ORIGINAL PAPER

CrossMark

Therapists' Adaptations to an Intervention to Reduce Challenging Behaviors in Children with Autism Spectrum Disorder in Publicly Funded Mental Health Services

Margaret W. Dyson[1,2] · Colby Chlebowski[1,2] · Lauren Brookman-Frazee[1,2]

Abstract

Publicly funded mental health services play an important role in serving children with autism spectrum disorder (ASD). Previous research indicates a high likelihood of adaptations when therapists deliver evidence based practices to non-ASD populations, though less is known about therapists' use of adaptations for children with ASD receiving mental health services. The current study uses a mixed quantitative and qualitative approach to characterize the types and reasons therapists adapted a clinical intervention [An Individualized Mental Health Intervention for Children with ASD (AIM HI)] for delivery with clinically complex children with ASD served in publicly funded mental health settings and identify therapist characteristics that predict use of adaptations. The most common adaptations were characterized as *augmenting* AIM HI and were done to individualize the intervention to fit with therapeutic style, increase caregiver participation, and address clients' and caregivers' needs and functioning. No therapist characteristics emerged as significant predictors of adaptations. Results suggest that therapists' adaptations were largely consistent with the AIM HI protocol while individualizing the model to address the complex needs of youth with ASD.

Keywords Autism spectrum disorder · Publicly funded mental health · Mental health intervention · Adaptations

Children with Autism Spectrum Disorder (ASD) often have a wide range of intervention needs (e.g., developmental, educational, behavioral, medical) due to their complex clinical presentations (Brookman-Frazee et al. 2009), with multiple community services potentially involved in their care. Publicly funded mental health (MH) services play an important role in serving children with ASD given their high rates of co-occurring non-ASD psychiatric conditions. One study of MH services found that children with ASD or suspected ASD represented, on average, 21% of mental health therapists' caseloads (Brookman-Frazee et al. 2012).

Research suggests that serving this population poses unique challenges for MH therapists due to the complex clinical presentations and slower rates of treatment progress in ASD clients, as well as the difficulty of clients to generalize skills outside the therapeutic setting (Hwang and Hughes 2000). For example, most children with ASD presenting for publicly funded MH services meet criteria for more than one non-ASD co-occurring psychiatric condition (Brookman-Frazee et al. 2017). Therapists report frustration when serving this population as they experience that their existing treatment strategies are ineffective with ASD populations, and they struggle with a lack of tools and training to serve these complex clients (Brookman-Frazee et al. 2012; Hwang and Hughes 2000).

In response to these challenges *An Individualized Mental Health Intervention for Children with ASD* (AIM HI; Brookman-Frazee and Drahota 2010), an intervention and training model, was developed to address the needs for children with ASD and their therapists. It was developed in collaboration with autism experts and community stakeholders and was designed specifically for delivery in publicly funded MH settings. AIM HI is a parent-mediated and child-focused intervention, consisting of a package of evidence-based strategies designed to reduce challenging behaviors in children with autism spectrum disorder ages 5–13 years. AIM

✉ Margaret W. Dyson
     mdyson@ucsd.edu

1   Department of Psychiatry, University of California,
     San Diego, CA, USA

2   Child and Adolescent Services Research Center (CASRC),
     3020 Children's Way, MC 5033, San Diego, CA 92123, USA

HI consists of a series of intervention protocol steps and within session elements, which are intervention strategies that therapists are trained to use in all AIM HI sessions to structure sessions and actively teach parent and child skills. Results from a pilot study indicated that MH therapists participated in the initial and ongoing AIM HI training, delivered the intervention with fidelity, and perceived AIM HI to be useful with their ASD clients (Brookman-Frazee et al. 2012). It also provided preliminary evidence of effectiveness in reducing challenging behaviors in children. Building on the successful pilot study, a large-scale randomized community effectiveness trial was recently completed. Results indicate that children whose therapists were trained in AIM HI showed greater reductions in challenging behaviors over 18 months compared to children whose therapists delivered usual care. Furthermore, observed therapist fidelity moderated treatment effects (Brookman-Frazee et al. 2018). Given the important role of therapist delivery of intervention strategies, further characterizing therapist delivery is necessary.

Within the broader research on child mental health services with non-ASD populations, the literature indicates a high likelihood of adaptations when therapists deliver evidence based practices (e.g., Aarons et al. 2012; Cooper et al. 2016; Lau et al. 2017; Stirman et al. 2013). Recent studies characterizing the most common types of adaptations suggest that some are made with the intent to enhance the components of the evidence-based practice (EBP), whereas others reflect reduction or reordering of components of the EBP (Lau et al. 2017; Stirman et al. 2013, 2015). For instance, in a sample of therapists delivering CBT, the most commonly reported adaptations included tailoring the intervention for clients' needs, integrating other intervention approaches, loosening the structure of the treatment protocol, and drift from the protocol (Stirman et al. 2013). Similarly, in a recent study by Lau et al. (2017) examining therapist-reported EBP adaptations in children's MH settings, two types of adaptations, (1) augmenting (e.g., lengthening and pacing, integrating supplemental content or strategies from other EBPs, modifying how components were presented), and (2) reducing/reordering (e.g., reducing the pacing, omitting components, reordering components), emerged from a multilevel confirmatory factor analysis, with augmenting adaptations being the most common type of adaptation made by therapists.

There is also emerging research exploring the rationale provided by therapists for their EBP adaptations. Therapists have described making modifications to EBPs in order to improve "fit" of the EBP with the client's needs or to better match their own therapeutic approach (Cooper et al. 2016; Stirman et al. 2013). Additionally, therapists have described reducing or omitting components of an intervention due to logistical issues (e.g., insufficient time in session), or client attributes (e.g., culture) (Cooper et al. 2016).

Finally, the tension between fidelity and the adaptation of an EBP model continues to be a consistent challenge with regard to the implementation of EBPs (Aarons, Miller et al. 2012). As such, therapist characteristics have been explored as factors associated with application of certain types of adaptations. For example, Stirman and colleagues (2015) examined therapist-level factors associated with reported fidelity-consistent (i.e. adaptations do not alter the core components of the intervention) and fidelity-inconsistent (i.e. adaptations reduce the delivery of the core components of the intervention) adaptations for therapists using CBT with children and adults. While the authors reported marginally significant findings suggesting that therapists who at baseline endorsed greater openness to trying new interventions were more likely to make modifications that preserved core elements of cognitive behavioral therapy (CBT), they also found that therapists who reported greater willingness to adopt EBPs if they found them appealing were more likely to make fidelity-inconsistent modifications. Overall, successful completion of training in a CBT intervention was associated with subsequent fidelity-consistent modifications. Building on the work of Stirman and colleagues, Lau et al. (2017) also examined potential therapists' attributes associated with types of adaptations. Their data indicate that therapists with fewer years of experience and Hispanic/Latino therapists endorsed more augmenting adaptations; however, no therapist characteristics were associated with reducing/reordering adaptations. Findings also suggest that therapists made more augmenting or reducing/reordering adaptations if EBPs being implemented were perceived to differ from their own therapeutic approach. A negative perspective of a particular EBP predicted reducing/reordering adaptations, but not augmenting adaptations.

Although these studies provide initial information and insight about therapist EBP implementation in publicly funded MH services more broadly, scant research exists on therapists' use of adaptations in EBPs for the subpopulation of children with ASD receiving MH services. This is a relevant area for study as the number of children with ASD served in MH settings continues to rise. The complex clinical needs of these children may be related to therapists' adaptations of EBPs and further study is needed to understand how and why therapists may be adapting EBPs for children with ASD presenting for MH treatment.

The current study utilizes a mixed-methods approach to (1) characterize the most common types of adaptations used by therapists implementing an evidence-based protocol for children with ASD in publicly funded outpatient and school-based MH services; (2) characterize therapists' reasons for making adaptations; (3) examine associations between adaptation type and reasons for adaptations; and (4) identify therapist factors associated with the most common adaptations. Implications of findings on implementation of

evidence-based interventions for ASD populations will be discussed.

Method

Study Context

Data for the current study were drawn from the third training cohort (2014–2015) of a recently completed large-scale, randomized, community effectiveness trial of *An Individualized Mental Health Intervention for Children with ASD* (AIM HI; Brookman-Frazee and Drahota 2010), which was conducted from 2012 to 2017. In the intervention condition of the trial, therapists received training in AIM HI and ongoing training consultation for six months while they delivered AIM HI to a participant child/family with performance feedback from an expert trainer.

AIM HI Clinical Intervention and Training

The AIM HI clinical intervention involves a series of protocol steps designed to teach caregivers of children with ASD to manage challenging behaviors and teach children to utilize positive alternative skills. Therapists are trained to identify the primary functions of challenging behaviors, use and teach antecedent and consequence-based strategies to develop caregiver skills, and utilize active teaching strategies (e.g., psychoeducation, modeling, practice with feedback, between-session practice) to teach child and caregiver skills (see Brookman-Frazee et al. 2012 for a detailed discussion of the intervention). Therapists are taught to collaborate with caregivers throughout treatment and individualize the delivery of AIM HI to the needs of the client and family.

The AIM HI training process used in the current study was comprised of an initial training workshop consisting of didactic instruction, video exemplars, case examples, and participant exercises. Following the workshop, therapists delivered AIM HI to a client and participated in six months of consultation meetings with expert trainers. The consultation series included didactic instruction and individualized feedback on AIM HI implementation, including performance feedback based on trainer review of recordings of therapy sessions. Therapists utilized self-study materials, including an intervention manual and a resource website with intervention materials and video exemplars.

Participants

Participants in the current study included a subgroup of 55 therapists from the larger effectiveness trial drawn from 13 school-based and clinic-based programs in a geographically and racially/ethnically diverse Southern California county

and their participating clients with ASD and their families. These therapist participants were eligible for the current study as they participated in the third (of four) training cohorts of the community effectiveness trial, which is when the pre- and post-training data were collected, including questions and a semi-structured interview about use of adaptations to the AIM HI intervention. Of note, seven therapists participated in cohort three of the AIM HI intervention with two separate child participants resulting in available data from 55 therapists and 62 children/families. There were three therapists that discontinued AIM HI training shortly after completing the initial training workshop and did not complete the consultation series. Due to the limited opportunity to deliver the AIM HI intervention to their clients, these individuals did not complete the AES or interview as they would have been unable to comment on adaptations made to the AIM HI intervention. These therapists did not significantly differ from the participating therapists on the demographic variables described below.

Therapist Participants (n = 55)

Therapists were 87.3% female and an average of 33.05 years old ($SD = 7.51$; range = 23–57). In terms of self-identified race/ethnicity, 47.3% were Non-Hispanic White, 27.3% were Hispanic/Latino, 23.6% were Asian, and 1.8% were African American. Primary therapist disciplines were Marriage and Family Therapy (58.2%), Social Work (30.9%), Clinical Psychology (9.1%), and Psychiatry (1.8%). Therapists' self-reported primary theoretical orientations included: Cognitive-Behavioral (52.7%), Family Systems (16.4%), Eclectic (14.5%), Humanistic (10.9%), and Other (5.5%). Therapists' years of experience ranged from 0 to 21 years ($M = 4.76$ years; $SD = 4.41$; Range = 0–21). Approximately two-thirds of the therapists were staff (67.3%) and the remaining were trainees (32.7%); 25.5% of therapists were licensed.

Child Participants (*n* = 62)

Therapists were enrolled in the effectiveness trial with a participant child/family. Eligibility criteria for children were as follows: (a) were ages 5–13 years during the recruitment period, (b) spoke English or Spanish as their primary language, (c) presented with at least one challenging behavior, and (d) had an existing ASD diagnosis on record and exhibited clinically significant ASD symptoms on a standardized ASD diagnostic measure (refer to Brookman-Frazee et al. (2017) for a description of the child sample for the effectiveness trial). Consistent with the trial sample, the participant children included in the current analyses presented with moderate autism severity ($n = 57$; ADOS-2 severity score, $M = 6.98$, $SD = 2.07$ and SRS-2 standard score $M = 77.52$, $SD = 10.64$) and average

cognitive functioning ($n = 52$; WASI-II Full-Scale IQ standard score $M = 90.67$, $SD = 14.99$).

Procedure

Data Collection Process

Therapists completed web-based surveys at baseline (pre-training workshop) and six months post training/intervention delivery. After six months of intervention delivery with consultation and performance feedback from their AIM HI trainer, therapists participated in brief, semi-structured interviews with research staff who had not been involved in the intervention training process and were informed that their individual responses would not be shared with their AIM HI trainer or the clinical training team. Interviews consisted of initial open-ended questions and interviewers used follow-up probes to elaborate on therapists' responses.

Measures

Therapist Characteristics

Prior to participating in AIM HI training, therapists completed a web-based survey asking about demographic variables (age, gender, race/ethnicity), professional characteristics (mental health discipline, theoretical orientation, years of clinical experience, licensure status) and training experience (prior coursework, training, or implementation experience with evidence based interventions).

Evidence-Based Practice Attitude Scale (EBPAS)

The EBPAS (Aarons 2004) is a 15-item self-report measure used to assess therapists' attitudes towards EBPs. The EBPAS yields a total scale score and four subscales: Appeal, Requirements, Openness, and Divergence. The measures examines therapists' willingness to adopt evidence-based interventions given the appeal of EBPs (Appeal), existing requirements for EBPs (Requirements), therapists' openness to innovation and use of EBPs (Openness), and therapists' perceptions regarding the importance of using evidence-based interventions in clinical practice (Divergence). Therapists rated each item on a 5-point Likert scale assessing level of agreement (0 = "not at all," 4 = "very great extent"). The EBPAS was completed at baseline data collection. Internal consistency was acceptable for the Appeal ($\alpha = .82$), Requirements ($\alpha = .97$), Openness ($\alpha = .79$) and Divergence ($\alpha = .76$) scales.

Adaptations to Evidence-Based Practices Scales (AES)

Therapists were asked to complete the AES questionnaire, which asks about the adaptations and rationales for adaptations they made when implementing the AIM HI intervention. Therapists were provided with statements outlining various ways of modifying, tailoring, or adapting the AIM HI intervention and were asked to respond to the statements indicating their own use of the adaptation using a 6-point Likert scale (1 = "not at all," 6 = "to a great extent"). Therapists were also provided with a write in response option to allow for reporting of additional adaptations not addressed by the items on the questionnaire. Similar to the adaptations statements, therapists were provided with a series of statements and asked to rate the extent to which it served as a reason for adapting the AIM HI Intervention on a 6-point Likert scale (i.e. 1 = "not at all," to 6 = "to a great extent"). Therapists were also given the option to write in a response for any rationales not included in the questionnaire. The AES was completed at the six month data collection.

Semi-structured Interview

Semi-structured interviews were completed with therapists post training at the six month data collection; the average interview length was 22:30 minutes (range 03:30–0:50:57 minutes). The relevant section of the semi-structured interview examined in the current study addressed therapists' adaptations to the AIM HI intervention (e.g., "anything you may have done to adapt AIM HI for your client or student"). Therapists were asked about adaptations as well as the reason or influence for the adaptation in eight key areas: (1) Modifications of materials, (2) Changes to language/terminology, (3) Omission of intervention components, (4) Integration of other treatments, (5) Adjustment of pacing/length of the intervention, (6) Modifications to the intervention to increase caregiver participation, (7) Modifications to the intervention to adapt to caregiver functioning, (8) Involvement of others beyond the child and caregiver in treatment. Therapists were also asked to identify any additional adaptations/modifications they made to the intervention not directly asked about using the specific probes.

Data Analytic Plan

Quantitative Data Analysis

Descriptive statistics (frequencies) were used to characterize the types of adaptations and rationales therapists reported on the AES. To obtain the frequency of any adaptation or rationale made, the survey items were dummy coded. Ratings of 2 and above (on a 1–6 scale) were coded as 1 (adaptation/rationale present) and ratings of 1 were coded as 0

(adaptation/rationale not present). Regression analyses were conducted to examine associations between commonly reported adaptations and provided rationales. Lastly, potential therapist background predictors [e.g., ethnicity, number of training consultations completed, clinical experience, and therapists' attitudes towards EBPs (EBPAS Appeal, Openness, Requirements, and Divergence scales)] of adaptations were examined.

Qualitative Data Analysis

We applied a Coding Consensus, Co-occurrence, and Comparison (Willms et al. 1990) approach to analysis of qualitative interview data. A subset of transcripts were coded by two investigators using an initial coding scheme based on *a priori* domains. Four research assistant coders trained in qualitative coding then applied these domains to the documents, identifying any domains not captured. Next, independent coding occurred using the identified coding scheme, followed by consensus discussions about the clarity, comprehensiveness, and distinctiveness of the codes. Novel themes were discussed to arrive at a consensus concerning their inclusion and definition in the coding scheme. Another set of transcripts were independently coded by the four research assistant coders using the revised coding scheme with both *a priori* and emergent codes. Independent coding of documents was then compared, with disagreements resolved through discussion with the principal investigator to achieve consensus and refine the codes. Following this, four team members separately applied the final coding scheme to a third set of transcripts to assess inter-rater agreement (Boyatzis 2009). Lastly, once reliability was established, coding was monitored to prevent drift. Transcripts were entered and coded via NVivo qualitative data software (Version 10; 2012). The number of subjects needed is not informed by standard power calculations; however, studies relying upon the coding, consensus, co-occurrence, and comparison methodology have found that information becomes repetitive and little new information is gleaned after analyses of data from 20 to 30 participants (Miles and Huberman 1994; Strauss and Corbin 1998). By these standards, the present study has adequate sample size to achieve saturation.

Integration of Quantitative and Qualitative Data

Qualitative (QUAL) and quantitative (QUANT) were integrated to assess consistencies and discrepancies between these data to determine if issues and constructs most relevant to adaptations and rationales were appropriately captured. QUANT and QUAL data were integrated through triangulation. Results of each data were placed side-by-side to examine: (1) convergence (do results provide the same answer to the same question); (2) expansion (are unanticipated findings produced by one data set explained by another); and (3) complementarity (does embedding QUAL data within the QUANT data help contextualize overall results) (Aarons et al. 2012).

Results

Responses from the 55 therapists who completed the AES indicated that 95% of the therapists made adaptations to the AIM HI intervention. In what follows, the most common adaptations and provided reasons for adaptations based on the AES survey and qualitative interviews are described.

Objective 1: Characterize Occurrence of Therapist-Reported Adaptations

Modified Language

On the AES, 76% of therapists reported that they modified how they discussed or presented the components of the AIM HI intervention with their clients and families. Interview responses revealed that therapists often modified the language of AIM HI when explaining behavioral concepts, such as antecedents and consequences, when using the behavior tracking forms. For example, therapists described using simpler terminology such as, "what happened before" as a substitute for the term *antecedent* when completing the behavior tracking form with clients.

Slowed the Pace

Approximately three-quarters (74%) of the therapists reported that they slowed the pace of the AIM HI intervention with their clients and families in order to spend more time on certain protocol steps. In addition to being reported very frequently on the AES, this adaptation emerged as the most salient theme during the qualitative interviews. In particular, a number of therapists described extending the pacing of the *Behavior Tracking* protocol step of the treatment planning phase and the *Teaching Antecedent and Reinforcement/Consequence-Based Parent Skills* protocol step of the active teaching phase (See Table 1 for illustrative quotes).

Integrated Other Treatments

On the AES, 73% of therapists indicated that they integrated components of other treatments in their delivery of the AIM HI intervention with their clients and families. More specifically, during the interviews, therapists described integrating components from Managing and Adapting Practice (MAP), Triple P (parenting program),

Table 1 Types of adaptations

Type of adaptation	Illustrative quote
Modified Language	"I don't want to say I dumbed it down, but I definitely put it in layman's terms to where my family can get a visual, and understand it. I also explained it like an ice cream cone, where you have an ice cream cone as the foundation and then you put the ice cream on it, and then the sprinkles order. Kind of like the rewards do. We used a lot of visuals and other ways of trying to explain it."
Slowed the Pace	*Extended time on parent skills* "Yes, I did. I spent a lot of time on the parenting skills because I felt like that's where we had to start, and where we had to be at a good place before we could move on and be effective in teaching the child skills. If anything I just prolonged it a couple weeks, but that's about it."
	Extended time on behavior tracking "Behavior tracking took a while as did the antecedent consequence reinforcement stuff with the parent…[I] really wanted to make sure that she was able to—because I know that she could understand everything that we're talking about in session, but really making sure that she was able to apply it."
Integrated Other Treatments	"I pulled things especially from MAP. I pulled some practice skills."
Involved Others	*Involved family*: "I involved the brother to get the client more engaged. That tends to be helpful, but also a lot of my clients' aggressive behaviors are towards the brother. So, anything that I'm going to be teaching the client, the brother's probably going to benefit from learning as well."
	Involved teachers "Yes, both teachers, I was able to talk with them about things that they could do in the classroom that would be useful, and they did use those things and they were beneficial. So for instance, one of the things I started doing because she hated the word work - I thought, well, homework, the word work is in homework - so let's call them activity sheets. And so I called them activity sheets and she definitely got more on board with it. And so I had the teachers also call them activity sheets so that that would work until she was able to tolerate that word. Then I started calling them homework and it didn't faze her at all because she wasn't bothered by the word work anymore."
Out of Session Components	"If they were having trouble with behavior tracking, or they didn't really understand how to figure out the function of the behavior, then I would do it in session with them, give it to them to do for the following week, and then bring it back, and then go over again with them."

CBT, and solution-focused therapy to enhance their delivery of the AIM HI intervention (See Table 1).

Involved Others

On the survey, 58% of therapists adapted the AIM HI intervention to involve other people beyond the child's primary caregivers in the treatment process. Qualitative interviews expanded on this adaptation to indicate that therapists frequently involved others from both the home and educational settings. As illustrated in Table 1, a number of therapists described including siblings, teachers and other key school staff (e.g., support aide, principal) to help with client engagement, identifying the challenging behaviors and their functions, and the teaching and generalizing specific child skills.

Modified Materials

According to the AES, less than half (40%) of the therapists endorsed modifying the AIM HI materials (e.g., treatment forms). During the interviews, only a few therapists described making specific adaptions to the AIM HI materials with the most common modification being made to the Session Summary/Between Session Practice form (i.e. homework form) (See Table 1).

Omitted Components

Less than a third (32%) of therapists removed components of the AIM HI intervention. Qualitative interviews revealed that the *Session Summary/Between Session Practice* form (i.e. protocol form used to review content covered in session and to assign and review homework with child and family) was the most common component omitted from the treatment process.

Out of Session Components (Qualitative Interview Only)

Although not asked about specifically on the AES survey, a theme related to the need to complete out of session components (e.g., assigned between session practice) in session emerged in the qualitative interviews. More specifically, therapists described completing *Behavior Tracking* (i.e. functional analysis) in session because the caregiver was unable to complete the form prior to the session as previously assigned (See Table 1).

Objective 2: Characterize Therapist-Reported Reasons for Adaptations

Child Presentation

A majority of the therapists (82%) reported making adaptations to address the child's clinical presentation, needs,

and functioning (e.g., developmental level, severity of ASD symptoms, comorbidity) on the survey. Likewise, during the interviews, a number of therapists shared that they made adaptations (e.g., altered language) to match their clients' needs and level of functioning (e.g., low motivation, communication delays, slow verbal processing).

Caregiver Participation

On the AES, 80% of therapists endorsed making adaptations to the AIM HI protocol with the goal of increasing caregiver involvement and participation in the therapeutic process with their clients. This rationale emerged as the most salient rationale during the qualitative interviews (See quote in Table 2).

Caregiver Presentation

Similar to the child's clinical presentation, on the survey 72% of therapists noted that adaptations were made to accommodate a range of caregiver characteristics of their clients. Therapists expanded on this rationale during the interview to illustrate that therapists made frequent adaptations (e.g., modified terminology) due to caregiver factors (e.g., education level) (See example quote in Table 2).

Fit with Therapeutic Approach

On the survey, 70% of therapists indicated that adaptations were made to the AIM HI intervention to match their own therapeutic style or treatment philosophy. A few comments were also made by therapists describing how they adapted the intervention to match their treatment approach (e.g.,

integrated principles from their theoretical orientation) (See quote from Table 2).

Generalize Skills (Qualitative Interview Only)

Similar to enhancing caregiver participation, during the interviews, therapists reported making adaptations with the goal of generalizing the child's skills to other people and settings. For instance, several therapists described working closely with teachers and school staff to generalize skills learned in therapy in the classroom setting (See example quote in Table 2).

Objective 3: Associations Between Adaptation Type and Reasons for Adaptations

To further examine the associations among the emergent adaptation and rationale themes, a series of regression and matrix queries (in NVivo) were conducted. Results for the four most common emergent adaptations are discussed below.

Modified Language

Based on regression analyses, the modified language adaptation was significantly associated with the rationales of caregiver participation ($B = .20$, $SE = .09$, $\beta = .28$, $p < .05$), child presentation ($B = .24$, $SE = .09$, $\beta = .33$ $p < .001$), caregiver presentation ($B = .27$, $SE = .08$, $\beta = .40$, $p < .001$), and fit with therapeutic approach ($B = .30$, $SE = .11$, $\beta = .33$, $p < .01$). Based on the qualitative data, multiple therapists described having to use simpler and more concrete language to account for the child and/or caregiver's presentation. For example, a number of therapists indicated that they often modified the

Table 2 Types of rationales

Type of rationale	Illustrative quote
Caregiver Participation	"Yeah, I feel like there was a big focus on that at the beginning, to get that buy-in. We spent maybe two sessions on the behavior plan to make sure Mom had buy-in in that. And then after that it's been—obviously we need a lot more time."
Child Presentation	"My client was much lower functioning, so I had to move at a much slower pace even spending like six sessions working on the same skill to really get that practice, and he really needed that. But I think that really helped."
Caregiver Presentation	"I didn't have a formal diagnosis for mom, but I was suspecting that mom was somewhere on the autism spectrum as well as her son which made things more difficult… I think I made my own attempts just to try and be more clear: use more clear language, more repetition, practicing things over and over. But I think that was between my AIM HI trainer and myself coming up with ways to modify it, just language, and more practice, and more concrete examples of things to try and help with that."
Fit with Therapeutic Approach	"I definitely used a lot of interventions from my own theoretical orientation. Using a lot of solution-focused questioning and strength-based interventions as well. And I understand that there's a lot of token economy use and reinforcement in the interventions already, but I would also just continue that as well."
Generalize Skills	"The client is generalizing that to other places and that's one of the other places that we were having her generalize was in school because a lot of her behaviors were affecting her schooling and her relationships and those kinds of things."

AIM HI terminology to make concepts easier to understand for a range of caregiver characteristics (e.g., monolingual Spanish-speaking caregivers, those with lower education or literacy levels, and those with their own mental health/developmental challenges) and child characteristics (e.g., low motivation, communication delays, slow verbal processing). However, modifying language in order to increase caregiver participation or to fit with therapeutic approach did not emerge as a theme in these data.

Slowed the Pace

The adaptation of extending pacing of the intervention was significantly associated with the rationales of caregiver participation ($B = .48$, $SE = .11$, $\beta = .49$, $p < .001$), child presentation ($B = .37$, $SE = .12$, $\beta = .38$, $p < .01$), caregiver presentation ($B = .41$, $SE = .10$, $\beta = .46$, $p < .001$), and fit with therapeutic approach ($B = .46$, $SE = .15$, $\beta = .32$, $p < .01$). Several therapists described slowing down the pace of the delivery of the AIM HI protocol in order to get more "buy in" from the parent (e.g., "We spent maybe two sessions on the behavior plan to make sure Mom had buy-in in that"). Similar to the modified language adaptation, the matrix queries revealed that therapists also felt the need to spend more time on protocol steps due to child and/or caregiver presentation. For example, one therapist described having to review concepts multiple times to help the parent grasp and retain skills. An association with fit with therapeutic approach did not emerge in the matrix queries.

Integrated Other Treatments

The integration of other treatment approaches was significantly predicted by the rationales of caregiver participation ($B = .27$, $SE = .10$, $\beta = .33$, $p < .01$), child presentation ($B = .31$, $SE = .10$, $\beta = .38$, $p < .01$), caregiver presentation ($B = .28$, $SE = .09$, $\beta = .37$, $p < .01$), and fit with therapeutic approach ($B = .33$, $SE = .13$, $\beta = .32$, $p < .01$). Matrix queries revealed that multiple therapists integrated interventions from other treatments (e.g., solution-focused, play therapy, MAP) into their delivery of AIM HI with the underlying purpose of increasing fit with their own therapeutic approach. However, the qualitative data did not expand upon the significant associations with this adaptation and the rationales of caregiver participation, caregiver presentation, and child presentation.

Involved Others

Neither the regression analyses nor the matrix queries revealed any significant associations with the adaptation of involved others and the most commonly provided rationales.

Objective 4. Identify Therapist Predictors of Adaptations

Simultaneous multiple regressions were conducted with the therapist background characteristics predicting the four most common adaptations (i.e. modified language, extended pacing, integrated treatments, involved others) from the survey to examine whether these characteristics were associated with reports of adaptations. Therapist characteristics included ethnicity, number of AIM HI training consultations completed, previous clinical experience, and therapists' attitudes towards EBPs (EBPAS Appeal, Openness, Requirements, and Divergence scales). None of the therapist characteristics examined were significantly associated with any of the primary adaptations.

Discussion

A growing body of literature suggests that it is common for therapists working with non-ASD populations to adapt EBPs when delivering in publicly funded MH services (Lau et al. 2017; Stirman et al. 2015; Taylor et al. 2015). However, there is limited research elucidating those adaptations that are made by therapists delivering EBPs with ASD youth served in these settings. As such, the present study employed a mixed-methods approach to characterize adaptations made by therapists to AIM HI, a package of evidence-based strategies designed specifically for children with autism spectrum disorder served in publicly funded MH settings.

Mixed-method analyses revealed four common adaptations made by therapists when delivering AIM HI: modified language, slowed the pace, integrated other treatments, and involved others. These adaptations align with those identified as frequently occurring in children's MH services when therapists deliver EBPs to children without ASD (e.g., Lau et al. 2017; Stirman et al. 2013). Moreover, these types of adaptations represent consistency with the AIM HI protocol and the performance feedback provided by AIM HI trainers to therapists on how to individualize the AIM HI intervention to their clients with ASD. For example, if a therapist expressed concern about a caregiver not grasping a skill such as behavior tracking, the AIM HI trainer would encourage the therapist to extend the amount of time they spent on teaching behavior tracking to ensure that caregivers understood the underlying function of the child's challenging behaviors prior to moving on to the next step in the treatment planning phase.

Although some therapists indicated making adaptations (i.e. modified materials, omitted components) consistent with the reduction of EBP delivery, these types of adaptations were infrequent and far less common than augmenting adaptations, which is similar to findings from previous

research (e.g., Lau et al. 2017). The limited use of reducing adaptations may be indicative of high therapist engagement with the core components of the AIM HI intervention and may reflect the fit of the intervention to the needs of the therapists and clients it was designed to serve.

Findings related to the links between adaptation types and reasons for these adaptations suggest that therapists made augmenting adaptations with the primary intent or rationale to enhance the intervention to fit with their therapeutic approach and to address the client and/or caregiver's needs, functioning, and engagement. These same reasons have also emerged in prior studies that emphasize the importance of adapting aspects of an EBP to address both client (i.e. the needs of a specific demographic or diagnostic group) and therapist (e.g., increase their own level of comfort or match their own personal approach to therapy) level factors (e.g., Stirman et al. 2013).

These findings about the use of protocol consistent adaptations has informed revisions to improve the AIM HI training and intervention materials to reflect the needs of therapists actively using AIM HI materials in clinical settings. Data collected at the end of each training cohort has allowed for a bidirectional feedback loop in which materials continue to be refined and then provided for therapists to use with new training cohorts. In response to the identified adaptations, a revised AIM HI Therapist Manual (Brookman-Frazee et al. 2016) has been developed and the language on the AIM HI protocol forms and training materials has continued to be simplified to remove technical terms (such as "antecedent"). In order to address the need to individualize intervention delivery by slowing the pace and integrating other treatments, refinements were made to the protocol forms to more explicitly and simply guide the individualized implementation of AIM HI. For example, we now explicitly ask therapists to document the individuals who will be involved in a particular session (including identifying individuals beyond the child's primary caregivers, if appropriate), outline the specifics about how in-session practice/role-plays will be set up for both children and caregivers, and consider any additional intervention strategies that may need to be incorporated into session content. Additionally, the pacing of training consultations has been slowed to allow for repeated presentations of the key AIM HI components in consultations, both to allow for repetition of material for therapists learning the intervention and to better match the pace that AIM HI is being delivered to clients. The adaptations identified by therapists were related to the process of delivering AIM HI, rather than reflecting proposed changes to the active ingredients of the intervention. The revised manual and training materials are currently being utilized in a large-scale, multi-site study (1 R01 MH111950 01,1 R01 MH111981 01) examining the implementation of AIM HI, with a focus on factors impacting therapist delivery of AIM HI.

Previous research highlights the unique challenges and lack of ASD-specific intervention protocols available to MH therapists when treating youth with ASD (Brookman-Frazee et al. 2012; Hwang and Hughes 2000). The current line of research aims to build the capacity of MH providers to effectively serve children with ASD. This mixed-methods study suggests that the types of adaptations and rationales made by therapists trained to deliver AIM HI appear to appropriately address the complex needs of youth with ASD. For instance, given that youth with ASD often experience difficulties with receptive and expressive language and extending their skills in different settings or with different people, the adaptations of modifying the language (e.g., using simpler terms), slowing the pace of intervention to allow more time to practice skills, and involving others (e.g., other family members, teachers) to facilitate the generalization of learned skills are not only recommended but consistent with those core components included in adapted EBPs for youth with ASD (e.g., White et al. 2010; Wood et al. 2009). Furthermore, data suggest that these adaptations appear to improve therapists' acceptability and satisfaction with AIM HI, which in turn may have led therapists to perceive better outcomes for their clients. Nonetheless, additional research is needed to further determine if these adaptations are associated with improvement in client symptoms and functioning.

It is important to acknowledge some limitations of the present study. First, all therapist participants in the study were from agencies in Southern California. Therefore, additional responses from therapists from other regions would enrich our findings and make them more generalizable. Second, we relied soley on therapist-report of adaptations rather than observational ratings. It is possible that therapists and observers may have some differences in what is considered an adaptation or other adaptations may have occurred during intervention delivery that were not reported by therapists. Additionally, there is the possibility that therapists may have been reluctant to report adaptations made to the intervention protocol due to social desirability bias. Therefore, future studies should also incorporate observational ratings of therapists' adaptations based on video-recorded sessions to provide a more comprehensive and precise assessment of potential adaptations.

Summary

This mixed-methods study examined the types and reasons therapists adapted the AIM HI clinical intervention for children with ASD served in publicly funded outpatient and school-based MH services. Data suggest that that the majority of therapists made augmenting adaptations to the

AIM HI protocol, and these adaptations were made with the intent to enhance the intervention to fit with therapeutic approach and to address clients' and caregivers' needs, functioning, and comprehension. Furthermore, findings suggest that therapists are able to implement fidelity-consistent adaptations to the AIM HI protocol and use adaptations to meet the unique needs of youth with ASD.

Compliance with Ethical Standards

Conflict of interest All authors report no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

References

Aarons, G. A. (2004). Mental health provider attitudes toward adoption of evidence-based practice: The evidence-based practice attitude scale (EBPAS). *Mental Health Services Research, 6*, 61–74. https://doi.org/10.1023/B:MHSR.0000024351.12294.65.

Aarons, G. A., Fettes, D. L., Sommerfeld, D. H., & Palinkas, L. (2012). Mixed methods for implementation research: Application to evidence-based practice implementation and staff turnover in community based organizations providing child welfare services. *Child Maltreatment, 17*, 67–79. https://doi.org/10.1177/1077559511426908.

Aarons, G. A., Miller, E. A., Green, A. E., Perrott, J. A., & Bradway, R. (2012). Adaptation happens: A qualitative case study of implementation of the incredible years evidence-based parent training programme in a residential substance abuse treatment programme. *Journal of Children's Services. 7*, 233–245. https://doi.org/10.1108/17466661211286463

Boyatzis, R. E. (2009). *Transforming qualitative information: Thematic analysis and code development*. Thousand Oaks: SAGE.

Brookman-Frazee, L., Baker-Ericzén, M., Stahmer, A., Mandell, D., Haine, R. A., & Hough, E. L. (2009). Involvement of youths with autism spectrum disorders or intellectual disabilities in multiple public service systems. *Journal of Mental Health Research in Intellectual Disabilities, 2*, 201–219. https://doi.org/10.1080/19315860902741542.

Brookman-Frazee, L., & Drahota, A. (2010). *An individualized mental health intervention for children with autism spectrum disorders (AIM HI): A model to address challenging behaviors in children with ASD—A therapist manual*. San Diego: University of California, San Diego.

Brookman-Frazee, L., Drahota, A., & Chlebowski, C. (2016). *An individualized mental health intervention for children with autism spectrum disorders (AIM HI): A model to address challenging behaviors in children with ASD: Therapist manual- Version 2*. San Diego: University of California, San Diego.

Brookman-Frazee, L., Drahota, A., Stadnick, N., & Palinkas, L. (2012). Therapist perspectives on community mental health services for children with autism spectrum disorders. *Administration and Policy in Mental Health and Mental Health Services Research, 39*, 365–373. https://doi.org/10.1007/s10488-011-0355-y.

Brookman-Frazee, L., Roesch, S., Chlebowski, C., Baker-Ericzén, M., & Ganger, W. (2018). *Effectiveness of training therapists in An Individualized Mental Health Intervention for ASD: A cluster randomized trial in publicly-funded mental health services*. Manuscript submitted for publication.

Brookman-Frazee, L., Stadnick, N., Chlebowski, C., Baker-Ericzén, M., & Ganger, W. (2017). Characterizing psychiatric comorbidity in children with autism spectrum disorder receiving publicly funded mental health services. *Autism, 2017*, 1–15. https://doi.org/10.1177/1362361317712650.

Brookman-Frazee, L. I., Drahota, A., & Stadnick, N. (2012). Training community mental health therapists to deliver a package of evidence-based practice strategies for school-age children with autism spectrum disorders: A pilot study. *Journal of Autism and Developmental Disorders. 42*, 1651–1661. https://doi.org/10.1007/s10803-011-1406-7.

Cooper, B. R., Shrestha, G., Hyman, L., & Hill, L. (2016). Adaptations in a community-based family intervention: Replication of two coding schemes. *The Journal of Primary Prevention, 37*, 33–52. https://doi.org/10.1007/s10935-015-0413-4.

Hwang, B., & Hughes, C. (2000). The effects of social interactive training on early social communication skills of children with autism. *Journal of Autism and Developmental Disorders, 30*, 331–343. https://doi.org/10.1023/A:1005579317085.

Lau, A., Barnett, M., Stadnick, N., Saifan, D., Regan, J., Wiltsey Stirman, S., & Brookman-Frazee, L. (2017). Therapist report of adaptations to delivery of evidence-based practices within a system-driven reform of publicly funded children's mental health services. *Journal of Consulting and Clinical Psychology, 85*, 664–675. https://doi.org/10.1037/ccp0000215

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd edn.). Thousand Oaks: SAGE.

NVivo qualitative data analysis software (Version 10) [Computer software]. (2012). Retrieved from http://www.qsrinternational.com/.

Stirman, S. W., Calloway, A., Toder, K., Miller, C. J., DeVito, A. K., Meisel, S. N., & Crits-Christoph, P. (2013). Community mental health provider modifications to cognitive therapy: Implications for sustainability. *Psychiatric Services, 64*, 1056–1059. https://doi.org/10.1176/appi.ps.201200456.

Stirman, S. W., Gutner, C. A., Crits-Christoph, P., Edmunds, J., Evans, A. C., & Beidas, R. S. (2015). Relationships between clinician-level attributes and fidelity-consistent and fidelity-inconsistent modifications to an evidence-based psychotherapy. *Implementation Science, 10*, 115. https://doi.org/10.1186/s13012-015-0308-z.

Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd edn.). Thousand Oaks: SAGE.

Taylor, W. D., Asgary-Eden, V., Lee, C. M., & LaRoche, K. J. (2015). Service providers' adherence to an evidence-based parenting program: What are they missing and why? *Journal of Child and Family Studies, 24*, 50–56. https://doi.org/10.1007/s10826-013-9812-4.

White, S. W., Albano, A. M., Johnson, C. R., Kasari, C., Ollendick, T., Klin, A., & Scahill, L. (2010). Development of a cognitive-behavioral intervention program to treat anxiety and social deficits in teens with high-functioning autism. *Clinical Child and Family Psychology Review, 13*, 77–90. https://doi.org/10.1007/s10567-009-0062-3.

Willms, D. G., Best, J. A., Taylor, D. W., Gilbert, J. R., Wilson, D. M. C., Lindsay, E. A., & Singer, J. (1990). A systematic approach for using qualitative methods in primary prevention research. *Medical Anthropology Quarterly, 4*, 391–409. https://doi.org/10.1525/maq.1990.4.4.02a00020.

Wood, J. J., Drahota, A., Sze, K., Van Dyke, M., Decker, K., Fujii, C., & Spiker, M. (2009). Brief report: Effects of cognitive behavioral therapy on parent-reported autism symptoms in school-age children with high-functioning autism. *Journal of Autism and Developmental Disorders, 39*, 1608–1612. https://doi.org/10.1007/s10803-009-0791-7.