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Transporting attachment and biobehavioral catch-up to Norwegian child welfare services: A feasibility study

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Abstract

Transportation of evidence-based programs (EBPs) to a new cultural setting is often preferred over the comprehensive process of developing a new program. Intervention fidelity has been suggested as a predictor of successful transportation. The present study examined whether fidelity and parent behavior improved when implementing the U.S.-developed Attachment and Biobehavioral Catch-up (ABC) intervention in Norwegian child welfare services (CWS). 11 child welfare workers received training and supervision to become ABC parent coaches. Fidelity was assessed through video-recordings of parent coaches' in vivo feedback at each home-visit session. Parent sensitive behavior was assessed using video-recordings of parent–child interactions, recorded before each ABC session. Mixed effects modeling showed that ABC fidelity increased over the course of training and supervision. Furthermore, parent behavior improved over the course of families' exposure to the intervention. These demonstrate that an EBP transported to a novel cultural setting can obtain promising levels of fidelity and intervention outcomes.

KEYWORDS

child welfare services and systems, children exposed to violence, clinical practice in social work, global north/Western/developed countries, implementation research, intervention research, mental health treatment and services

INTRODUCTION

A wide range of evidence-based programs (EBPs) exist for children who have been exposed to early adversity (Latzman et al., 2018; Schoemaker et al., 2019), but the majority of these programs are developed and tested within the U.S. and other English-speaking countries (Macdonald et al., 2016). The transportation of EBPs to countries where they are needed is often preferred to the costly and time-consuming process of developing a program from scratch (Gardner, 2017). However, transporting an intervention typically involves implementation in a setting with different norms, resources and modes of delivery (Moore et al., 2021). These contextual factors may reduce the impact of the intervention, making it harder to reproduce the same outcomes as found in the

original setting. Hence, some EBPs fail to find the same effects when implemented in a new cultural context (Sundell et al., 2016).

Factors such as intervention fidelity have been suggested as predictors of successful impact of an EBP in a novel setting (Aarons et al., 2017). Fidelity denotes the extent to which an intervention is conducted as intended by its developers (Carroll et al., 2007) and ensures that it is the intervention, and no other factors, that produces the effect. Previous studies have found an impact of fidelity on engagement and attendance (Breitenstein et al., 2010; Manz et al., 2017), as well as on intervention outcomes including caregiver interactive behavior (Eames et al., 2009; Smith et al., 2013) and child educational skills (Marti et al., 2018). Conversely, drift in fidelity over time has been found to predict less improvement in child problem behavior (Chiapa et al., 2015). The impact of fidelity on intervention outcomes, however, is small and there is much variation across studies (Collyer et al., 2020), which suggests that other factors may be at play. For instance, fidelity to an intervention's active ingredients (i.e., the components that are essential for bringing about change), as opposed to adhering to an intervention's nonessential ingredients, is expected to be more strongly associated with intervention outcome (Abry et al., 2015).

Specific, immediate feedback during interactions between parents and children are known as "in vivo coaching"—has been proposed as an active component in parenting interventions (Shanley & Niec, 2010). This kind of feedback emphasizes the family's real-life behaviors, as opposed to role-playing or description of hypothetical concepts. It is also immediate, in the sense therapist comments occur in close temporal proximity to parent behavior, which allows parents to practice or adjust their behavior shortly after the original behavior. A few studies have found in vivo feedback to affect parent behavior (Barnett et al., 2014; Barnett et al., 2017; Heymann et al., 2021), which supports its role as an active ingredient in parenting programs.

In-vivo feedback is one of the core components of Attachment and Biobehavioral Catch-up (ABC). ABC is a home-visiting program for infants and toddlers who have experienced adversity (Dozier et al., 2006). The term "in the moment" (ITM) commenting is used to describe in-vivo feedback provided by ABC coaches during parent–child interaction. Home-visit sessions are video-recorded, from which coaches' quality and rate of comments of parent behaviors are coded to measure coach fidelity to ABC (Meade et al., 2014). The commenting rate and quality of ITM-comments have been found to be associated with change in parental behavior, including intrusiveness and sensitivity (Caron et al., 2016).

According to Fixsen and colleagues' active implementation framework (Fixsen et al., 2005), core implementation components such as training and coaching are instrumental in creating and supporting practitioner fidelity behavior. This is supported by extensive research on EBP implementation in general (e.g., Durlak & DuPre, 2008; Edmunds et al., 2013), as well as on research on the ABC program. In particular, parent coaches' ITM commenting rate increased significantly across 1 year of training and fidelity-focused supervision (Costello et al., 2019). Another study compared the role of small-group consultation sessions ("consultation as usual") to half-hour fidelity supervision sessions and found that fidelity increased substantially after fidelity-focused sessions were introduced (Caron & Dozier, 2019). Similarly, Caron and Dozier (2021) found that coaches' frequency of ITM comments, their accuracy in self-coding and their proportion of on-target ITM comments increased over 1 year of fidelity-focused consultation.

Despite having been tested extensively in randomized controlled trials and community settings in the U.S., the transportation of ABC to non-U.S. settings has not yet been examined. The present study examined the longitudinal patterns of fidelity and parent behavior among parents and employees in child welfare services (CWS) in Norway. This was part of a feasibility study in which a group of Norwegian CWS workers were trained and supervised to become ABC parent coaches by the ABC developers from the University of Delaware. Parent coach fidelity was hypothesized to increase over the course of each coach's certification process, while parent sensitive behavior was hypothesized to increase during the 10 home-visit sessions provided to each family.

METHODS

Intervention

ABC is a manualized home-visiting program, which takes place over 10 sessions, for children who have experienced adversity at an early age. Previous efficacy studies have found ABC to have a positive impact on parental sensitivity (Bick & Dozier, 2013), attachment quality (Zajac et al., 2019), cortisol regulation (Bernard et al., 2014), and emotion regulation (Lind et al., 2014), as well as long-term impact from follow-up studies on receptive vocabulary (Bernard et al., 2017), theory of mind skills and cognitive flexibility (Lewis-Morrarty et al., 2012). The present study utilized the ABC infant model (ABC-I) for children aged six to 24 months, which is aimed at three targets: (1) to provide nurturing care in response to child distress; (2) to follow the child's lead with delight (i.e., positive attention in response to child-initiated behavior); and (3) avoiding frightening behavior. ABC is delivered in the form of video-feedback, discussions on the manual content and ITM comments.

Procedure

The present study was initiated by a team at the Center for Child and Adolescent Mental Health, Eastern and Southern Norway (RBUP). Prior to commencing the study, approval was obtained from the Norwegian Centre for Research Data (NSD, project nr.: 56433). CWS leaders across Eastern and Southern Norway were approached during 2017 regarding their service's participation in the feasibility study. Seven CWS services were thus included in the study, from which 13 CWS workers were invited to receive training in ABC. All CWS workers started a 2-day training seminar in February 2018, but two dropped out before starting supervision and coaching of families. Group-based clinical consultation and fidelity-focused supervision were carried out weekly via video-conferencing. Clinical supervision was carried out by representatives of the ABC-team from the University of Delaware and involved reviewing videos from coaches' home-visit sessions, discussion of individual cases and feedback on the delivery of manual content. Fidelity-focused supervision was carried out by five Norwegian supervisors who were certified as ITM supervisors by the ABC-team before providing supervision to the parent coaches. Moreover, the ITM supervisors received supervision from the ABC-team throughout the data collection period.

Parent coaches recruited families who had children between ages six to 24 months and were currently receiving help from the CWS. Primary caregivers who lived with their children were asked to participate. If both parents lived with the child and were considered primary caregivers, the parent who was able to commit to 10 weekly home-visits was included in the study. Families were excluded in cases where (1) the child was placed in foster care or a decision had been made to place the child in foster care; (2) the child's caregiver had severe mental health problems or active drug abuse issues; or (3) caregivers did not speak Norwegian. In one case, a caregiver who spoke fluent English was included and the intervention was carried out in English for that participant. Written consent was retrieved from all participants.

Participants

Parent coaches

Participants in the current study consisted of 11 CWS workers from seven CWS offices in Eastern and Southern Norway. The age of the participants ranged from 29 to 52 years ($M = 40.0$). Ten of the participants were women (90.9%). Four had completed a Masters' degree (40%), whereas the rest had a bachelor's degree. Eight had completed one or multiple years of supplemental education (72.7%). Eight had received training in other manualized interventions, in which the most common were Circle of Security ($N = 4$, 36.4%), International Child Development Program ($N = 3$, 27.3%) and Marte Meo ($N = 2$, 18.2%)—these are all relationship-based interventions that are available in Norway.

Families

Participants in the current study consisted of 27 families. All caregivers who participated were the child's biological parent, of which 23 were mothers (85.2%) and four were fathers (14.8%). Their age ranged from 21 to 60 years ($M = 31$). Sixteen were ethnically Norwegian (59.3%). Eighteen had previously received help from the CWS (66.7%) and 14 were currently receiving other help from the CWS while receiving ABC. Data regarding families' reasons for referral to the CWS were not collected, but national data indicate that the most common reports of concern are lack of parenting skills, parental substance abuse and high levels of violence/conflict at home (Statistics Norway, 2022).

Measures

Demographics

Demographic information from families and parent coaches was collected using questionnaires specifically designed for the present study. Items included questions on age, gender, education, ethnicity, and previous experiences with the CWS.

Parent behavior

Parent behavior was assessed using video-recordings of semistructured play interactions between parent and child. Behaviors were coded with an adapted version of the NICHD Observational Record of the Caregiving Environment (ORCE; NICHD, 1996) which has been used in previous studies on ABC (e.g., Caron et al., 2016). In contrast to the original NICHD instrument which uses a 4-point scale, the adapted version of ORCE uses a 5-point scale. Parent behavior was a composite score of sensitivity and intrusiveness, in which high levels of sensitivity was assigned to caregivers who were attentive to the child's cues and reacted appropriately based on the child's signals. Conversely, low ratings were assigned if they seldom reacted to the child's signals and/or did not display

an awareness of the child's needs. A high score of intrusiveness was assigned if the child was allowed little autonomy and/or the caregiver frequently imposed their own agenda on the child, regardless of signals from the child that another kind of interaction was needed. A low score of intrusiveness was given to parents who more readily allowed the child autonomy and were less likely to impose their own agenda on the child. Similar to previous studies on parent–child interaction (e.g., Azak, 2012), parental intrusiveness was reverse-scored and combined with sensitivity in a composite score of parent behavior.

Two coders coded all 270 videos on parent behavior, with each family being randomly distributed to one of the two. Coders were given videos labeled with a random letter code (generated at www.random.org) and were thus blind to the sequence of home-visit sessions. One additional coder double-coded two randomly drawn home-visit recordings from each family. Quadratic weighted kappa (k; Cohen, 1968) was used to determine interrater-reliability, with scores being satisfactory for both sensitivity ($k = 0.65$) and intrusiveness ($k = 0.67$). The internal consistency of the composite measure parent sensitive behavior was $\alpha = 0.72$, with values over $\alpha = 0.70$ commonly being used as an acceptable level of reliability (Cortina, 1993).

ABC Fidelity

Parent coaches' ITM feedback was used as a measure of ABC fidelity, using a coding system developed by Dozier and colleagues (Meade et al., 2014). Five-minute video clips are randomly drawn from the 1-h-long home-visit session, from which parent target behaviors are coded first, followed by the coding of coach responses to the parent's behavior. These responses are coded as either on or off target, in addition to the number of information components contained in the coach's comment. Any given comment may contain up to three information components: (1) describing the parent–child interaction; (2) connecting this behavior to the intervention target (e.g., following the lead); and (3) linking this to future outcomes (e.g., improving the child's self-regulation). If a coach neglects to react to a behavior target, it is coded as a "missed opportunity". In the present study, two aspects of ITM feedback were used as measures of fidelity: (1) average commenting *frequency* per minute, which is calculated by taking the total number of on-target comments and dividing them by the 5-min duration of the clip; (2) commenting *quality*, which is computed by taking the number of information components from all on-target comments (ranging from zero to three for each comment) in the 5-min clip and dividing them by the number of on-target comments. The ABC certification fidelity standards state that, after a year of training and supervision, coaches should be able to demonstrate a minimum of one on-target comment per minute and a minimum of one component on average. These standards need to be maintained for seven of the 10 last home-visits for the coach to be certified.

The five fidelity supervisors carried out ITM coding on all 10 home-visits for each family, 270 videos in all. To assess reliability, two video clips were randomly drawn from each family and double coded. Single measures intraclass correlations (ICCs) demonstrated excellent reliability (Cicchetti, 1994), with 0.89 for commenting frequency and 0.82 for commenting quality.

Statistical analysis

This study used linear mixed effects modeling to examine the development of parent behavior and ITM-comments. Families (Level 1) were nested within parent coaches (Level 2), who were nested within their respective CWSs (Level 3). Growth in parent sensitive behavior, ITM-frequency and ITM-quality was modelled separately, with each model accounting for three-level clustering and repeated measures within Level 1. Time was used as the independent variable in all three models, ranging from 0 to 29 (i.e., the number of measurement times for each parent coach) for the two ITM models and 0 to 9 (i.e., the number of measurement times for each parent) for parent sensitivity. Models that best suited the hypothesized associations, with complex random structures, were initially selected. Given unstable models or models with extreme confidence intervals, the random structure was simplified until an acceptable version was found (Pinheiro & Bates, 2000). R version 4.0.5 with the *nlme* package was used for mixed effect modeling (Pinheiro et al., 2020).

RESULTS

Fidelity

Parent coaches demonstrated an increase in both commenting frequency and commenting quality during the certification period. The slopes of both models were significantly larger than zero, indicating that both ITM frequency and quality increased during the period parent coaches received fidelity-focused supervision. As shown in Table 1, the estimated number of comments per minute (i.e., ITM-frequency) started at 0.73 for the first home-visit and increased by 0.029 for each session. This

TABLE 1 Fixed effects from linear mixed effects models

Description	Coefficient	95% CI	*p*
ITM frequency			
Intercept	0.73	0.48–0.99	<0.001
Slope	0.029	0.013–0.045	<0.001
ITM frequency			
Intercept	1.18	0.98–1.37	<0.001
Slope	0.013	0.004–0.023	0.007
ITM frequency			
Intercept	3.56	3.24–3.88	<0.001
Slope	0.034	0.005–0.062	0.021

Abbreviation: CI, confidence interval.

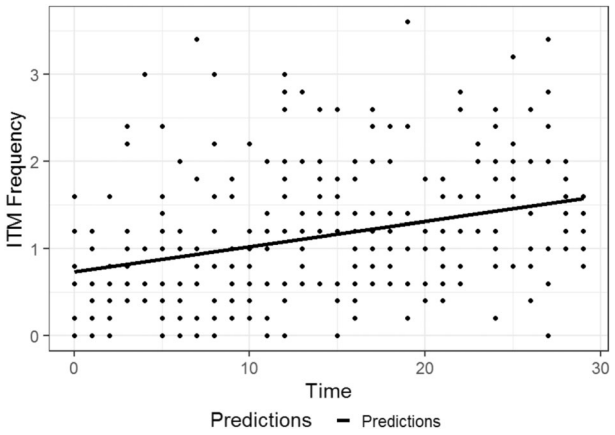

FIGURE 1 ITM frequency during period of fidelity-focused supervision

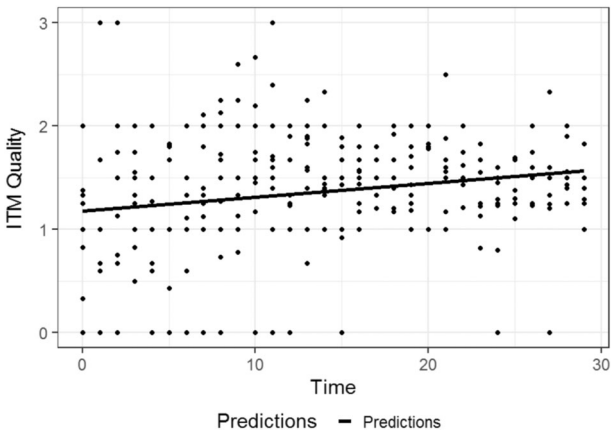

FIGURE 2 ITM quality during period of fidelity-focused supervision

model consisted of random effects for intercepts at all levels, but not random effects for slopes at any level. As shown in Figure 1, coaches reached the standard of one comment per minute by the 10th session. Furthermore, the estimated average number of information components for each on-target comment (i.e., ITM-quality) started at 1.18 for the first home-visit and increased by 0.013 for each session. This model consisted of random effects for intercept at both coach and family level, but no random effect for intercept at service level or any random effects for slopes. As shown in Figure 2, coaches reached the standard of one component per comment already at the first session.

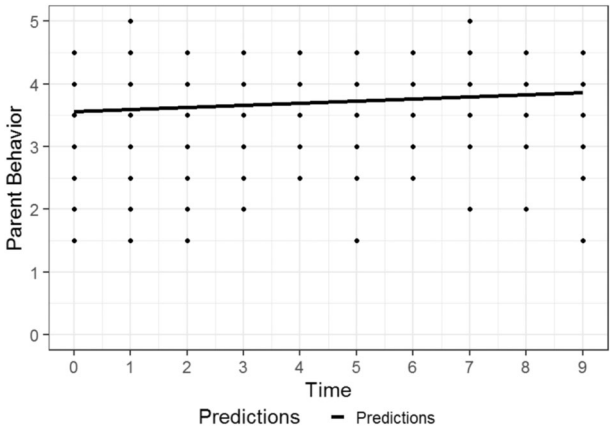

FIGURE 3 Parent behavior during period of 10 ABC home-visit sessions

Sensitivity

Parent sensitive behavior increased over the course of families' exposure to the ABC intervention. The slope was significantly larger than zero, indicating that sensitivity increased markedly over the course of the 10 home-visiting sessions. As shown in Figure 3, the estimated level of sensitivity started at 3.56 before families received ABC and increased by 0.034 for each home-visiting session. This model consisted of random effects for intercept and slope at family level, but no random effects for coefficients at coach or service levels.

DISCUSSION

The current study found support for the hypothesis that fidelity would increase during training and consultation for CWS workers who were part of an ABC feasibility study in Norway. Parent coaches were estimated to experience a small but significant increase in the number of comments provided per minute, in addition to a small but significant increase in the information components contained in each on-target comment. These findings are in

line with studies showing enhanced practitioner fidelity after training and consultation (Edmunds et al., 2017; Wong & Ruble, 2018), and, more specifically, studies demonstrating improvements in fidelity following consultation that utilizes feedback on fidelity data (e.g., Eiraldi et al., 2018; Valentine et al., 2021; Webster-Stratton et al., 2014). The finding that parent coaches improved substantially in their in vivo commenting skills is consistent with the findings from community-based studies of ABC in the United States (Caron & Dozier, 2019; Costello et al., 2019) and suggests that transportation of EBPs to novel contexts may be successful if combined with rigorous training and consultation.

Moreover, the finding that parent coaches were able to reach the ABC fidelity standards quite early in the certification process adds additional support to the success of the transportation of ABC to a novel setting. In the present study, coaches tended to have reached the target of one comment per minute and one component per comment by the 10th home-visit. Considering how they obtained this level of fidelity after just coaching a single family, it seems likely that they would be able to meet the ABC fidelity standards quite early in the process. In other words, receiving fidelity-focused consultation and providing coaching over the course of 30 sessions may not be necessary to reach the ABC fidelity standard. Since CWS workers and leaders regard the time spent on training and supervision as a considerable challenge (Bergsund et al., 2022), making this process less time-consuming could help facilitate implementation of the program on a larger scale. On the other hand, the finding that coaches reach high fidelity levels early on does not account for other factors they may gain from extensive training, such as use of active learning behaviors (Caron et al., 2021) or improvements in self-coding accuracy (Caron & Dozier, 2021). Furthermore, the amount of experience gained by coaching three families, coupled with the consultation received throughout, might be a prerequisite for maintaining fidelity in the future. A previous study on ABC fidelity found that ITM-frequency and percentage of on-target comments was sustained for 1 year after fidelity-focused consultation had ended (Caron & Dozier, 2019). It may be that this maintenance of coaches' fidelity level is a product of their comprehensive training and consultation and that, had their training and consultation been shortened, their level of fidelity may not have been sustained.

The hypothesized growth in sensitivity was also supported, showing that parent sensitive behavior improved over the course of 10 weekly ABC sessions. These results reflect similar findings on ABC in the U.S., both in community and university settings (Bick & Dozier, 2013; Caron et al., 2016; Perrone et al., 2021). Parent sensitivity is an important measure of the parent–child relationship and its well-established link to attachment security (Fearon & Belsky, 2016) underscores the importance of parent sensitivity to children's well-being. Even though the present study did not assess attachment quality, previous research on ABC suggests that children who received the intervention had higher rates of secure attachment, as well as reduced rates of disorganized attachment (Bernard et al., 2012; Dozier et al., 2009; Zajac et al., 2019). Additionally, previous research suggests that repeated measures of parent sensitivity may be an even better predictor of child attachment compared to single observations (Lindhiem et al., 2011). Therefore, given the high level of fidelity to the ABC manual and improvements in sensitivity in the current sample, it seems likely that families who received ABC in Norwegian CWSs will experience some of the beneficial outcomes evidenced in samples in the U.S.

A few limitations to the present study should be acknowledged. First, the sample size was quite small, with only 11 parent coaches (i.e., Level 2). However, due to the longitudinal design of the study, there were multiple data points for each participant resulting in quite a large data set overall. Second, parent coaches were more highly educated than the average Norwegian CWS worker, which could influence the external validity of the study. In the present sample, 72.2% of coaches had completed supplementary education, compared to only 30% of CWS workers in a national sample (Beyrer & Hjem, 2020). Further, 40% had completed a Masters' degree, compared to only 7% in a national sample (Beyrer & Hjem, 2020). On the other hand, the sample was quite diverse in terms of other demographic characteristics, such as age and geographic location, which strengthens the external validity of the study. The present findings were also quite similar to previous studies in the U.S. (e.g., Costello et al., 2019) in which coaches primarily had Bachelors' degrees. It therefore seems likely that a sample of less educated CWS workers would be able to obtain acceptable levels of fidelity, though it may not necessarily be fully commensurate to the findings in the present study.

A third limitation was the lack of a post-measure of parent sensitivity. Observation of parent–child interaction was carried out before each ABC home-visit session, resulting in 10 observations for each family. But since there was no observation after the 10th home-visit, there are no data to indicate how sensitivity changed after the ABC intervention had been completed. On the other hand, the aim of the present study was not to compare pre- and post-measures of parent behavior, but rather to examine the development of sensitivity over time. Furthermore, the final ABC session does not raise any new

issues and is mainly focused on strengthening parents' existing skills such that expected changes resulting from the final session would likely be minor. A fourth limitation was the lack of measures that examined the impact of contextual factors on transportation. For instance, aspects of the Norwegian CWS setting that impacted the implementation of ABC could have been studied (e.g., perceptions of leadership support, acceptability, appropriateness, etc.). Future studies, perhaps using a qualitative or mixed method design, could explore this further.

In conclusion, the present study contributes important knowledge to the literature on transportation of EBPs to new cultural contexts and the impact this can have on practitioner fidelity and client outcomes. The findings presented here demonstrate that, with the aid of rigorous training and supervision, an intervention that has proven successful in the U.S. can obtain promising levels of fidelity and parent sensitivity when implemented in a novel cultural setting, such as Norway. However, more research is needed to investigate the effectiveness of ABC on more distal outcomes, including attachment, emotion regulation, stress levels and social–emotional competence, in the same cultural context. Future studies should look more closely into the contextual factors that affect the implementation of transported parenting interventions and the mechanisms that lead to successful transportation.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data are not publicly available due to privacy or ethical restrictions.

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