Predictors of Behavior Parent Training Treatment Engagement and Satisfaction in Families with Young Children with Developmental Delays

by

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DISSERTATION ABSTRACT

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Title: Predictors of Behavior Parent Training Treatment Engagement and Satisfaction in Families with Young Children with Developmental Delays

Parents of young children with developmental delays (DD) often experience higher rates of stress and depression (Feldman et al., 2007; Neece et al., 2012; Scherer et al., 2019), and children with DD often experience more severe behavioral challenges as compared to typically developing peers (Neece et al., 2012; Ros-DeMarize et al., 2023). Behavior Parent Training (BPT) is a widely used intervention tool to address child challenging behaviors, yet often families face barriers which prevent consistent engagement in intervention. This study examined associations between engagement (attendance and satisfaction), parent mental health (stress and depression), child behavior problems, and socioeconomic contextual factors (household income). Baseline mental health and income appeared to matter most at the intervention initiation stage, while attendance dose among engaged caregivers showed minimal association with child behavior and caregiver mental health. Non-engaged caregivers reported lower household income, higher depressive symptoms, were less likely to be married, and were less likely to have a child with a global developmental delay (versus specific delay such as speech delay). Engaged caregivers who reported higher baseline stress had lower satisfaction scores; however, treatment satisfaction was consistently high across caregivers who attended sessions, indicating strong acceptability of the BPT program.

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CHAPTER 1

INTRODUCTION

Background

Behavior Parent Training (BPT)

When it comes to supporting families experiencing child challenging behavior, Behavior Parent Training (BPT) is widely regarded as one of the most effective interventions for addressing these challenges (McCart et al., 2006; Wyatt et al., 2008). BPT is considered the "gold standard" intervention for supporting parents of children with challenging behaviors, including children with a developmental delay (McIntyre, 2013; Skotarczak & Lee, 2015). Developmental delay (DD) is a term used to describe when a child is not meeting developmental milestones as compared to their same-age peers during early childhood (Choo et al., 2019). A recent study described that developmental delays occur in approximately 10-15% of preschool children (Choo et al., 2019).

BPT programs aim to support parents with evidence-based strategies in order to prevent and reduce their child's problem behavior. BPT programs often utilize reinforcement of positive child behaviors to reduce maladaptive behaviors (Hornstra et al., 2023). Most BPT programs focus on using stimulus control strategies to prevent challenging behavior, such as having clear rules and expectations; and contingency management strategies, such as praising positive behavior and ignoring maladaptive behavior (Hornstra et al., 2023). The focus of BPT programs is to modify parent behaviors to promote desired child behavior (Hornstra et al., 2023). Evidence suggests that BPT interventions promote positive child behavior and with some evidence for reducing parental stress, resulting in an improvement on the overall parent-child relationship (Webster-Stratton, 2010).

Despite positive effects of BPT, barriers to consistent attendance and engagement in these programs remain prominent in community populations, thus limiting intervention effectiveness for families (Rostad et al., 2018).

Developmental Delays and Behavioral Problems

For children with DD, challenging behaviors can begin in early childhood and likely persist in the absence of targeted intervention (McIntyre, 2008). Children with DD tend to present with more severe behavioral problems as compared to their typically developing peers (Neece et al., 2012; Ros-DeMarize et al., 2023). Many children with DD struggle with aggression, impulsivity, communication difficulties, and emotional regulation, which can be difficult to manage without structured interventions (Ros-DeMarize et al., 2023). Problem behaviors can be especially overwhelming for caregivers with children with DD, as the behaviors may be more persistent and pervasive than behavior problems in children without DD (Ros-DeMarize et al., 2023). Furthermore, research suggests that behavioral problems in children with DD are associated with increased parenting stress and lower overall family functioning (Lavigne et al., 2010). When caregivers are stressed and overwhelmed, they may be less effective in responding to problem behaviors. However, studies indicate that BPT is effective in improving outcomes in families with DD, as long as the interventions are tailored to meet the specific needs of the family (Bagner & Graziano, 2013).

Behavior Parent Training for Children with Disabilities

Evidence supports the effectiveness of BPT programs for a range of populations, including those with and without disabilities (Baker et al., 2003; Webster-Stratton, 2010). Research has shown that BPT can significantly improve both child behavior and the parent-child relationship (Fischer et al., 2004; Gonzalez & Jones, 2016). That is, as parents learn to apply

structured and consistent strategies that promote positive behaviors and reduce family conflict, BPT interventions have resulted in improved parent-child interactions (Fischer et al., 2004; Gonzalez & Jones, 2016). Furthermore, studies have found that children who participate in BPT programs exhibit reduced aggressive behaviors, improved social skills, and improved emotional regulation skills (Bagner & Graziano, 2013). BPT programs, especially those based on the Webster-Stratton model, have demonstrated their effectiveness in clinical and community settings, showing long-term benefits for both the child and the parent (Webster-Stratton, 2010).

BPT has not only been shown to improve child challenging behaviors, it also has been shown to promote parents' confidence in their parenting abilities, which can buffer against feelings of helplessness which often experienced by parents faced with the challenges of raising a child with DD (Kim & Kim, 2011; Sullivan et al., 2021). That is, by increasing parents' skills and to promote structured home environment, BPT programs can reduce parental stress and improve overall family dynamics (Lavigne et al., 2010).

Mental Health in Families of Children with Developmental Disabilities

Parents of children with developmental delays often present with greater levels stress as compared to parents of typically developing children (Baker et al., 2002; Webster et al., 2008; Lavigne et al., 2010). Parental stress has been defined as the distress or discomfort that results from the challenges and demands intrinsic in the role of parenting (Deater-Deckard, 1998). As such, the persistent demands of parenting a child with severe challenging behaviors can intensify the emotional strain on families with DD, resulting in increased parental stress. Parents who manage frequent tantrums, aggression, or noncompliant behaviors on a day-to-day may become exhausted or overwhelmed. It is common in this population for parents to experience greater burnout, anxiety, and depression (Scherer et al., 2019).

Stress

Research has demonstrated that parents of children with DD are more likely to experience high levels of stress and depression than parents of children without DD (Feldman et al., 2007; Neece et al., 2012; Scherer et al., 2019). Studies have shown that child challenging behaviors result in more demands on caregivers, often resulting in increased levels of parental stress and emotional burden (Baker et al., 2002; Paczkowski & Baker, 2008). Further, children with DD have been shown to be three to four times more likely to have clinically significant behavioral concerns than children without DD (Baker et al., 2002), which further underscores the need to support parents of children with DD.

Heightened parental stress can result in sleep deprivation, reduced social support, and financial strain (Lavigne et al., 2010). The stress can in turn can impact a parent's ability to seek support and engage with interventions such as BPT. Parental stress can also interfere with parents' ability to implement the strategies learned in BPT sessions (Neece et al., 2012; Osborne et al., 2008). Further, parents who are emotionally drained or overwhelmed may not have the energy or motivation to attend sessions on a regular basis or to implement new techniques at home, which can result in disengagement from the intervention (Neece et al., 2012). However, Bussing (2020) suggests that incorporating stress management strategies and opportunities for peer support among parents may mitigate emotional strain and improve overall treatment outcomes.

Depression

Parenting stress and parental depression have bidirectional relationship. Meaning, high levels of stress can lead to depression, and depression can intensify feelings of stress and burnout (Neece et al., 2012), which can make it more challenging for parents to engage in BPT programs.

Neece et al. (2012) suggests that depression can reduce motivation, energy levels, and prevent parents from attending sessions or fully participating in treatment.

Yet, research has shown that even when parents experience depression, BPT can still be an effective way to reduce child behavior problems and improve parenting skills (Bussing, 2020). Bussing (2020) found that while parental depression may impact initial engagement in treatment, the long-term benefits of BPT are largely the same. This suggests that although depression symptoms may prevent parents from showing up for treatment, BPT can still be highly effective on improving both child behavior and parent mental health.

Barriers to Behavior Parent Training Engagement

Child behavior problems require specialized interventions that are evidence-based and tailored to the unique needs of each family. However, given general lack of resources within communities (i.e., the number of clinicians available in the community, cost of individualized support), group-based BPT interventions are widely used to support these families in both community and clinical settings. As such, group-based BPT programs may not be as effective as individualized sessions in directly addressing a family's specific and unique needs.

Although BPT programs are effective in promoting positive child and family outcomes, many families struggle to consistently engage with these interventions. Attendance and engagement are crucial aspects to the effectiveness of BPT programs (Chacko et al., 2016). Common difficulties in BPT implementation include attrition, within-session engagement, attendance, and homework completion (Chacko et al., 2016). However, barriers to BPT attendance and engagement include logistical issues (discussed below) as well as emotional and psychological factors. Parents who are overwhelmed by their child's behavior or dealing with mental health issues, such as depression, may not prioritize attending sessions or fully participate

in treatment (Lavigne et al., 2010). These emotional and psychological factors often result in early dropout or inconsistent participation, which reduces the overall effectiveness of the intervention (Lavigne et al., 2010).

Chacko et al. (2016) reviewed treatment engagement in 262 BPT studies. They found that in 181 studies which measured attrition, on average 25% of families dropped out pretreatment, before starting intervention and another 26% begin treatment but drop out. They also found that of 61 studies which provided average attendance rates, the average rate of attendance was 72% across studies (Chacko et al., 2016); however, this is likely an overestimate because pre-treatment dropout rates are unaccounted for. This metanalysis highlights that a significant portion of families who are eligible for BPT never participate in any sessions, and of those who attended sessions, many did not fully participate in the entire intervention (Chacko et al., 2016).

Various contextual factors hinder BPT initiation and ongoing participation, particularly logistical issues (e.g., transportation difficulties, scheduling conflicts, and childcare needs), child behavior, parent mental health, socioeconomic status, parent perceived effectiveness and motivation, and barriers including cultural beliefs and stigma (Bagner & Graziano, 2013; Chacko et al., 2016; Ros et al., 2016). For many families, these barriers are overwhelming, particularly in low-income or under-resourced communities (Doffer et al., 2023; Weisenmuller et al., 2021). The financial costs of attending treatment, such as transportation, childcare, and out-of-pocket expenses, are primary deterrents which prevent some families from fully engaging in intervention (Weisenmuller et al., 2021). These financial barriers are often compounded by the mental health challenges faced by parents of children with DD, ultimately resulting in a lack of perceived urgency for attending treatment sessions (Ouellette & Wilkerson, 2008).

Further, research shows that parents who experience higher levels of stress and depression are more likely to disengage from BPT programs (Doffer et al., 2023). Doffer et al., (2023) suggests that parents may feel that their efforts will not yield results, which can diminish their motivation to participate in treatment. Thus, addressing both parent mental health and socioeconomic barriers are essential to improving attendance rates and overall program effectiveness.

Socioeconomic Status as a Barrier

Families from lower socioeconomic status (SES) backgrounds often face multiple barriers that prevent them from engaging in these interventions, including financial strain, limited access to transportation, and lack of insurance coverage (Correia et al., 2019). Financial barriers can prevent families from accessing services even when BPT programs are readily available their communities (Correia et al., 2019).

Chacko et al. (2016) examined moderators of BPT attrition across 262 studies and found that SES was the only moderator that significantly correlated with attrition. They found that studies conducted with predominately lower SES populations resulted in higher attrition rates on average (34%), and lower attendance rates (66%) (Chacko et al., 2016). Letourneau et al., (2013) also found that families with lower SES backgrounds were less likely to engage in behavioral interventions and reported lower satisfaction with treatment compared to higher SES families (Letourneau et al., 2013).

Implementation Science Perspectives on Engagement and Satisfaction in BPT

Consolidated Framework for Implementation Research (CFIR)

There are many factors that can influence BPT engagement, and careful considerations must be taken when evaluating multilevel contextual factors that may influence both engagement

and satisfaction beyond individual parent or child characteristics. Implementation science frameworks provide an analytical lens for conceptualizing engagement as a function of contextual, organizational, and individual determinants; particularly CFIR which has been used to evaluate barriers and facilitators in the success of community implementation efforts (Damschroder et al., 2009; Damschroder et al., 2022). CFIR strives to evaluate the real-world factors that can shape implementation outcomes and participants' engagement interventions in the community (Damschroder et al., 2009). CFIR suggests levels of factors that influence treatment outcomes including the outer setting, inner setting, intervention characteristics, the implementation process, intervention characteristics, and individual characteristics that shape intervention implementation outcomes (CFIR, 2025; Damschroder et al., 2022).

CFIR is a useful tool to examine predictors of attendance dose of group-based BPT programs for caregivers for children with DD. Differences in BPT in initial intervention engagement may relate to CFIR domains in the Outer Settings, such as access to community resources, seriocomic constraints, or external pressures and incentives (CFIR, 2025). This is particularly important to consider, as families with more financial insecurity may be more heavily incentivized to participate in an intervention which offers incentives (e.g., honoraria) for participation. Additionally, parents of children with challenging behaviors may also feel more pressured to seek support by professionals or family and friends. CFIR domains related to Characteristics of the Individual, such as parental stress or depression, may be predictive of *initial* intervention engagement. Whereas *continued* engagement and intervention satisfaction may be more related to Intervention Characteristics such as the design, content, and evidence-basis (CFIR, 2025). Continued attendance may be influenced by Inner Setting supports such as culture and readiness, and Process which includes the planning and execution of the intervention,

engagement, and reflecting and evaluating (CFIR, 2025). From an CFIR perspective, attendance can be conceptualized as an implementation outcome related to intervention dose, while satisfaction aligns with client outcomes as defined in Proctor and colleagues' taxonomy of implementation outcomes.

Proctor's Taxonomy of Implementation Outcomes on Attendance and Satisfaction

Proctor and colleagues (2011) taxonomy of implementation outcomes provides a conceptual framework for implementation research to evaluated success through three key domains: implementation, service, and client outcomes. Proctor and colleagues (2011) taxonomy identifies key implementation outcomes to identify intervention success, which are: acceptability, adoption, appropriateness, cost, feasibility, fidelity, penetration, and sustainability (Proctor et al., 2011). Fidelity is considered the degree to which an intervention is delivered and received as intended and is frequently evaluated as an implementation outcome in BPT research through session attendance and participation. Proctor's framework (2011) also specifically identifies treatment satisfaction as a key client outcome, which is also remarked as an important indicator of intervention success.

Within the context of BPT, attendance serves as a proxy for treatment fidelity, as attendance is essential for caregivers to acquire skills and strategies to implement at home. Intervention satisfaction on the other hand, reflects a caregiver's perceptions of the relevance, utility, and acceptability of the intervention. In the context of BPT satisfaction serves as the proxy for client outcomes. Proctor's framework (2011) serves as a useful tool in evaluating BPT treatment success, for both implementation outcomes (e.g., attendance) and parent outcomes (e.g., intervention satisfaction), which is utilized in the conceptualization of engagement and satisfaction of the current study.

Parent Treatment Satisfaction

Parent-reported treatment satisfaction is a crucial aspect in the evaluation of intervention success. Evaluating parental satisfaction provides insights into barriers that that parents may face, so that programs and interventionists may address to better support families and promote positive outcomes (Bjorknes & Ortiz-Barreda, 2021). However, parent treatment satisfaction is often understudied in BPT, and even more limited within the context of BPT satisfaction for caregivers of children with developmental delays. Bjorknes & Ortiz-Barreda (2021) sought out review satisfaction among parents who engaged in parenting programs for families with child conduct problems, broadly. In their review of 420 papers, only 23 measured parental satisfaction; including the Consumer Satisfaction Questionnaire (N=3), and The Incredible Years Program Satisfaction Questionnaire (N=2). However, within these 23 studies, all found that parents were "very satisfied" with the BPT they received (Bjorknes & Ortiz-Barreda, 2021).

Within Proctor's framework, client satisfaction is an essential intervention aspect in the evaluation of clinical effectiveness (Proctor et al., 2011). A recent study on treatment satisfaction among caregivers of children with DD utilizing parent-child interaction therapy (PCIT) via telehealth found parents reported high satisfaction with treatment (Bagner et al., 2023). Their sample consisted of predominantly "ethnic/racially minoritized or immigrant backgrounds," and the authors suggest incorporating cultural factors into BPT development but did not discuss the satisfaction data in detail (Bagner et al., 2023). A previous study evaluating parenting self-efficacy in a population of parents of children with autism spectrum disorder found that parents who were more engaged in treatment reported greater self-efficacy and satisfaction (Kurzork et al., 2021). As one would expect, engagement in BPT supports parents with skill acquisition which likely increases likelihood of satisfaction and self-efficacy.

Statement of the Problem

The literature shows that BPT is an evidence-based strategy to improve child challenging behavior and reduce parental stress, including for families of children with DD. Previous studies have demonstrated that parental mental health, socioeconomic status, and logistical barriers influence BPT attrition and attendance (Bagner & Graziano, 2013; Lavigne et al., 2010). While we know that parents of children with DD face additional obstacle and are at higher risk for negative family outcomes, we have yet to fully examine the barriers to treatment engagement in this specific population. Further, we have yet to comprehensively explore treatment satisfaction of parents with children with DD, who may have more individualized needs, and thus may report lower satisfaction. Therefore, it is crucial that we investigate factors that influence these caregivers' perceptions and participation in BPT, so that we may appropriately adapt interventions to meet the needs of this population and promote treatment adherence.

The Current Study

When families are unable to access or consistently engage with BPT programs, even the most well-designed and evidence-based interventions fail to reach their intended populations and achieve their intended goals. Lack of attendance results in a waste of valuable resources and prevents families from receiving the support they need. Increasing our understanding of the barriers associated with treatment engagement is essential for improving the accessibility and effectiveness of BPT programs for families with children who have DDs.

This study examined the specific barriers to BPT program engagement for families of children with DDs involved in a randomized controlled trial evaluating the effects of BPT on child behavioral health. By exploring the relationships between parent, child, and contextual

variables, the study provides insights into how to improve BPT interventions to increase accessibility and engagement.

Research Questions

The primary goal of this study was to investigate variables associated with treatment attendance and satisfaction. Descriptive analyses were conducted first to understand attendance across sessions and satisfaction across sessions. Additional research questions focused on parent, child, and contextual variables associated with treatment engagement and are listed below:

1: *What is the association between parent mental health and treatment engagement (attendance and satisfaction) in BPT for young children with developmental delays?*

> **Hypothesis 1a:** It was hypothesized that parent depression will show a negative association with attendance rates in the BPT program.
>
> **Hypothesis 1b:** It was hypothesized that parent stress will show a negative association with attendance rates in the BPT program.
>
> **Hypothesis 1c:** It was hypothesized that parent depression will show a negative association with satisfaction rates in the BPT program.
>
> **Hypothesis 1d:** It was hypothesized that parent stress will show a negative association with satisfaction rates in the BPT program.

2*: What is the association between child behavior problems and parental treatment engagement (attendance and satisfaction) in BPT for young children with developmental delays?*

> **Hypothesis 2a:** It was hypothesized that child behavior problems will show a positive association with parent attendance rates in the BPT program.
>
> **Hypothesis 2b:** It was hypothesized that child behavior problems will show a positive association with parent satisfaction rates in the BPT program.

3. *What is the relationship between household income and treatment engagement (attendance and satisfaction) in BPT for parents of children with developmental delays?*

Hypothesis 3a: It was hypothesized that family income will be positively associated with attendance rates in the BPT program.

Hypothesis 3b: It was hypothesized that family income will be negatively associated with satisfaction.

4. *Taken together, what parent, child, and contextual variables predict treatment attendance?*

CHAPTER 2

METHOD

Participants and Setting

Participants were parents of preschool-age children with DD and their child participating in the Oregon Parent Project (R01 HD059838; McIntyre, PI), a randomized controlled trial which aimed to evaluate the effects of a parenting training program on child behavioral health outcomes. These families were recruited from early intervention providers and early childhood education centers to participate in the study.

Protocol

Eligible families provided consent for screening and randomization to either an intervention (BPT) condition or an assessment only condition as part of their participation in the Oregon Parenting Project. Given that the current study examined treatment engagement, only the 90 families randomized to the intervention condition were included as participants in the current study.

This study used previously collected data. Baseline data were used to measure parent mental health, child behavior, and household income; treatment engagement and satisfaction were measured using weekly satisfaction questionnaire and attendance data. Overall satisfaction was assessed at the conclusion of the 12 intervention sessions.

Measures

Demographic Questionnaire (DQ; project developed). The primary caregiver completed a demographic questionnaire during the baseline visit. Demographic items were collected on both parent and child characteristics. Child demographic variable included gender, age,

race/ethnicity background, and diagnoses of the child. Parent demographic variables included their gender, age, race/ethnicity, educational background, annual household income.

The Parenting Stress Index (Abidin, 2012) was used to assess and measure baseline parental stress. The PSI was designed to be a screening and diagnostic tool evaluating the stress experienced by parents. The PSI contains 101 items and is a norm-referenced tool that evaluates parenting stress associated with parental attributes, dysfunctional parent-child interactions, and child difficulties. The PSI was designed for parents of children aged 1month to 12 years. The PSI Total Stress score combines parent and child domains, as well as parent subscales and child subscales. Child subscales include Acceptability, Adaptability, Demandingness, Distractibility/ Hyperactivity, Mood, and Reinforces Parent. Parent subscales include Attachment, Competence, Health, Isolation, Role Restriction, and Spouse/Parenting Partner Relationship (Johnson, 2015). Additionally, studies have found that scores on the PSI are highly correlated with scores on the CES-D (Beck et al., 1988, as cited by Abidin 2012). Reliability for the PSI was high for both Parent and Child domains (α = .96), as well as Parent and Child combined (α = .98) in the current sample and consistent with other studies (Johnson, 2015).

The Child Behavior Checklist for Ages 1½-5 (CBCL; Achenbach 2000), was used to evaluate parent-reported child challenging behavior and challenging behavior severity. The CBCL contains 99 items and parents rate child behavior problems using a 3-point scale of "not true," "somewhat or sometimes true," or "very true or often true." The CBCL provides a Total Problem score and subscale scores for externalizing and internalizing behaviors and includes six clinical scales that map onto specific diagnoses (Achenbach & Rescorla, 2001). Previous studies demonstrate that the CBCL has good validity, and test-retest reliability scores of 0.68 - 0.92 (Achenbach and Rescorla, 2001).

Center for Epidemiological Studies Depression Scale (CES-D) (Radloff,1977) was used to assess parent depression scores. The CES-D is a norm-referenced, self-report measure used to assess depressive symptomatology. Parents in this study rated the frequency of depressive symptoms experienced over the previous week. Raw scores denote greater depressive symptoms experienced by the rater. There are 20 items on this questionnaire and parents responded using a four-point Likert-type scale ranging from 0 (Rarely or None of the Time) to 3 (Most or Almost All the Time). The CES-D demonstrated adequate reliability (total r=0.57), and validity in the general population was found to have suggested cut-off scores of greater that 16 with Sensitivity of 0.95 and Specificity of 0.29 (Radoff, 1977).

Attendance Logs (Program developed) were used to evaluate the number of scheduled BPT sessions attended. Weekly attendance was taken by study staff and used to evaluate how many of the 12 weekly sessions each parent attended.

Weekly Satisfaction Rating Scale (program developed): Each week parents completed a short satisfaction questionnaire that included four questions asking about the helpfulness of 1) content, 2) therapist, 3) group discussion, and 4) video vignettes A 4-point scale was used for each item. Higher scores indicated higher satisfaction (4 = very helpful; 3 = helpful; 2 = neutral; 1 = not helpful). These weekly satisfaction surveys were administered only to parents who attended the intervention session. Thus, these data were missing for parents who were absent for any given session.

Consumer Satisfaction Questionnaire An adaptation of the Consumer Satisfaction Questionnaire (CSQ; Forehand & McMahon, 1981) was used to assess overall satisfaction with the intervention and assessed parents' perceptions of the group leader's effectiveness, the group dynamics, the videotape vignettes, the usefulness of the content covered, and the effectiveness of

the program's methods. The CSQ contains 44 items assessed on a 7-point scale. Previous studies (e.g., McIntyre, 2008a, 2008b) examined five summary scales: overall program satisfaction, program usefulness, leader/therapist satisfaction, satisfaction with teaching tools, and specific parenting strategies/techniques. In the current study, a data reduction approach was used to determine whether an overall satisfaction scale score encompassing all 44 items was warranted. The limited sample size precluded a principal components analysis as evidence of a single overall factor structure. However, examination of the inter-item correlations for the five summary scales (average $r = .40$) provided some evidence for a single overall factor. The 44-item satisfaction score had Cronbach's $\alpha = .89$, and the single-factor overall satisfaction score was used to test the study hypotheses.

Data Analysis Plan

Prior to testing the study hypotheses, missing data were summarized, and outcomes were screened for normality using histograms, Q–Q plots, and measures of skew and kurtosis, and screened for outliers. Next, a comparative analysis of the sample was conducted by intervention engagement status. Engagement status was defined as caregivers who did not attend any BPT sessions ($n = 33$, 37%) and those who attended at least one session ($n = 57$, 63%). To better understand which caregiver and child characteristics were associated with engagement in the BPT sessions, grouped t-tests and chi-square tests were used to compare groups on contextual variables, parent mental health, and child behavior problems.

Tests of the study hypotheses were restricted to the 57 parents who attended at least one BPT session. All models were estimated in the R statistical computing environment. For attendance, the zero-truncated negative binomial (ZTNB; Zeileis et al., 2008) with a log link and maximum likelihood estimation was used and implemented in the *countreg* package (version

3.16.0). Incident rate ratios (IRRs) and 95% confidence intervals were used to interpret effects. McFadden's R^2 was used to assess model fit, as it is the most commonly reported pseudo-R^2 measure for maximum-likelihood count regression models and provides an interpretable analog to OLS R^2 based on the ratio of log-likelihoods (McFadden, 1973). Four univariable models were estimated to evaluate the unique effect of parent mental health, child behavior problems, and household income on attendance (Hypotheses 1a, 1b, 2a, 3a). Pearson correlations were used to assess the unique associations among parent mental health, child behavior problems, and household income (Hypotheses 1c, 1d, 2b, 3b).

To address missing satisfaction data, multiple imputations were performed using the mice package (version 3.16.0), yielding 25 fully imputed datasets to ensure adequate statistical efficiency and reproducibility (White et al., 2011). The imputation model included all demographic variables, baseline measures of parent mental health and child behavior problems (as shown in Tables 2 and 3), and in-session satisfaction ratings. 31 participants completed the consumer satisfaction survey; the rest were imputed.

Sensitivity analysis was estimated using PASS (Version 2023; NCSS, LLC). All power analyses assumed a Type I error rate of 5% (p <.05) and power greater than 80%. For t-tests and chi-square tests comparing engaged and not-engaged parents, the study had adequate power to detect medium-to-large effects (d > .65) for continuous measures and medium effects (W > .35) for categorical measures. For tests of the study hypotheses (restricted to 57 participants), the study had adequate power to detect medium effects for Pearson correlations (r > .38). The study is potentially underpowered to detect some meaningful differences between engaged and not engaged parents, and most likely underpowered to detect meaningful relationships when evaluating study hypotheses. Thus, for this study, all effects that are greater than halfway

between a small and medium effect size or greater were interpreted. This magnitude of effect size was chosen because it is neither so small as to be trivial, yet may be large enough to signal a meaningful relationship among parent mental health, child behavior problems, household income, and treatment engagement. Based on the seminal work of Cohen (1988), halfway between a small and medium effect is $d > .30$, $W > .20$, and $r > .20$. No formal effect-size conventions are established for IRRs; thus, results will be interpreted as percent changes in each additional session associated with each predictor.

CHAPTER 3

RESULTS

Preliminary Analysis

Complete data were available for the attendance outcome, demographic characteristics, parent mental health indicators, and child behavior problems. However, satisfaction data were missing for 32% of the parents who attended at least one session. Participants with versus without satisfaction data were compared with respect to observed baseline characteristics, parent mental health, and child behavior problems. Missing satisfaction data were significantly associated with marital status (OR = 0.56, 95% CI [0.36, 0.98]). Since the variable related to missingness was included in the imputation model, the missing at random assumption remains tenable.

A descriptive summary of the attendance outcome and satisfaction score is shown in Table 1. The histogram for the satisfaction outcome was approximately normal, measures of skewness (-0.04) and kurtosis (-0.50) were minimal, and the Q–Q plot showed a slight deviation from the reference lines in the tails. Overall, the plots and data suggest that the satisfaction outcome was approximately normally distributed. The histogram for the attendance outcome was flat, the measures of skewness (-0.47) were minimal, but kurtosis (-1.08) was more pronounced, and the Q–Q plot shows a slight deviation from the reference lines in the tails. Overall, the plots and data indicate that the attendance outcome supports the use of the ZTNB for this count variable. No outliers, defined as *z*-scores greater than 3.0 or less than -3.0, were found.

Engaged versus Non-Engaged Caregivers

Tables 2 and 3 show a comparison of caregivers by engagement status for categorical and continuous demographic variables, baseline measures of parent mental health, and child behavior

problems. Four notable differences were found. Marital status was related to engagement status (Cramer's V = .15). The observed proportions in Table 2 showed that caregivers who did not attend a session were less likely to be married (52% vs. 63%) and more likely to be divorced (18% vs. 2%) or single (18% vs. 13%). Additionally, caregivers who did not attend any sessions were less likely to report their child had a developmental delay (88% vs. 98%, Cohen's W = .22). The means in Table 3 show that caregivers who did not attend any sessions had a lower annual household income ($29,204 vs. $38,082, *d* = .32) and higher depression scores (15.5 vs. 11.7, *d* = .37).

Associations with Session Attendance

Table 4 shows univariable results from the ZTNB models predicting sessions attended. The estimated incidence rate ratios for caregiver stress, caregiver depression, and child behavior problems were slightly less than 1.0. This indicates minimal association between these measures and the number of sessions attended. For example, for each one-unit increase in parent stress, the expected number of sessions attended is multiplied by 0.998. This corresponds to approximately a 0.2% decrease ([0.988 – 1] × 100) in the expected number of sessions per one-unit increase in parent stress.

The estimated incidence rate ratio for household income was slightly greater than 1.0, also indicating a minimal association between household income and the number of sessions attended. For each one-unit increase in household income (i.e., every $10,000), the expected number of sessions attended increases by a factor of 1.002. This corresponds to approximately a 0.2% increase ([1002 – 1] × 100) in the expected number of sessions attended per $10,000 increase in income. These increases and decreases in sessions attended associated with the predictors are non-significant and trivial.

Associations with Satisfaction Score

Pearson correlations indicated a notable negative association between satisfaction ratings and parent stress (r = -.30, p = .061). This medium size effect indicates that the more stressed a parent was, the less satisfied they were with the BPT program. The Pearson correlations between satisfaction ratings and caregiver depression (r = -.15, p = .419), child problem behavior (r = -.13, p = .558), and annual household income (r = .11, p = .501) are all deemed trivial based on a priori interpretation guidelines provided above.

As shown in Table 1, the mean satisfaction score was 5.97 (SD = 0.37). The minimum satisfaction score was 5.04, and the maximum was 6.58; possible scores ranged from 1 to 7. Thus, independent of the associations, all caregivers found the program highly satisfying.

CHAPTER 4

PRESENTATION OF THE DATA

Table 1.

Descriptive Summary of Study Outcomes for Sample Used to Test Hypotheses (n = 57)

Attendance (n, %)		
1 session	3	5.3
2 sessions	4	7.0
3 sessions	5	8.8
4 sessions	1	1.8
5 sessions	4	7.0
6 sessions	4	7.0
7 sessions	4	7.0
8 sessions	5	8.8
9 sessions	5	8.8
10 sessions	8	14.0
11 sessions	10	17.5
12 sessions	4	7.0
Satisfaction [Mean, (SD)]	5.97	(0.37)

Note. Satisfaction descriptive statistics are pooled across the 25 imputed datasets.

Table 2.

Comparison of Caregivers by Engagement Status on Categorical Variables.

	Not Engaged (n = 33)		Engaged (n = 57)		Test Statistics		
	n	%	n	%	χ^2	p-value	ES
Child gender (% female)	6	18.2	17	29.8	1.49	.222	.13
Caregiver gender (% female)	33	100.0	52	91.2	3.07	.080	.19
Marital status							
Married	17	51.5	36	63.2	[a]**7.87**	**.096**	**.15**
Living together	3	9.1	6	6.7			
Separated	1	3.0	2	3.5			
Divorced	6	18.2	1	1.8			
Single	6	18.2	12	13.3			
Child's race							
White	31	93.9	52	91.2	0.21	.643	.05
Black	3	9.1	2	3.5	1.24	.265	.12
Asian	0	0.0	3	3.3	1.80	.180	.14
Native American	5	15.2	6	10.5	0.42	.519	.07
Pacific Islander	0	0.0	1	1.1	0.59	.444	.08
Other	0	0.0	2	3.5	1.18	.277	.12
Child's ethnicity (% Hispanic)	6	18.2	7	12.3	0.59	.443	.08
Caregiver race							
White	30	90.9	50	87.7	0.22	.643	.05
Black	2	6.1	1	1.8	1.20	.273	.12

Asian	0	0.0	2	2.2	1.18	.277	.12
Native American	4	12.1	2	2.2	2.49	.114	.17
Pacific Islander	0	0.0	0	0.0	—	—	—
Other	0	0.0	3	5.3	1.80	.180	.14
Caregiver ethnicity (% Hispanic)	4	12.1	7	12.3	0.01	.982	.01
Sibling(s) living at home	21	63.6	45	78.9	2.51	.113	.12
Child has developmental delay	29	87.9	56	98.2	[b]**4.28**	**.039**	**.22**
Child enrolled in school program	22	66.7	40	70.2	0.12	.729	.04
Enrolled with SPED eligibility	21	63.6	31	56.4	2.58	.275	.17
Receive services	23	69.7	48	85.7	3.30	.069	.19

Note. ES = effect size. Bolded test statistics are associated with approximately a small to medium effect size.
[a]Cramér's V with four degrees of freedom and follows the convention: .06 small, .17 medium, and .29 large.
[b]Cramér's V with 2 degrees of freedom and follows the convention: .07 small, .21 medium, and .35 large.

Table 3.
Comparison of Caregivers by Engagement Status on Continuous Variables.

	Not Engaged		Engaged		Test Statistics		
	Mean	SD	Mean	SD	t-value	p-value	d
Child's age in months	36.3	5.3	36.8	4.6	-0.43	.669	.09
Parent's age in years	31.8	9.3	31.6	6.5	0.11	.908	.03
Annual household income	29,204	25,747	38,666	32,082	**1.42**	**.159**	**.32**
PSI total percentile score	75.0	25.7	69.0	30.9	0.94	.348	.21
Caregiver CES-D	15.5	11.8	11.7	9.3	**1.68**	**.096**	**.37**
CBCL total problems T-score	60.7	13.7	60.1	11.6	0.22	.828	.05

Note. PSI = Parent Stress Index, CES-D = Center for Epidemiologic Studies – Depression, CBCL = Child Behavior Checklist. Bolded test statistics are associated with approximately a small to medium effect size.

Table 4.
Univariable Results for the Zero Truncated Negative Binomial Models Predicting Attendance

	Coef.	SE	p-value	IRR	95% CI	R^2
Parent Stress Index	-.001	.002	.594	0.998	[0.995, 1.003]	<.01
CES-D	-.003	.007	.683	0.997	[0.982, 1.011]	<.01
CBCL	<-.001	.006	.971	0.999	[0.988, 1.012]	<.01
[1]Household income	.002	.002	.386	1.002	[0.998, 1.006]	.04

SE = standard error, IRR = incidence rate ratio, CI = confidence interval, CES-D = Center for Epidemiologic Studies – Depression, CBCL = Child Behavior Checklist. Household income was divided by 10,000 prior to modeling.

CHAPTER 5

DISCUSSION

Children with DD often experience elevated behavior problems with their caregivers reporting heightened parenting stress. Paradoxically, this combination of factors may place them at increased risk for disengagement from behavioral interventions, which are designed to address these challenges. The present study examined predictors of intervention engagement and intervention satisfaction in a group-based BPT program, using The Incredible Years (IY) program, which was provided to families of preschool-age children with developmental delays as part of the Oregon Parenting Project. While there is strong evidence regarding the effectiveness of BPT programs such as IY, attrition remains a persistent challenge for group-based interventions. Further, there are many factors which may influence a family's initial engagement in intervention and the extent to which they attend weekly sessions.

Consistent with an implementation-focused perspective, intervention engagement was conceptualized as a multidimensional construct, including both attendance (intervention engagement and session dose) and treatment satisfaction (weekly satisfaction and consumer satisfaction). Predictors reflected parent-level (parenting stress and depressive symptoms), child-level (behavior problems), and contextual (household income) factors that have been theoretically and empirically linked to engagement in parent training programs (Weisenmuller & Hilton, 2021).

While 90 of the 180 caregivers were randomized into the intervention group, only 57 of these caregivers attended at least one session, meaning 36.7% of caregivers randomized to receive intervention never attended any sessions. By differentiating caregivers who did not attend any sessions (non-engaged) from those who engaged (engaged) in intervention sessions,

and by modeling attendance among attenders separately, the present study aimed to clarify which factors are associated with engagement in BPT for families of children with DD.

Summary of Key Findings

This paper revealed several key findings which expands current research for group-based interventions particularly for families with children with developmental delays.

Treatment engagement. Caregivers who did not attend (non-engaged) any BPT sessions differed meaningfully from those who attended at least one session. Non-engaged caregivers reported lower household income, higher depressive symptoms, and were less likely to be married. Further, non-engaged caregivers were less likely to report that their child had a global developmental delay (as opposed to other specific diagnoses such as speech delay).

Attendance/dosage. Among engaged caregivers (i.e., those who attended at least one session), baseline parenting stress, depressive symptoms, child behavior problems, and household income were not associated with the number of sessions attended. Effect sizes were small, and none of the predictors significantly explained variation in attendance dose. This suggests that once caregivers overcome barriers to attending the first session, then baseline parent, child, and contextual characteristics may be less relevant for continued attendance. The lack of meaningful findings for attendance made a multivariable examination of intervention attendance unnecessary, and therefore the last hypothesis was not tested.

Treatment satisfaction. Treatment satisfaction was consistently high across caregivers who attended sessions, indicating strong acceptability of the BPT program. The only association with treatment satisfaction was parenting stress, which indicated a small negative association with satisfaction. Those parents reporting more stress had slightly lower treatment satisfaction scores.

Depression, child behavior problems, and income were not meaningfully related to satisfaction. There was little variability in rating of satisfaction.

Caregiver Mental Health

Depressive Symptoms. Caregivers who did not attend any BPT sessions reported higher depressive symptoms at baseline than those who engaged in BPT sessions. Within the 90 caregivers randomized to receive BPT, 34% of caregivers had elevated symptoms of depression using the cut-score of 16 or higher on the CESD total score (Radloff, 1977). Thus, approximately one-third of the current sample reported elevated depressed symptomatology, which is consistent with previous studies of caregivers of young children with DD and higher than the rates of depression in the general public for adult women (e.g., Neece, 2012). Caregiving young children with disabilities may be an especially isolating experience and associated with heighted depressed symptoms.

In the current study, parent depression was associated with treatment engagement, which aligns with previous research suggesting that caregiver depressive symptoms may interfere with motivation, planning, and follow-through in engaging in intervention (Neece et al., 2012). Caregiver depression may intensify the caregiver's perception of pre-existing barriers, such as logistical stressors.

However, the current study found depressive symptoms did not predict attendance dose among caregivers who engaged in at least one BPT session. This pattern suggests that once caregivers attend at least one session, depressive symptoms alone may not substantially influence continued attendance. This finding aligns with previous studies, such as Bussing (2020), that suggested initial engagement was impacted by parental depression, however, once involved, it was no longer predictive of treatment benefits. Alternatively, the null findings may reflect

limited statistical power, or the influence of unmeasured contextual factors such as scheduling flexibility or program supports. Regardless, a key takeaway may be to support parents' initial treatment engagement through removing logistical barriers and supporting their motivation to change.

Parenting Stress. Parenting stress was not associated with treatment engagement or dose. However, parent stress did show a meaningful negative association with treatment satisfaction. This means that caregivers who reported higher stress also reported slightly lower satisfaction with the program. Even in the context of high overall satisfaction, caregivers with higher stress perceived the program as less satisfying. Parenting stress may influence satisfaction by applying additional burden to their cognitive and emotional load, making it more difficult for caregivers to perceive program content as manageable or immediately applicable (Rostad et al., 2018). This is consistent with previous research which suggest that parents who are stressed and overwhelmed may implement intervention strategies less often and may be more disengaged from BPT (Neece et al., 2012). This finding is consistent with transactional models of parent-child functioning, and prior research which has shown that elevated parent stress in families of children with developmental delays may be a barrier to treatment participation and engagement (Rostad et al., 2018; Scherer et al., 2019).

Given that satisfaction is a personal appraisal of perceived value, caregivers who reported elevated stress may not have valued the intervention as highly. The intervention was not designed to address parent stress or wellbeing, as it primarily focused on positive parenting and strategies to reduce child behavior challenges. Thus, highly stressed parents may not have received the same intervention benefits given that stress reduction was not a direct target of the intervention. Additionally, caregivers who experienced higher levels of stress may have had a

more negative outlook overall and therefore may have been more likely to report lower treatment satisfaction. One important caveat is that results suggest that across both high- and low-stress caregivers, intervention satisfaction was generally very high, suggesting that even high-stress caregivers were satisfied with the program.

Although satisfaction was generally high, the intervention did not focus on reducing caregiver stress and depression. For parents with elevated stress, an intervention that targets stress reduction directly may be more appropriate. Mindfulness-based stress reduction (MBSR) interventions have been effective in decreasing parent stress in parents of young children with DD (e.g., Neece, 2014). Future studies should work to address parent stress through strategies such as MBSR to improve parent stress reduction skills, which may result in increased treatment acceptability and satisfaction in BPT programs.

Child Behavior Problems

Contrary to hypotheses, child behavior problems were not significantly associated with attendance or satisfaction in the current study. While children with developmental delays may be at elevated risk for behavior problems (Baker et al., 2002, Baker et al., 2003), severity of child behavior alone may not drive BPT engagement. However, it should be noted that child behavior may influence engagement indirectly through its impact on caregiver stress, mental health, and daily demands. The current sample was a community sample that was not recruited based on clinically significant behavioral challenges. That is, elevated child behavior problems was *not* an inclusionary criterion. Although some children had elevated behavior problems, the majority of children did not and the average Total Problems score on the CBCL was in the normal range (less than 1 SD above the mean). Given the risk associated with developmental delay, the intervention could best be described as secondary prevention rather than treatment of clinical

levels of behavioral challenges. If this had been a clinical sample or if there was more variability in child behavior problems, then the results could have differed. Further, a lack of power could have impacted the results.

Intervention Engagement and Income

Household income differentiated caregivers who engaged in BPT from those who did not. Non-engaged caregivers were associated with lower annual income. This finding aligns with evidence that socioeconomic disadvantage is associated with higher attrition and reduced access to BPT (Ofonedu et al., 2017). Non-engaged caregivers were less likely to be married, which would also contribute to having a lower annual household income and may possibly impact caregivers' ability to attend a weekly session without a partner assisting with logistics and family support. The current findings are consistent with previous research which states socioeconomically disadvantages are fundamental barriers to intervention engagement (Chacko et al., 2017; Ofonedu et al., 2017). Financial stress, limited transportation, inflexible work schedules, and childcare needs may disproportionately affect lower-income families, particularly at the point of treatment initiation (Correia et al., 2019; Ofonedu et al., 2017; Weisenmuller et al., 2021).

Findings from the current study suggest conceptualizing engagement in BPT as a two-step process. First, *initial engagement*, meaning coming to at least one session. The most meaningful findings of this study were predictors of treatment engagement (engaged vs. non-engaged). Importantly, household income was no longer predictive of intervention attendance (or dosage) among caregivers who attended at least one session, highlighting the importance of addressing barriers to initial engagement. Findings underscore the need to support parents' initial engagement in intervention.

There may be additional explanations as to why caregivers randomized to receive BPT may not have engaged. Within the study sample, speech delay was most common parent-reported child diagnosis, and parents of these children may not have had as many concerns about their child. Parents who had children with global delays, or delays in two or more developmental domains, were more likely to attend intervention sessions. Although not assessed in the current study, these differences may suggest that parent perception and beliefs may have influenced intervention engagement. This key finding provides insight into barriers to intervention engagement may be shaped by caregiver mental health, socioeconomic context, and caregiver perceptions of their child's needs. Additionally, continued attendance may be shaped by other factors not captured by baseline characteristics (e.g., parent/child physical health, access to reliable transportation, work or school schedules, other children in the home, etc.).

The structure of the study and compensation schedule may have also factored into intervention engagement. It should be noted that caregivers received an honorarium/compensation for their participation in the assessments, but additional compensation was not provided for attending the weekly sessions. Caregivers were compensated the same regardless of the number of sessions attended. It is possible that lower income families may have been more influenced to complete the assessments, but perhaps did not prioritize intervention sessions in the same way. Further, there may have been very real barriers to attending weekly intervention sessions that were not accounted for in the current study, such as motivation, beliefs, and logistical considerations.

Although family income predicted treatment engagement, income did not predict attendance dose or satisfaction among caregivers who engaged in BPT. This may suggest the importance of considering how income drives access at treatment engagement stage rather than

during ongoing participation. Moreover income, especially among those with significant socioeconomic disadvantage, may be better described as structural barriers to engagement.

Study Strengths and Limitations

This study had a number of strengths, including the population, evidence-based intervention, and consideration of parent, child, and contextual risk. In terms of study population, the focus on caregivers of young children with DD addresses an understudied population in parent training program research and a population who is at increased risk for mental health concerns. Many BPT programs focus on clinical samples of children with externalizing disorders, but here the focus was a developmental risk sample using a secondary prevention approach. The study used a manualized evidence-based intervention which is widely used in community settings, such as Head Start programs. The research questions addressed issues relevant to delivery of intervention in community settings, namely intervention engagement, attendance, and satisfaction. This study added to the literature on these important elements to community-based delivery of evidence-based interventions. Predictors of treatment engagement are especially relevant for community providers working with high-risk samples who face barriers to access and care. Finally, the study examined predictors of treatment engagement, attendance, and satisfaction across caregiver, child, and contextual domains, which align with bioecological and implementation science frameworks.

Although there were notable strengths, the current study had several limitations. The sample size for hypothesis testing was modest, which limited power to detect small effects. Additionally, there was missing satisfaction data due to the consumer satisfaction survey being distributed at the final session to only those participants who were in attendance. Thus, even for those caregivers who engaged in treatment, there was substantial missing data because not all

caregivers attended all 12 sessions (or even the final session). Although this missingness was addressed through multiple imputation, this limitation in data collection introduces uncertainty. Attendance dose analyses were limited to caregivers who engaged in intervention, which appropriately reflects engagement but limits conclusions about predictors of overall engagement. Additionally, satisfaction data showed ceiling effects, which limited variability, and thus limits our understanding of factors that may predict intervention satisfaction. In their review of parent satisfaction data, Bjorknes and Ortiz-Barreda (2021) found high levels of satisfaction, which they similarly posed as a ceiling effect, and suggested that while parent voices are essential to BPT program delivery and effectiveness, future practices may consider additional measures to more adequately capture parent perceptions.

Household income was used to evaluate socioeconomic factors that influence engagement and satisfaction; however, income alone may not capture specific logistical barriers related to socioeconomic disadvantage. For instance, having reliable transportation or access to childcare may be more indicative of socioeconomic barriers to intervention engagement than income broadly. There are many factors to consider that may limit the generalizability of these finding across communities and treatment settings. First, while the study sample was representative of the local population, the sample was predominantly White/Caucasian (90.9%) and lower income, which limits generalization of findings across communities. Future studies should examine treatment engagement and satisfaction across racially and ethnically diverse communities and further examine barriers to intervention in order to further evaluate community-level contextual factors which may significantly influence engagement. Additionally, study findings may not generalize to routine community implementation settings with fewer supports. This randomized control trial aimed to promote engagement reducing seriocomic burdens by

providing families with dinner at the session, offering transportation assistance, and providing childcare on site. Within a community setting with limited resources, this may not be feasible, and socioeconomic burden may even more significantly impact engagement or satisfaction.

A major limitation is that this was a group-based 12-week intervention with a fixed schedule, which was not tailored to family-level factors. Meaning, if a family was randomized to receive intervention, but could not make it to the set day of the week (e.g., Wednesday at 5pm), this may have prevented them from attending sessions. Further, this was a community sample, there were not eligibility requirements for parent stress, depression, or child behavioral problems. The intervention was not aimed to directly target parent mental health, and therefore the study findings may not generalize to clinical populations of parents with depression or stress. This could be why parents reporting more significant stress rated satisfaction lower, because it did not include targeted stress reduction strategies. As such, many parents did not report significant behavioral challenges, and the IY program may be more adequately evaluated as a secondary prevention. Additionally, motivational strategies to promote or enhance engagement were not used. Honoraria were provided to those who completed assessment procedures, but were not provided honoraria for attending weekly sessions, which also limits the conclusions that can be drawn from the intervention dosage analyses.

Implications for Practice

Findings of the current study highlight that we must carefully contemplate contextual factors, systems, and strategies to support caregivers of children with developmental delays and consider how to mitigate barriers that prevent intervention engagement. Key findings of this study indicated that caregivers with lower household income, higher levels of parent reported depression, and being unmarried were significantly more likely to never attend a single session.

BPT programs may require early supports and efforts that target treatment initiation and engagement, particularly for single caregivers and caregivers who experiencing depression or socioeconomic barriers. Supporting caregivers who are less likely to attend by providing alternatives to weekly group-based intervention may better serve these individuals, such as engaging in individual intervention, more flexibility in weekly group meeting times, in-home treatment rather than going out into the community, as well as remote telehealth options.

Given that satisfaction scores were lower for caregivers who reported higher parenting stress, future studies could benefit from the incorporation of strategies to directly mitigate stress, such as mindfulness-based strategies or cognitive behavioral approaches. Intervention strategies such those employed by Buric et al. (2025), which used mindful-based intervention strategies paired with online modalities to intervene on mental health concerns for the general population, should also be explored to determine whether caregivers of children with DD will similarly benefit with improvements of parent mental health symptoms.

From an implementation science perspective, attendance can be conceptualized as an implementation outcome related to treatment exposure or dose, while satisfaction aligns with acceptability as defined in Proctor and colleagues' taxonomy of implementation outcomes. The Consolidated Framework for Implementation Research differences in initiation may reflect domains related to the outer setting (e.g., socioeconomic constraints) and characteristics of individuals (e.g., depression), whereas continued attendance may be influenced by inner setting supports and intervention characteristics not directly measured in this study. A key area for consideration for future implementation is how can we mitigate barriers to parents attending the first session.

Future Directions

Future studies should separately examine treatment engagement (engaged verses non-engaged) and attendance dosage. There may be other factors associated with attendance, such as work schedules, childcare supports, child/parent illness, transportation reliability, etc. which may better help us understand the root of disengagement so that we may better target these areas.

To promote engagement, future research should examine ways to increase intervention accessibility. Implementation strategies such as flexible delivery formats (choice of day of week, modality online versus in person), childcare supports, and strategies to promote motivation should be considered. Equity-focused implementation approaches are needed to address disparities in access and engagement among socioeconomically disadvantaged families. This may include offering online modalities, offering transportation assistance, in-home services, and offering childcare during weekly groups. Providing these types of options to caregivers may be especially relevant for families with more significant child needs and for caregivers who experience more significant mental health concerns such as stress and depression or mobility issues.

We should consider how to leverage family and community factors to promote engagement. This may be done through strategies such as motivational interviewing within parent training programs, which Stormshak et al. (2021) found improved parenting skills, strengthened caregiver motivation, and predicted reductions in behavior problems in their study using the Family Check-Up. Motivational interviewing may improve overall BPT satisfaction as it is based upon family strengths, addresses motivations to change, identify specific goals to focus on an individualized approach (Stormshak et al., 2021). We may need to consider different

approaches to higher need families, as they may require more individualized supports than group-based interventions provide.

Future studies should evaluate predictors of engagement and satisfaction from a social determinant of health framework. For instance, socioeconomic factors (e.g., annual household income) may not be truly reflective of treatment engagement and undermine the complex factors that influence participation. Utilizing a social determinant of health framework may better evaluate engagement and satisfaction by examining systemic barriers related to resource availability, access to services, disability, and social inequities for families for children with DD (Tchoua et al., 2024). Using such a framework may illuminate how structural factors intersect with child and parent characteristics which influence treatment engagement, which may lend to the development of more accessible and equitable intervention models (Tchoua et al., 2024).

Future studies should continue to evaluate treatment engagement and satisfaction across diverse study samples and carefully consider barriers. McIntyre et al. (2022) explored telehealth BPT which also utilized the Incredible Years Parent Training Program (IYPT-DD; McIntyre, 2008) with a sample of 42 Spanish-Speaking Latinx families with children with DD. Caregivers noted the lack of childcare, child disruptive behavior during telehealth sessions, and technological challenges as barriers to participate in telehealth BPT sessions (McIntyre et al., 2022). Studies should continue to evaluate BPT modalities that may best support underserved and underrepresented populations and specifically to expand our understanding in supporting underrepresented caregivers of children with DD.

Conclusion

Limitations notwithstanding, this study contributed substantially to our understanding of barriers to family engagement in group-based BPT, consistent with prior literature. In the present

study, baseline mental health and income appeared to matter most at the intervention initiation stage, while attendance dose among engaged caregivers showed minimal association with child behavior and caregiver mental health. More research is needed to better address barriers to access and promote engagement, satisfaction, and optimal outcomes for families caring for children with DD.

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