. There were no significant findings for maternal locus of control, parenting confidence, parent attributions of child misbehavior, child maltreatment risk, tolerance for misbehavior, father participation, or mother receiving treatment for a psychiatric disorder. Some support was found for parenting behaviors, parental substance abuse, emotion dysregulation and socialization, with significant findings only present in single studies. Strong support was, however, found for a positive parent–child relationship and interactions, which predicted better treatment outcomes. Specifically, fewer behavioral problems, less aggression and emotional lability were reported following treatment (Dittman et al. 2014; Lavigne et al. 2008; Miller-Slough et al. 2016). There was also some evidence to support an association between treatment outcome and maternal stress and depression, however, these findings were inconsistent (Drugli et al. 2010b; Fossum et al. 2008; Gardner et al. 2010; Werba et al. 2006). Robust support was found for high maternal distress predicting poor treatment outcome. Finally, some support was also found for maternal stress moderating treatment outcome (Kjøbli et al. 2014). These findings are examined in more detail below.

Predictors

Maternal Stress

Six studies investigated whether maternal stress predicted treatment outcome. This included measures of life stress and parenting stress. Two studies found high levels of maternal stress to significantly predict worse treatment outcome at post-therapy (Fossum et al. 2008; Werba et al. 2006), as well as dropout rates (Werba et al. 2006). At 12 months of follow-up, one study found lower maternal stress to have better treatment outcomes (Lavigne et al. 2008), while high initial levels of stress predicted greater gains following treatment. (Lavigne et al. 2008). Specifically, mothers reporting higher levels of pre-treatment life stress had children who displayed more ODD-related symptoms at pre-treatment and at follow-up compared to mothers with lower levels of initial life stress. However, children of mothers with high levels of initial life stress made greater improvements on the ECBI following treatment. Another study examining outcomes 5–6 years after treatment found high levels of maternal stress at post-treatment to predict a worse outcome, although this did not remain significant after controlling for other baseline characteristics (Drugli et al. 2010b). Parental stress was subsequently identified as a risk factor, whereby parental stress may increase the risk for maintaining an ODD/CD diagnosis as opposed to significantly predicting a child maintaining a diagnosis of ODD/CD 5–6 years after treatment (Drugli et al. 2010b).

Maternal distress was found to significantly predict treatment outcome in each of the two studies in which it was examined (Kjøbli et al. 2014; Lavigne et al. 2008). High maternal distress significantly predicted poorer treatment outcomes from teacher (Kjøbli et al. 2014) and parent ratings (Kjøbli et al. 2014; Lavigne et al. 2008). These significant findings were reported at post-therapy (Kjøbli et al. 2014; Lavigne et al. 2008) and 12 months following treatment (Lavigne et al. 2008). In terms of treatment gain, Lavigne et al. (2008) found higher levels of parental distress predicted greater gains at 12 months of follow-up than parents reporting less parental distress. That is, children of parents experiencing lower levels of pre-treatment distress made less improvements, but they displayed fewer behavior problems at 12-month follow-up than children of parents who were more distressed.

Maternal Depression

Ten studies investigated maternal depression as a predictor of treatment outcome (Beauchain et al. 2005; Dittman et al. 2014; Drugli et al. 2010b; Fossum et al. 2008; Gardner et al. 2010; Lavigne et al. 2008; Parent et al. 2011; Scott, 2005; Seabra-Santos et al. 2016; Werba et al. 2006) and one study

examined both maternal and paternal depression (Eckshtain et al. 2019). In terms of maternal depression, three of these studies found maternal depression to be a significant predictor of treatment outcome. More specifically, two studies found that maternal depression predicted better outcomes following PMT intervention, relative to the control group who experienced poorer outcomes (Gardner et al. 2010) and at two-month follow-up (Parent et al. 2011). Interestingly, while Eckshtain et al. (2019) found no significant association between levels of initial parental depression and treatment outcome at post-therapy, children of parents with elevated levels of depression improved at a significantly faster rate than children of parents with lower initial levels of depression.

Other Parental Characteristics

A number of other parental predictors have been examined; however, these have been reported only in single studies and, overall, yielded no significant results. These non-significant parental predictors included: mother receiving treatment for a psychiatric disorder (Drugli et al. 2010a); maternal locus of control (Werba et al. 2006); parenting confidence (Dittman et al. 2014); parental attribution of child misbehavior (Dittman et al. 2014); child maltreatment risk and tolerance for child misbehavior (Dittman et al. 2014; Werba et al. 2006), and father participation (Dittman et al. 2014). The exceptions to this include parental substance abuse which was found to significantly predict more positive treatment responses (Beauchaine et al. 2005) and to caregiver emotion dysregulation and socialization practices; high levels of emotion dysregulation and socialization significantly predicted poorer outcomes and longer treatment duration (Zachary et al. 2017).

Parent–Child Interactions/Relationship

Parent–child interaction, including relationship quality, was investigated as a predictor in three studies, each yielding significant findings: A more positive parent–child relationship predicted less behavior problems at post-treatment (Dittman et al. 2014; Lavigne et al. 2008), as well as at 12-month follow-up (Lavigne et al. 2008). Parent–child interaction, in the form of “parent–child synchrony,” was examined by Miller-Slough et al. (2016). Parent–child synchrony, defined as the ability of a parent–child dyad to share meaning and perspective on events, is characterized by active engagement, shared understanding, and willingness to listen to each other (Laible and Song 2006). Parent–Child synchrony at pre-treatment was associated with lower emotional lability and less aggression at the end of treatment (Miller-Slough et al. 2016).

Parenting Behaviors

The association between parenting behaviors and treatment outcome also yielded few significant findings. Of the three studies investigating parenting style (Drugli et al. 2010a) and behaviors (Dittman et al. 2014; Werba et al. 2006), only one study found that parenting behavior, specifically, criticism and sarcasm observed during parent–child interactions, predicted treatment drop out and poorer treatment outcome (Werba et al. 2006). No other associations were reported. Related to parenting behavior, a parent’s willingness to complete homework tasks given during treatment was examined in a single study (Högström et al. 2014). More specifically, completion of homework promoting positive behaviors and homework intended to reduce negative behaviors was examined as a predictor of treatment success (Högström et al. 2014). Pre- to post-improvement was predicted by parents’ implementation of homework assignments intended to reduce negative behavior.

Moderators

Maternal Stress/Distress

Two studies investigated maternal stress as a moderator of treatment outcome with no significant findings reported (Beauchaine et al. 2005; Lavigne et al. 2008). In addition, mental distress was assessed in two studies (Kjøbli et al. 2014; Lavigne et al. 2008). One of these studies found a significant moderation—lower levels of maternal distress and high levels of CPs differentially predicted treatment outcomes for the intervention group versus the treatment as usual group, specifically lower levels of distress predicted better outcomes for the intervention group (Kjøbli et al. 2014).

Maternal Depression

Maternal depression was assessed in two studies, with one study finding it to significantly differentiate between two different interventions (Beauchaine et al. 2005; Lavigne et al. 2008). Children of mothers scoring above the sample median of 8 on the BDI fared better at one-year follow-up in conditions that included PT or CT, than in conditions that did not include PT or CT (Beauchaine et al. 2005).

Other Parental Characteristics

Parent–child interactions were examined in a single study, with no significant findings (Lavigne et al. 2008). Parental substance abuse was also examined in single study and was found to significantly moderate treatment outcome, whereby children who had fathers with a history of substance abuse

had better outcomes at one-year follow-up when PT or CT was included in their treatment than when it was not included.

Discussion

The aim of the current review was to update Lundahl et al. (2006) and Reyno and McGrath’s (2006) earlier reviews in this area of inquiry. These early reviews examined a range of parenting interventions that included various PMT interventions. In addition, the more recent review by Shelleby and Shaw (2014) examined parenting interventions in a restricted age range (e.g., 1–10 years). To address these shortcomings and to update the findings, studies from the past 15 years on parental and familial predictors, as well as moderators, of treatment outcome were examined in the current review.

Main Findings

Even though demographic characteristics were examined in 10 of the 21 studies, very few significant findings were reported. For example, SES was most commonly examined, however, none of the 10 studies in which it was included found it to significantly predict treatment outcome. Only one study examined SES as a moderator, whereby children of lower SES demonstrated greater treatment benefit at 1-year follow-up if they were given both the parent training and child training components of the IY intervention (Beauchaine et al. 2005). Overall, studies published in the last 15 years have not found financial disadvantage to be associated with treatment response as previously suggested (e.g., Gardner et al. 2010; Ollendick et al. 2016). These findings are in contrast to Lundahl et al. (2006) and Reyno and McGrath’s (2006) earlier conclusions which indicated parent training was less effective for economically disadvantaged families. Perhaps this difference in findings over time can be accounted for by the differing levels of problem severity examined across studies. However, in the current review, initial problem severity varied across studies as indicated by the different inclusion criteria used. For example, some required a diagnosis of ODD for study inclusion, while others required a demonstration of elevated levels of disruptive behavior, most commonly determined by a clinical cut-off score on a parent-report measure. Others were identified as “at risk” of developing conduct problems. Interestingly, recent studies have found that when controlling for initial problem severity, financial disadvantage does not influence treatment outcomes even when initial problem behaviors are severe. That is, disadvantaged SES and non-disadvantaged SES participants benefited equally from parent training. However, disadvantaged SES participants benefited less from parent training when the initial problem behaviors were

mild and less severe (Leijten et al. 2013; Shelleby and Shaw 2014). Although speculative, this finding may be explained by less motivation to change in these families with less room for improvement. It also suggests that initial problem severity may be especially meaningful to assess in disadvantaged families.

Similarly, while Reyno and McGrath (2006) found low education/occupation to predict treatment outcome, parental education yielded no significant results in the three studies in which it was examined for the current review. When maternal age was investigated, the findings showed greater variability. Paradoxically studies reported both poorer and better outcomes for children of younger mothers (Beauchaine et al. 2005; Werba et al. 2006), while others found maternal age not to impact treatment outcome (Fossum et al. 2008).

Results regarding parental psychopathology were also at odds with previous meta-analyses (Reyno and McGrath 2006). Examination of parental psychopathology varied across studies, with most only examining maternal (not paternal) psychopathology. Maternal stress, depression, and distress each differed in reported findings. There was some evidence to suggest that higher levels of maternal stress predicted poorer outcomes post-treatment and at 12 months of follow-up (Fossum et al. 2008; Werba et al. 2006). However, despite these findings, the number of studies examining maternal stress was small with most studies examining maternal stress finding that it did not predict treatment outcome (Beauchaine et al. 2005; Drugli et al. 2010b).

Overall, no association between maternal depression and treatment outcome was found, despite it being the most consistently examined variable within the reviewed studies (12 of 21 studies). Surprisingly, and again in contrast to the previous meta-analyses, more recent studies suggest that interventions are equally effective for parents reporting a high level of stress and symptoms of depression compared to those experiencing lower levels of stress and depression (e.g., Beauchaine et al. 2005; Dittman et al. 2014; Fossum et al. 2008; Drugli et al. 2010b; Lavigne et al. 2008; Scott 2005; Seabra-Santos et al. 2016; Werba et al. 2006). However, when high maternal stress and depression were examined in combination, some support was found for their ability to predict poor treatment outcome (Kjøbli et al. 2014; Lavigne et al. 2008). This may be explained within a cumulative risk model framework (e.g., Rutter 1979). For example, it may be that depression and stress have a cumulative effect on the parent's ability to cope with demands and, therefore, successfully engage and implement the parent training. That is, the combined effect of depression and stress may increase the likelihood of finding an effect when compared to assessing the effects of these risk factors (i.e., depression and anxiety) separately (Rutter 1979). While this is a potentially promising avenue in terms of further improving our understanding of treatment predictors, the studies are

limited and, in the absence of further research, conclusions are tentative rather than definitive.

Support for parent–child interactions are arguably the clearest finding in the current review. All three of the studies examining parent–child relationships and parent–child interactions found that better treatment outcomes were predicted by a positive parent–child relationship and parent–child interactions (Dittman et al. 2014; Lavigne et al. 2008; Miller-Slough et al. 2016). These findings support previous research that oppositional behavior may be viewed within a transactional or reciprocal model, whereby problematic behaviors occur when there is a mismatch, or incompatibility, between child characteristics and parental expectations of the child (Greene et al. 2003). Moreover, closing the gap between child characteristics and parental expectations has been found to lead to fewer problematic behaviors (Greene 1999; Greene and Winkler 2019). It follows that a more positive parent–child relationship, with fewer incompatibilities before commencing treatment, would lead to better outcomes. This was found in the studies examined in this review (Dittman et al. 2014; Lavigne et al. 2008; Miller-Slough et al. 2016), as well as being well documented in the wider literature (e.g., Booker et al. 2016). Despite this, further replication is needed before definitive conclusions can be reached.

In sum, only tentative conclusions can be drawn regarding specific parental and familial characteristics, as well as processes that predict or moderate treatment outcome for parent management training. This was somewhat surprising considering previous reviews that were able to identify such characteristics more definitively (Lundahl et al. 2006; Reyno and McGrath 2006). The difference in findings may, at least partially, be accounted for by the smaller number of studies identified in the current review (21) versus those examined by Lundahl et al. (2006) and Reyno and McGrath (2006) (63 and 31, respectively). Importantly, few of these earlier reviews included familial and parental variables. Lundahl et al. (2006), for example, only examined two familial/parental moderator variables—SES and single parenthood—meaning that while the number of studies examined was greater, the variables analyzed were limited. Interestingly, our findings for moderators was similar to the more recent review with younger children that also found little consistent evidence for differential effectiveness for treatments across sociodemographic and family processes (Shelleby and Shaws 2014). Nevertheless, the smaller pool of studies in the current review may have reduced the capacity to find consistent patterns of results, and, therefore, to make definitive conclusions. Further research into parental and familial predictors and moderators is greatly needed.

While a significant amount of research has been conducted since the 2006 reviews (see Fig. 1), the majority of this research has not explored parental and family processes.

For example, and surprisingly so, Triple P and PCIT only examined such variables in one of the reviewed studies each (Dittman et al. 2014; Werba et al. 2006). Interestingly, previous reviews also identified very few PCIT and Triple P studies examining parental and familial predictors and moderators; specifically, only three Triple P and five PCIT studies were identified in the earlier reviews (Bor et al. 2002; Brestan et al. 1997; Capage et al. 2001; Eyberg et al. 1995; Hoath and Sanders 2002; Hood and Eyberg 2003; Lundahl et al. 2006; McTaggart and Sanders 2007; Reyno and McGraths 2006; Schuhmann et al. 1998; Shelleby and Shaw 2014). In addition, similar to the current review, parental and familial predictors and moderators were most typically examined by IY studies, with ten being identified (Gross et al. 1995; Tucker et al. 1998; Webster-Stratton 1982a, 1982b, 1984, 1990, 1992, 1998, 1998; Webster-Stratton and Hammond 1997).

As previously mentioned, parents play a crucial role in PMT interventions—they are the primary agents of change—therefore, identifying pre-treatment characteristics that may impact their ability to successfully engage, participate in, and implement treatment is vital to increasing our understanding of the mechanisms of change and how to improve treatment outcomes. Thus, it is imperative that future research continue to systematically identify variables that both are conceptually and empirically associated with treatment outcomes (Prins et al. 2015) and that this examination is conducted across all types of PMT.

Limitations

Methodological features may be important in accounting for our differential findings (Wilson and Lipseys 2001). In the current review, child conduct outcomes were examined, utilizing different methods across different studies to measure similar behaviors. For example, some studies looked at categorical outcomes, such as the presence of a diagnosis using clinician-rated semi-structured interview measures, while others used observational measures and parent-report measures. Dimensional ratings from parents or teachers were the most frequently employed in the majority (62%) of the studies in the current review. This may have resulted in a treatment bias effect, whereby participants may have overestimated rates of improvement due to demand characteristics and the desire to demonstrate improvement (Loerinc et al. 2015; Reyno and McGrath 2006). Furthermore, specific parent-rated dimensional scales, such as the ECBI, are usually more precise and sensitive to change and, therefore, more likely to identify predictors of treatment outcome (Steketee and Chambless 1992). This was reflected in the current review with 73% of studies that employed the ECBI as an outcome measure, yielding significant findings. This included studies that used more than one outcome measure

but only attained a significant finding on the ECBI (e.g., Fossum et al. 2008). In addition, while only a small number of studies employed direct behavioral observations as an outcome measure, it has been suggested that such measures may be more sensitive to intervention effects in comparison to parent reports of child behavior (Scott 2001). Quite obviously, use of different outcome measures across studies can be problematic, making it difficult to meaningfully synthesize and interpret data.

A further limitation is that over a third of the studies included in the present review may have been underpowered ($n < 100$), making it difficult to ascertain whether the results reflect effects associated with true prediction or moderation. Further, compounding this, most papers did not report effect sizes, again making it difficult to interpret the magnitude of findings. Additionally, relatively few predictors were examined, with even fewer moderators. An early study by Lavigne et al. (2008) may be considered exemplary as a predictor and moderator study. In this study, participants received either a minimal intervention bibliotherapy treatment or the Incredible Years program led by a nurse or psychologist. More than one outcome measure was used, with data collected from different informants, including a semi-structured interview, parent self-report measures and videotaped observations of parent–child interactions. In addition, a range of predictors and moderators were explored. They included previously identified risk factors such as SES and maternal depression (Burke et al. 2004; Murrihy et al. 2010), as well as variables such as parental commands and parent–child interactions, which are specifically targeted during these interventions. Unfortunately, their sample size was moderate ($n = 117$), making it more difficult to detect moderation.

In another exemplary effort, Beauchaine et al. (2005) aggregated six Incredible Years studies which resulted in a large sample size ($n = 514$). They also examined a range of parental and familial characteristics as predictors and moderators and were able to detect significant findings for both. That is, (younger) age and parental substance abuse history predicted better outcomes one-year post-treatment. In addition, SES, maternal depression, single-parent status, history of parental substance abuse and low marital adjustment, moderated treatment outcome. Collectively, these studies may provide a sound methodological framework for the examination of predictors and moderators to maximize the likelihood of attaining valuable findings.

It should be noted that with the over-representation of IY studies may also influence findings in the current review. For example, different components of parent training, such as the use of time-out and increasing positive parent–child interactions, have been found to be more effective than others (Kaminski et al. 2008). It is possible that treatment characteristics that are specific to the intervention may account for some of the variability in the findings of the current review

because PMT interventions vary in their program content and delivery.

The results of this review need to be interpreted in the context of additional limitations. First, for practical reasons, only studies that were published in English were included. Second, our search was restricted to a limited set of databases (PsychINFO, MEDLINE, SCOPUS and CENTRAL). Although we attempted to address this by examining the reference lists of previous reviews, as well as searching online PMT libraries and Google Scholar, we may have inadvertently omitted articles that met our inclusion criteria because of our restricted search. The exclusion of Intermittent Explosive Disorder may have also resulted in the identification of fewer potentially relevant studies. A related limitation is that there were relatively few studies that met the inclusion criteria. This made it difficult to interpret and integrate the data. Furthermore, due to the characteristics of the studies, it was not possible to conduct a meta-analysis, which is the preferable method of data synthesis taking account of effect sizes and sample sizes of the individual studies. Also, the quality of the studies varied, with 18 of the studies rated as having low risk of bias on three or more individual categories (see Fig. 2). However, for the overall risk of bias ratings, nine of the studies were assessed as having high concerns for risk of bias and six studies were assessed as having some concerns. The main potential source of bias was contained in the measurement of the outcome domain. This was largely attributed to outcome assessors not being blinded to intervention assignments. For example, the majority of the studies used parent self-report measures, and in some studies, the assessor was either aware of the intervention status or it was not clear if the assessors were aware of the intervention status. Findings must therefore be interpreted within the context of these potential limitations. However, a strength was that a risk of bias analysis was conducted. In addition, adding to previous research and in contrast to previous reviews (i.e., Lundahl et al. 2006; Reyno and McGrath 2006), the examination of parental and familial variables in relation to child outcomes of PMT, was unrestricted. This review clearly identifies an important gap in the literature and highlights the need for future studies to examine both predictors and moderators that include parental and familial characteristics.

Future Directions

Further research into the impact of parental factors in the treatment of CPs would be of benefit to advance the field and improve interventions to better serve the needs of families of children with CPs. In order to advance our understanding of how we improve the rates of treatment response, we need to routinely examine predictors and moderators in all future RCTs. Although it is encouraging that a number of risk factors explored in the current review did not differentially

impact PMT effectiveness, it does not further our understanding as to why some families respond and other families fail to respond following treatment. Perhaps, the literature has yet to identify the most salient predictors and moderators, or those that show promising results require further investigation and replication (e.g., parent–child interactions). For example, father and mother involvement in parent training has been identified as resulting in significantly more positive change in child behavior and desirable parenting practices, compared with mother-only programs (Lundahl et al. 2008). Yet, research exploring parenting interventions has typically focused solely on mothers, with many relying on maternal reported outcome measures (e.g., Kjøbli et al. 2014; Scott, 2005; Seabra-Santos et al. 2016; Werba et al. 2006). Father participation may be critical for determining intervention effectiveness, especially so for parenting interventions for child conduct problems, and further research to clarify this would be beneficial (Tully et al. 2017). On the other hand, it should not be overlooked that parenting/familial variables are not the only predictors of parenting interventions—child characteristics (e.g., initial problem severity, comorbidity) or process related factors (e.g., lack of engagement in intervention or poor therapeutic alliance) may also account for why many participants do not respond to parenting interventions.

Future studies should also consider the need for consistency in measurement across studies. As previously mentioned, outcome measures used in the studies in this review varied greatly, making it difficult to synthesize the findings. In addition, future research would benefit from standardized inclusion criteria. For example, child conduct problems at pre-treatment have been shown to predict parent training effectiveness (e.g., Leijten et al. 2013; Weisz et al. 2005), with studies requiring a diagnosis likely containing participants with more severe initial conduct problems compared to those relying on parent reported questionnaires of behavior. Statistically, individuals with more severe problems before beginning treatment have a larger scope for improvement and, thus, increase the likelihood of obtaining larger effects (Shelleby and Shaw 2014). Clinically, families that are troubled the most by their child's behaviors are also more likely to see the importance of engaging in the parent training and may be more motivated to get the most out of the experience (Leijten et al. 2013), as reflected through higher attendance rates and treatment adherence (Baydar et al. 2003). Future studies may therefore aid the development of our understanding of treatment predictors and moderators by using similar populations across studies, specifically, with similar initial levels of conduct problem severity.

Finally, it would be useful to explore alternative methods of parent training that address variables, such as parent–child relations, that have been shown by this review as the most reliable predictors of treatment outcomes (Dittman

et al. 2014; Lavigne et al. 2008; Miller-Slough et al. 2016). Emanating from the belief that ODD-related behaviors stem from parent–child incompatibility, Collaborative and Proactive Solutions (CPS; previously referred to as Collaborative Problem Solving, Greene 2011; Greene and Winkler 2019) may be a viable treatment option for oppositional children and their families (Greene and Winkler 2019; Ollendick et al. 2016). Within this model, parent–child incompatibility refers to instances where parental expectations being placed upon a child outstrip the child’s skills to respond adaptively, resulting in disruptive behaviors (Greene and Winkler 2019). Parent–child incompatibility is directly addressed by CPS through a process of collaborative problem solving. Examination of predictor and moderator variables are desperately needed in comparing this approach to standard PMT approaches.

In sum, future research may benefit from routinely examining a range of predictors and moderators, including parental and familial characteristics. Also, standardization of research methodology (e.g., outcome measures) would assist in the synthesis of findings across studies, thereby increasing our understanding of predictors and moderators of treatment outcome in children presenting with CPs. Finally, alternative interventions to PMT that specifically address factors that have been identified as impacting treatment outcome should be considered.

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Compliance with Ethical Standards

Conflict of interest All authors declare that they have no conflict of interest.

Ethical Approval This article does not contain any studies with human participants or animals performed by any of the authors.

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