Evaluation of a French parent training program in young children with autism spectrum disorder

Evaluation d'un programme francophone de formation aux habiletés parentales dans le cadre des troubles du spectre de l'autisme

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Abstract

Parent training programs (PTs) in young children with autism spectrum disorders (ASDs) are known to reduce parenting stress and improve child's behavior and parent-child interactions. Few PTs are available to French speaking families. In order to provide them with this type of intervention, we developed a French parent training program of 12 bimonthly sessions and three individual home visits based on applied behavior analysis. The purpose of this study is to evaluate the social validity and efficacy of this new PT on eighteen parents who have a child with ASD and developmental delay. For sixteen parents, the PT was considered effective, the objectives targeted important and the strategies learned acceptable for use with children. They have significantly improved their knowledge in ASD and behavioral intervention strategies and their children's socialization skills, and reduce their parental stress. This new French PT program seems to be a promising intervention.

Keywords: autism spectrum disorders, parent training, parenting stress, family quality of life, social validity

Résumé

Objectifs

Le programme intitulé « L'ABC du comportement de l'enfant ayant un TSA : Des parents en action! » est un programme psychoéducatif de 12 séances de 2 heures et de 3 visites à domicile destiné aux familles de jeunes enfants âgés jusqu'à 7 ans et ayant un trouble du spectre de l'autisme (TSA) avec retard de développement. Ce programme de formation aux habiletés parentales (PFHP), basé sur l'analyse appliquée du comportement, a été développé en réponse au besoin de formation des parents issus d'une population francophone pour faire face au stress qu'engendrent les difficultés de comportement de leur enfant en environnement familial. Cette

nouvelle intervention offerte en groupe, a été proposé à 30 parents sur un premier site francophone. Cette étude vise à évaluer la validité sociale et l'efficacité de ce nouveau PFHP.

Méthode

Ce PFHP a été proposé à trois groupes consécutifs de 4 à 6 familles. Il a été évalué auprès de 18 parents et 10 enfants. Pour évaluer la validité sociale du programme, les parents ont rempli des questionnaires sur la signification sociale des objectifs ciblés, l'acceptabilité des procédures utilisées et l'importance sociale des effets obtenus. L'efficacité du PFHP est évaluée au travers de questionnaires remplis en pré intervention, post intervention et en suivi trois mois après la fin du programme. Ces questionnaires portent sur les connaissances des parents, le niveau de stress parental, les symptômes dépressifs et les comportements de l'enfant.

Résultats

Parmi les 18 participants, 16 parents sont satisfaits de l'intervention. Ils considèrent les objectifs ciblés comme importants, les procédures transmises comme acceptables à utiliser et les compétences parentales développées comme satisfaisantes. Le PFHP a été efficace tant au niveau des problématiques parentales que des acquisitions des enfants. Une augmentation des connaissances et des pratiques éducatives est observée avec une diminution du stress parental. Une amélioration des compétences sociales des enfants est également constatée. Le PFHP n'a cependant pas été bénéfique pour une famille dont la situation s'est détériorée.

Conclusion

Ce PFHP est une intervention prometteuse pour répondre aux besoins de formation des familles des jeunes enfants avec un TSA et un retard de développement. Il reste toutefois insuffisant pour répondre aux besoins des parents en grande détresse. Un manuel de ce PFHP a été élaboré afin de le proposer à un plus grand nombre de parents sur différents sites francophones pour valider les effets du programme.

Mots clés : trouble du spectre de l’autisme ; habiletés parentales ; stress parental ; qualité de vie familiale ; validité sociale

1. Introduction

Autism spectrum disorders (ASDs) are not only affecting the development of the diagnosed child, but also of their entire family. Children with ASD have pervasive deficits in social interactions and communications, as well as repetitive and restrictive patterns of behavior (American Psychiatric Association, 2013). As a consequence, parents of children with ASD face many challenges that often affect their well-being and family's quality of life (Kuhlthau et al., 2014, Cappe, Wolff, Bobet & Adrien, 2012). It is well known that families of children with ASD are at risk for increased stress and symptoms of depression compared with parents of typically developing children and children with other developmental disorders (Hayes & Watson, 2012). High level of parenting stress can also have a reciprocal negative effect on the child by creating a negative feedback cycle and exacerbating the difficulties encountered (Sikora et al., 2013). Therefore, it is necessary to provide those families with support to help them face the specific challenges associated with this diagnosis (Karst & Vaughan Van Hecke, 2012).

Factors contributing to parents' well-being and family's quality of life form a complex system that include links between child-parent-services characteristics, as well as surrounding sociocultural contexts (Cappe et al., 2012; Gardiner & Iarocci, 2012). Researchers have found parenting well-being to be significantly impacted by the severity of the child maladaptive behavior (Benson, 2010; Ingersoll & Hambrick 2011; Sikora et al., 2013; Weiss, Cappadocia, MacMullin, Viecili & Lunsky,2012), and linked to the type of coping strategies used by parents as well as the extent of social support they receive (Benson, 2010; Cappe, Wolff, Bobet & Adrien, 2011). Moreover, temporal, financial, and practical limitations are added to the challenges encountered when raising a child with ASD (Kuhltau et al., 2014). Several researchers suggest that interventions aimed at facilitating the parents' ability to use positive behavioral and cognitive coping strategies to face those challenges may be beneficial for the parents involved (Benson, 2010; Cappe et al., 2011; Karst & Vaughan Van Hecke, 2012)

Parent training programs (PTs) in ASD are known to be one way of improving both parent and child functioning (Bearss, Burrel, Stewart & Scahill, 2015; Schultz, Schmidt & Stichter, 2011; Steiner, Koegel, Koegel & Ence, 2012). PTs provide parents with information and skills to improve their parenting adjustment and experience. The potential benefits for the families are improvements in child behavior, better parent-child interactions, reduced stress for parents as well as an increasing parenting sense of competence. Such interventions are available in English in a wide range of format and the outcomes are well documented (Bearss, et al., 2015; Schultz, et al., 2011; Steiner, et al., 2012), but the effects of culture and language are rarely taken into consideration (Jones et al., 2011).

In 2012, the French National Authority for Health published a guide on evidence-based practices for children and youth with ASD. They recommended developmental and behavioral interventions as well as the possibility for parents to participate in PT programs (Haute Autorité de Santé, 2012). However, PT programs in ASD are still recent in French speaking countries and only a few of them have been developed and are being evaluated (Stipanicic, Couture, Rivest, & Rousseau, 2014). Moreover, little is known on the contents and outcomes of such PTs, making it very difficult to disseminate them elsewhere. There is indeed a real need in French speaking countries to develop structured PT programs to facilitate an implementation by different clinicians across different settings and it is necessary to test their effects on entire families (Johnson et al., 2007).

Therefore, a French PT program named « L'ABC du comportement de l'enfant ayant un TSA : Des parents en action! » (« *ABC of children with autism spectrum disorders: Parents in action!*

») was developed for parents of children with ASD and developmental delay until the age of 7 (Ilg et al., 2014). This program consists of 12 bimonthly group sessions of 2 hours and 3 home visits. It was designed to provide parents with the skills and support to improve their parental experience through positive behavioral and cognitive coping strategies (aimed at solving the problem or doing something to change the source of stress). It gives parents quality information about ASD and evidence-based practices in order to enhance daily living skills, communication skills and to reduce challenging behaviors. (Wong et al., 2015). Parents progressively learn to apply behavioral strategies such as antecedent's strategies or differential reinforcement within the child's natural environment and every day routines in order to encourage the desired behaviors as well as prevent challenging behaviors at home (Schreibman, et al., 2015). To do that, they target small individual objectives during the program (staying seated for 3 minutes during lunch time, washing hands, making one request, etc). They are trained to gain confidence in their parental abilities so that they can better adjust to their child's characteristics and improve family quality of life in general. The use of a group format rather than individual sessions also provide parents with social support (Benson, 2010).

In order to validate and disseminate new interventions such as this French PT, guidelines of research on psychosocial interventions for autism propose a four steps evaluation sequence (Smith et al., 2007). First, an initial efficacy study must be conducted to establish an intervention as promising. To evaluate if the intervention is promising, it must be standardized in a manual to allow for replication across sites. The next steps are to test the efficacy in randomized clinical trials test under controlled conditions and to conduct community effectiveness studies.

To estimate a new intervention as promising or evaluate the way it is perceived by the participants across sites, it is also essential to evaluate its social validity in addition to its efficacy. Social validity measures the acceptability and viability of an intervention (Schwartz

& Baer, 1991). Users are asked about social significance of the objectives targeted by the intervention, acceptability of the procedures used and satisfaction with the results (Carter, 2010; Wolf, 1968). Negative assessments are as valuable as positive ones to predict which interventions might be acceptable or not to their relevant audience (Schwartz & Bears, 1991). There can also be differential outcomes within a same intervention. Knowing such information can help refine and individualize service delivery (Robbins, Dunlap, & Plienis, 1991).

An initial efficacy study on the PT program « Parents in Action: an ABC of children with autism spectrum disorder » was conducted in France with a pilot group of six parents (three couples) to establish if this new intervention was promising (Ilg et al., in press).

At the end of the PT, parents of children with ASD and developmental delay had significantly improved their knowledge in ASD and behavioral intervention strategies. They were also asked their opinion about the social validity of the program. All parents found the strategies used as acceptable and the objectives targeted by the PT as important and necessary. They all recommended this PT to other families and considered continuing using the behavioral intervention procedures they had learned. Four parents reported an improvement in their child's behavior. Following this first application, the contents were refined according to the parent's comments to improve the intervention (Ilg et al., in press).

The aim of the present study is to test social validity and efficacy of this modified version of the PT program with a larger number of participants in a French Mental Health Hospital. This modified version was offered to three groups of parents from the same site and manualized to be tested later on other French speaking sites in France and in the French speaking Province of Québec, Canada.

2. Method

2.1. Participants

Parents of children with ASD were recruited from the child psychiatry division of the Health Center at Rouffach in France. To be eligible for this trial, children had to have an autism spectrum diagnosis based on at least one well-established diagnostic instrument such as the French version of the Autism Diagnostic Observation Schedule (Lord, et al., 2000) or the French version of the Autism Diagnostic Interview-Revised (Lord, Rutter, & Le Couteur, 1994). To be included in the study, the children also had to be between 2 and 7 years of age and have documented evidence of language delays. It was requested that both parents participate in the PT.

Fifteen families (30 parents) attended the parent training program. Fourteen families (28 parents) agreed to participate in the research study. In total, 18 complete sets of data were collected and were included in the current analysis. Two couples did not complete all the questionnaires at the end of the program by lack of time, one couple attended another group more adapted to their child whom had a higher level of language, three fathers dropped out of the group for reasons related to their work, while their partner continued to participate in the PT, and one of the mother who continued without her partner did not complete all the questionnaires.

The participating parents ranged from 26 to 55 years old with a mean of 35 years (*SD* = 7.2) and represented a wide range of social and cultural backgrounds. None of them had participated in any formalized parent training programs. All participating children were 3 to 5 years old with a mean of 3.8 years (*SD* = 0.79). They all had a diagnosis of autistic disorder and developmental delay. Children had various therapies and services at the beginning of the PT. All participants' homes were in a 60 km area (37.28 miles) from the health center (Table I).

Insert table I here

2.2. Procedure

Specific content of the PT is outlined in Table II. Parents attended 12 bimonthly group sessions and 3 home visits. Each session was 2h in duration and included a time to let every participant introduce their progress and difficulties following the application of strategies since the last session, a time to learn new concepts through a presentation with slides and a time to discuss future home activities. Parents were each time given homework assignments to complete between sessions. They learned how to implement behavioral strategies at home to teach their child new adaptive skills. At the end of each sessions, they received sheets with a summary of the contents, home activities, and the slides presented.

Insert table II here

Each time, the PT is proposed to at least four families and at most six. The 12 bimonthly sessions last over six months. The last home visit being held three months later, the PT's total length is nine months. Three consecutive groups were held on a period of two years from September 2012 to September 2014: one group with five families (10 parents), one with six families (12 parents) and one with four families (8 parents). Each time, the parents were first met individually by a child psychiatrist to present the program. Then, a group session was held to meet the other parents and the two therapists who would lead the future group, as well as the therapist who would come at home. All 12 group sessions were led by a psychologist and a child psychiatrist. Home visits were conducted by a doctoral student in psychology who is also the 1st author of this paper. Therapists and setting were the same across all groups and the same as the pilot group. Children did not attend group sessions and childcare was available if needed during group sessions. PT was provided at no charge.

2.3. Measures

2.3.1. Social validity measures

The goals' significance were evaluated in pretreatment on a 5 point Likert-type scale question. Parents were asked if they agreed (from 1 'strongly agree' to 5 'strongly disagree') with the statement that parent training is important for a parent of a child with ASD. They then rated on a 5 point Likert-type scale (from "not at all" to "absolutely") the necessity for them to receive information on twelve topics related to ASD and behavioral management strategies.

Acceptability of treatment is measured in post treatment (the month following the end of the PT) with the *Treatment Evaluation Inventory Short-Form* (TEI-SF) (translated and adapted with permission from the authors) (Kelley, Heffer, Gresham, & Elliott, 1989). Items are designed to evaluate the acceptability, appropriateness and predicted effectiveness of a treatment. They are scored using a 5-point Likert-type scale, with 1 equaling strongly disagree and 5 equaling strongly agree. TEI-SF scores can range from 9 to 45, with higher scores representing greater acceptance of a given treatment. A "moderate" acceptability rating on the TEI-SF would result from a midpoint score of 3 on each item which gives a total score of 27. The internal consistency is strong ($r = .85$).

The *Therapy Attitude Inventory* (TAI) (Eyberg, 1993) is a measure of consumer satisfaction for use in parent training programs (translated and adapted with permission from the author). Ten questions evaluate in post treatment the impact of parent training on several areas: confidence in discipline skills, quality of the parent-child interaction, the child's behavior and overall family adjustment. They rate each item on a 5-point Likert-type scale, with 1 indicating dissatisfaction or a worsening of problems and 5 maximum satisfaction. The internal consistency is strong ($r = .88$).

Two 5-point Likert-type scale questions were also asked at the end of the program on future use of strategies and program recommendation to other parents. Higher scores represented a high probability to use these strategies in the future and a high level of recommendation.

Moreover, closed and open questions rated satisfaction related to the number of sessions, number of home visits and general improvements suggested.

2.3.2. Efficacy measures

Parents completed efficacy measures at pre- and post-treatment assessment and at 3-month follow-up.

A 30 multiple choice questionnaire was developed for this study to measure parents' knowledge on ASD and specific behavioral management strategies in natural contexts (Ilg, Clément, Hauth-Charlier, 2012 ; Annex 1). Scores can range from 0 to 30 with higher scores representing greater knowledge. Knowledge on ASD is evaluated with questions such as "A person with ASD generally has a good representation of what other people think, want and believe. Is it true, false or you do not know?". Knowledge on behavioral management strategies is evaluated with examples of situations in natural contexts. For example, "Maxim wants to watch television. He sits on the couch and starts yelling for someone to come. What should his parents do so he would stop yelling each time he wants to watch television?". Participants can choose between 5 different answers.

The French *Beck Depression Inventory- short form* (BDI-SF) is a 13-item self-report instrument intended to assess the existence and severity of symptoms of depression. Each item is rated on a 4-point scale. Total score of 0-4 is considered minimal range, 5-7 is mild, 8-15 is moderate, and 16+ is severe (Bouvard, & Cottraux, 2000). It has strong internal consistency, reliability and validity.

The French *Parent Stress Index* (PSI; in French: Bigras, LaFrenière, & Abidin, 1996) is a 101-item self-report instrument designed to evaluate the overall level of parenting stress that an individual is experiencing. Each item is rated on a 5 point Likert-type scale (from 'strongly agree' to 'strongly disagree): higher scores representing higher level of parenting stress. It yields a Total stress score, plus scale scores for both child and parent characteristics. The child domain evaluates sources of stress as gathered from the parent's report of child characteristics. There are six subscales: Distractibility/Hyperactivity, Adaptability, Reinforces Parent, Demandingness, Mood, and Acceptability. The parent domain measures sources of stress related to parent characteristics. There are seven subscales: Sense competence, Isolation, Attachment, Health, Role Restriction, Depression, and Relationship spouse/partner. The internal consistency of the French version is strong: child domain r = .91; parent domain r = .92; total stress score r = .95.

Family quality of life is evaluated by the French adaptation of the *Beach Center Family Quality of Life Scale* (FQOL) (translated with permission from the authors). It is a 25-item self-report inventory that measures several aspects of families' perceived satisfaction in terms of quality of family life. Each item is rated on a 5 point Likert-type scale (from very dissatisfied to very satisfied): higher scores representing higher family quality of life. The FQOL Scale contains five subscales: Family Interaction, Parenting, Emotional Well-being, Physical / Material Well-being, and Disability-Related Support. It has strong internal consistency (r = .88), reliability and validity (Hoffman, Marquis, Poston, Summers, & Turnbull, 2006).

The *Autism Spectrum Disorder-Behavior Problems for Children* (ASD-BPC) is an 18-item self-report inventory that assesses challenging behaviors in individuals with ASD. Each item is rated as 0 (not different; no impairment), 1 (somewhat different; mild impairment) or 2 (very different; severe impairment). The scale was translated in French with permission from the author (Matson, Gonzalez, & Rivet, 2008). The internal consistency is strong (r = .90).

The *Vineland Adaptive Behavior Scales I*: Interview Format (Sparrow, Balla, & Cicchetti, 1984) assesses adaptive functioning of the child on four domains: communication, daily living skills, socialization and motor skills. The standard scores of three domains were used in this study (communication, daily living skills and socialization).

2.3.3. Statistical analysis

Statistical analysis were conducted on descriptive data of efficacy measures. An assessment of the normality of data was first made with the Shapiro-Wilk Test. When the normality of data was met, results were analyzed by using repeated measures analysis of variance and Tukey post-hoc tests. Otherwise, the Friedman test and the Wilcoxon signed-rank test were conducted to examine any possible differences in outcomes.

3. Results

3.1. Social validity

Descriptive data of social validity measures are summarized in Table III. In pretreatment, all parents assessed the objectives targeted by the program as important or very important. They requested priority information on interventions to improve their child functioning. With a mean total score of 39.39/45 on the TEI-SF, parents also considered the strategies learned during the program as acceptable to use with their children. More precisely, all parents had a total score above 27 which is the cut off for moderate acceptability. Parents' level of satisfaction measured by the TAI at the end of the program was also high: the mean total score is 40.89/50. Similarly to the score of moderate acceptability in the TEI-SF (Kelley et al., 1989), a moderate score of total satisfaction was calculated by adding a midpoint score of 3 on each item of the TAI. The cut off for moderate satisfaction is 30/50. Those who have a score below this cut off are considered as dissatisfied whereas those who have a score above are considered as satisfied.

Only two persons were considered dissatisfied with total scores on the TAI of 19 and 28. More precisely, the results of this couple indicated a dissatisfaction for both of them concerning the effects of the program on their child's behavior. They had not seen any improvement after using the strategies learned in group. On the contrary, they reported having now more challenging behaviors at home and less confidence to face them. One of them also reported having learned very little and no useful strategies. As a consequence, this parent will not use those strategies in the future and was not sure whether to recommend the program to other parents.

For the 16 other parents, the program was useful to learn new strategies. They all experienced an improvement in their child's problem behaviors after using them. Fifteen parents reported being satisfied with the general progress their child had made (one person felt that the progress were not enough) and felt that the relationship between them and their child had improved (one person felt that the relationship was the same as before). Fourteen parents now felt more confident to manage their child's behavior (two parents felt as confident as before). Interestingly, for 14 parents the program had helped with other personal or family problems not directly related to their children (for two persons, the program has had no effect on these problems). All 16 parents planned to use the strategies learned in the future and to recommend the program to other parents.

Insert table III here

Parent's answers to the open questions were most of the time positive. They reported having especially liked the group format. They appreciated to share experiences with professionals and other parents, receiving and giving advice to face everyday challenges. They did not have much to say about the components they disliked. Some of them felt that the time granted to each family was sometimes unequal. Two persons criticized other parents' behaviors (impoliteness and too much talking). When asked about specific sessions, they often reported having

3.2. Efficacy

Schwartz and Bears (1991) suggest that it is essential for the advancement of applied behavior analysis to know what programs are liked and disliked, and why. Having such information can help to refine and individualize service delivery (Robbins, Dunlap, & Plienis, 1991). Therefore, knowing more about the differences of efficacy between parents who are satisfied with the PT compared to parents who are dissatisfied is necessary to improve such interventions in the future. For that reason, we decided to conduct an analysis to clarify the efficacy of the program according to the level of satisfaction of the parents.

3.2.1. Efficacy of the PT on satisfied parents

An analysis on the sixteen participants considered satisfied was conducted to precise the effects of the program. In this sixteen parents sample, the mean total score of the TAI is 43.06/50 (SD = 2.05). Descriptive data of efficacy measures in this sample are summarized in Table IV.

An evolution was found on the knowledge scale ($\chi^2_F = 17.52$; $p < .001$). Parent's level of knowledge on autism and behavioral strategies increased from pre to post treatment (T = 0. 00; z = 3. 30; $p < .001$). This result is maintained at follow up (T = 1. 50; z = 3. 20; $p < .001$).

No evolution was found on the BDI-short form ($F(2, 30) = 2.93$; $p = .07$). Tukey post-hoc tests show that parent's level of depressive symptoms tend to decrease between pre and post treatment ($p = .06$), but this effect does not last from pretreatment to follow up ($p = .28$). However, on a clinical level, it is interesting to observe that ten parents had a decrease from pretreatment to follow up. For eight of them, the total score lowered in a less severe range (3 from a moderate range to mild, 3 from a moderate range to minimal, 2 from a mild range to minimal). The two others had a total score that decreased but stayed in a minimal range from pretreatment to follow up. For four parents, an increase in the total score was observed. Only one of them had a total score that changed from minimal range to moderate range. The three others had a total score in the minimal range from pretreatment to follow up. Finally, two parents had the same total score at pretreatment and at follow up (one in the minimal range and one in the mild range).

No significant evolution was observed on the total stress score from the PSI (F (2, 30) = 2.02; $p = .15$). However, a significant evolution was found on the child domain (F (2, 30) = 6.28; $p < .01$). The decrease from pre-treatment to follow up is statistically significant according to Tukey post-hoc tests ($p < .01$). More precisely, among the domain, a significant diminution of stress was found on the following subscales: adaptability (F (2, 30) = 3.40; $p < .05$) and reinforcement (F (2, 30) = 9.97; $p < .001$). Parents perceived that their child adjusted better to change in the social environment ($X_{pretreatment} = 36.25$; $X_{post\ treatment} = 33.94$; $X_{follow\ up} = 34.37$) and felt more positively about their interaction with him or her ($X_{pretreatment} = 13.44$; $X_{post\ treatment} = 12.94$; $X_{follow\ up} = 10.69$). Interestingly, even though no evolution was found on the parental functioning domain (F (2, 30) = .51; $p = .61$), a change was observed on two subscales. First, the stress associated to the sense of competence tends to diminish (F (2, 30) = 3.12; $p = .06$). Parents tended to feel more comfortable and capable in their parental role at the end of the program ($X_{pretreatment} = 30.56$; $X_{post\ treatment} = 28.25$; $X_{follow\ up} = 28.94$). Second, it seems that the stress related to the parenting partner relationship increased over time (F (2, 30) = 3.69; $p < .05$). The couples were challenged when participating in this PT ($X_{pretreatment} = 16.94$; $X_{post\ treatment} = 17.44$; $X_{follow\ up} = 19.06$).

No evolution was found on the total score of FQOL (F (2, 30) = 1.59; $p = .22$). There is only one decrease on the different subscales. Parents tended to feel that they had more support in post treatment than in pretreatment ($\chi^2_F = 5.39$; $p = .07$).

Regarding the child challenging behaviors, the decrease on the ASD-PBC scale between pretreatment, post treatment and follow up is statistically not significant (F (2, 30) = 2.73; $p = .08$).

Similarly, on the *Vineland Adaptive Behavior Scales I*, no significant evolution were observed on the child's level of communication ($\chi^2_F = 3.61$; $p = .16$) and on the daily living skills domain ($F\ (2, 30) = 2.17$; $p = .13$). There is, though, an increase in the child's socialization skills ($\chi^2_F = 20.26$; $p < .001$). The score at post treatment is higher than in pretreatment (T = 10; z = 2.67; $p < .01$). This evolution continues 3 months later (T = 21; z = 2.43; $p < .05$).

Insert table IV here

Efficacy of the PT on dissatisfied parents. Given that there were only two dissatisfied participants, no statistical analysis could be made. Descriptive data of efficacy measures for both parents are summarized in Table V. Both parents experienced an increase of depressive symptoms and parenting stress between pretreatment-post treatment- and follow up. They also reported a deterioration in their family quality of life. The child challenging behaviors increased during the time of the PT and a regression was reported in the child's adaptive skills in all domains. On a clinical level, both parents reported having no social support to face their problems. They had a higher level of depressive symptoms and parental stress at the beginning of the PT compared to the mean scores of satisfied parents. According to one of the parents, their child had also more challenging behaviors.

Insert table V here

4. Discussion

A new PT program was developed to give French speaking parents of young children with ASD and developmental delay quality information about ASD and behavioral management strategies. The first experience of implementation with a pilot group resulted in a revision of its contents to improve the intervention. Therefore, the aim of the present study was to test the new version of the French « L'ABC du comportement de l'enfant ayant un TSA : Des parents en action! » with a larger number of participants from the same setting in France. Fifteen more families attended the PT program in three different groups. Finally, 18 parents could be included in the current study.

Results indicate that this intervention is effective to increase parents' knowledge on autism and behavioral strategies. According to Stipanicic et al. (2014), such an increase could be a short term effect of a PT. Although information is essential to better understand the diagnosis, it is not as effective as training to promote behavior change in the child (Bearss et al., 2015). This PT was created to promote knowledge gains but also to actively engage the parent in promoting skill acquisition and behavior change in the child (Bearss et al., 2015). Yet, according to efficacy measures, results do not indicate a significant change on children's challenging behavior, level of daily living skills nor on level of communication. This is surprising given that parents report on social validity measures having observed some improvements in their child's behaviors after using behavioral strategies. Indeed, several families reported achieving specific goals for their children. For example, one child was taught to stay asleep in his own bed, another child had started to take a bath without screaming, and one child had started to ask questions. Those small progress could be seen as a medium effect of the PT (Stipanicic et al., 2014). Parents are trained on small objectives in order to learn how to practice effectively behavioral strategies. Even small progress may have an effect on parent's satisfaction at the end of the program but are not sufficient to be seen on standardized ratings such as the ASD-PBC or the Vineland. Larger results require more time and intensive interventions. PTs that have an individual format (Bearss, Johnson, Handen, Smith & Scahill, 2013) or that target specific skills such as communication (Gengoux et al., 2015) might provide faster results and thus significant effects on developmental scales. One surprising effect though, is found on socialization skills measured by the Vineland. Those skills are not directly targeted by the PT like challenging behaviors, communication or daily living skills. Perhaps the parents were encouraged by the small progress and generalized the strategies learned to social and play times.

It is interesting to link those results to the decrease found on parenting stress. By participating in this PT, parent's level of stress due to child' characteristics decreases. The PT seems to have an impact on the child characteristics that contribute to overall stress. It positively influences characteristics such as the child's adjustment to change in the social environment, and the way parents perceive their interaction with their child. Moreover, parents reported on the satisfaction scale feeling more confident to manage their child's behaviors. They also felt an improvement in their relationship with their child. Several studies have documented an improvement in parent well-being following their participation in a PT (Minjarez, Mercier, Williams & Hardan, 2013; Tonge et al., 2006). Nonetheless, other studies have observed no impact on parenting stress (Aldred, Green & Adams, 2004; Drew et al., 2002). Results on those variables may be a long term effect of a PT (Stipanicic et al., 2014). Results on parent's level of stress due to parental functioning show however a negative impact on partner relationship. This is not such a surprise since learning new strategies implies an adjustment and may be stressful. It is even more complicated and stressful when those adjustments require cohesion between two persons. Parents also explained that the program has helped with others personal or family problems not directly related to their children. Unfortunately, the data collection tools do not allow to precise on which others personal problems the program has helped. A focus group would be interesting to have more qualitative information.

The whole results show that this intervention clearly provides parents with the skills and support to improve their parental experience through problem-focused coping strategies (strategies aimed at solving the problem or doing something to change the source of stress). However, problem-focused coping strategies are not always appropriate and sufficient to help parents in great distress (Benson, 2014; Falk, Norris & Quinn, 2014; Weiss et al., 2012). Indeed, results also indicate that there can be positive effects for some parents as well as a worsening of the situation for others within the same intervention. These results have important implication for future implementations of the PT. Families, just like children, differ and some of them would benefit from a PT whereas others would not (Robbins et al., 1991). Family services should consider parent's characteristics as well as children's characteristics in order to better individualize those services (Karst & Vaughan Van Hecke, 2012; Robbins et al., 1991). Because of the small sample, it is however difficult to explain why those parents had a deterioration of their situation compared to others (Schwarz & Bears, 1991). To improve the PT, it is important to know more about those different trajectories. Having this information will be essential to know how to adjust the intervention more precisely. Further studies need to specify the impact of PT on dissatisfied parents as well as on satisfied parents.

Although promising, this study requires replication and has several limitations. One of them is the small sample size. To this end, a large scale, multi-site study is currently underway at different centers in France and in the French-speaking Province of Québec. Another major limitation is the lack of a control group, which makes it difficult to interpret the statistically significant effects and to know whether those results could be achieved only with the effect of time or a support group. Finally, we relied solely on the parents' surveys and did not use objective measures regarding the acquisition of parenting skills in relation to their educational strategies. If more implementation can confirm those findings, the intervention may be suitable for use in a wide range of clinical settings.

Conflict of interest: none

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Table I: Descriptive characteristics of the study sample at the beginning of the parent training

Tableau I: Caractéristiques des participants au début du programme de formation aux habiletés parentales

Characteristics	*n*
Participating parents	18
Participating children	10
Parent gender	
Women	10
Men	8
Child gender	
Girls	1
Boys	9
Services	
Speech therapy	8
Physical therapy	2
Specialized services	8
No services	2
School programming	
Full time	1
Part time (6 to 12 hours/week)	8
Special education	1

Table II: Description of the parent training program named «Parents in Action: an ABC of children with autism behaviors »

Tableau II: Description du programme de formation aux habiletés parentales « L'A.B.C. du comportement de l'enfant ayant un TED/TSA : Des parents en action! »

Group sessions of 2 hours	Group activities	Home individual activities
Home visit 1	Meeting the parents and the child; discussing outline and goals of the program.	
1) Understanding the ASD diagnosis	Information on autism symptoms and evidence based interventions.	Describing the child profile.
2) Observing a behavior	Introduction to concepts of functions of behaviors, antecedents and consequences of behaviors and how to evaluate behavior.	Identifying two short-term individual objectives based on the child profile and the child's needs: one behavior to increase and one problem behavior to decrease. Observing a behavior by using Antecedent Behavior Consequence (ABC) charts
3) Using antecedent strategies and strengthening behaviors	Introduction to antecedents strategies to encourage desired behavior and prevent challenging behaviors. Introduction to the concept of reinforcers	Deciding the antecedent strategies for the 1st individual objective: the behavior to increase. Making a reinforcers inventory. Observing the problem behavior with an ABC chart.
4) Teaching new skills	Introduction to task analysis, shaping and chaining.	Applying intervention strategies for the 1st objective and taking measures.
5) Understanding and managing problem behaviors	Introduction to functional behavior assessment, functional equivalence behavior and to differential reinforcement.	Applying intervention strategies for the 2nd objective and taking measures.
6) Optional sessions	Information on one optional topic: toileting, feeding or sleeping issues.	Describing the child's skills in the topic addressed.

Home visit 2	Review previous group sessions, implementation of the intervention strategies applied at home, outcomes and difficulties.	
7) Generalization and maintenance of gains	Introduction to strategies on consolidating positive behavior changes.	Planning generalization and maintenance of observed positive behavior changes.
8) Communication skills : facilitate making requests	Introduction to naturalistic intervention strategies to facilitate making requests	Applying intervention strategies and taking measures.
9) Communication skills : teaching initiations	Introduction to naturalistic intervention strategies to teach initiation skills (asking questions, asking for help).	Applying intervention strategies and taking measures.
10) At school	Information on legislation related to school inclusion. Introduction to naturalistic intervention strategies to support preschool learnings.	Applying intervention strategies and taking measures.
11) Optional sessions	Information on one optional topic: toileting, feeding or sleeping issues.	Describing the child's skills in the topic addressed.
12) Identifying future goals	Summary of the behavioral management strategies addressed in the program. Review of intervention strategies used at home.	Identifying a future goal.
Home visit 3 months after the end of the program	Reviewing implementation of the intervention strategies applied at home, outcomes and difficulties. Discussing available resources to parents.	

Table III: Descriptive data of social validity measures (N=18)

Tableau III: Résultats aux mesures de validité sociale (N=18)

	Mean (Standard Deviation)	Minimum	Maximum
Significance of the goals /5	4.88 (0.33)	4	5
Acceptability of treatment /45	39.39 (4.39)	28	45
Satisfaction /50	40.89 (6.79)	19	47
Future use of strategies /5	4.50 (0.79)	2	5
Program recommendation /5	4.72 (0.57)	3	5

Table IV: Descriptive data of efficacy measures among parents considered as satisfied (N=16)

Tableau IV: Résultats aux mesures d'efficacité auprès des parents considérés comme satisfaits (N=16)

Means (Standard Deviation)	Pretreatment	Post treatment	Follow up
Knowledge scale	17.69 (3.52)	22.75 (4.14)	23.13 (4.41)
BDI – short form	5.13 (3.72)	3.50 (2.25)	4.06 (2.82)
Total stress score (PSI)	276.81 (37.28)	267.88 (33.17)	266.12 (31.79)
Child domain	144.06 (20.05)	137.62 (18.49)	132.75 (16.32)
Parental functioning domain	132.75 (23.00)	130.25 (21.51)	133.38 (19.91)
Family quality of life scale	93.25 (10.03)	97.18 (8.11)	97.13 (6.23)
Problem behaviors scale	11.50 (8.48)	8.03 (4.78)	8.03 (5.26)
Vineland I			
Communication	54.19 (6.41)	57.88 (8.26)	58.31 (7.51)
Daily living skills	63.94 (7.44)	61.56 (6.62)	62.81 (5.72)
Socialization	54.00 (4.60)	57.88 (9.00)	60.69 (6.83)

Table V: Descriptive data of efficacy measures among parents considered as dissatisfied

Tableau V: Résultats aux mesures d'efficacité auprès des parents considérés comme insatisfaits

	Parent 1			Parent 2		
Total scores	Pretreatment	Post treatment	Follow up	Pretreatment	Post treatment	Follow up
Knowledge scale	20	24	23	22	23	20
BDI – short form	8	13	14	10	12	13
Total stress score (PSI)	322	341	357	315	372	410
Child domain	168	171	178	142	187	199
Parental functioning domain	154	170	179	173	185	211
Family quality of life scale	99	99	81	98	48	55
Problem behaviors scale	17	19	27	10	14	18
Vineland I						
Communication	59	57	51	59	57	51
Daily living skills	63	56	58	63	56	58
Socialization	69	66	67	69	66	67

Annexe 1 : *Questionnaire d'évaluation des connaissances sur le Trouble du Spectre de l'Autisme (Ilg et al., 2012).*

Annex 1 : *Knowledge assessment questionnaire on Autism Spectrum Disorder (Ilg et al., 2012).*

Instructions:
The purpose of this questionnaire is to estimate your current knowledge on Autism Spectrum Disorder (ASD). We ask you not to consult external sources of information when you answer the questions.

Circle the letter corresponding to your answer.

1. **People with ASD have oral language delays:**
   A) Always
   B) Sometimes
   C) Never
   D) I don't know

2. **Understanding of oral language is not impaired in people with ASD:**
   A) True
   B) False
   C) I don't know

3. **People with ASD have difficulty communicating:**
   A) Always
   B) Sometimes
   C) Never
   D) I don't know

4. **4. People with ASD have difficulties in social relations:**
   A) Always
   B) Sometimes
   C) Never
   D) I don't know

5. **People with ASD avoid eye contact:**
   A) Always
   B) Sometimes
   C) Never
   D) I don't know

6. **People with ASD have an intellectual disability:**
   A) Always
   B) Sometimes

C) Never
D) I don’t know

7. **People with ASD have restricted and repetitive behaviors, interests or activities:**
A) Always
B) Sometimes
C) Never
D) I don’t know

8. **People with ASD have behavioral problems (throwing objects, aggression towards others, yelling):**
E) Always
F) Sometimes
G) Never
H) I don’t know

9. **How is ASD diagnosed:**
A) Biological (blood test)
B) Genetics (karyotype)
C) Clinical (observation of absence or presence of certain behaviors)
D) I don’t know

10. **Current number of children with ASD:**
A) 1 in 100 children
B) 1 in 1500 children
C) 1 in 15 000 children
D) I don’t know

11. **ASDs are more common among girls than boys:**
A) True
B) False
C) I don’t know

12. **The symptoms of ASD are very different from one person to another:**
A) True
B) False
C) I don’t know

13. **Compared with the rest of the population, individuals with ASDs may present the following:** (check the box that best corresponds to your answer)

	more frequently	as frequently	less frequently
Depression	☐	☐	☐
Anxiety	☐	☐	☐
Obsessive Compulsive Disorders	☐	☐	☐
Phobia	☐	☐	☐
Eating Disorders	☐	☐	☐

14. **Attentional difficulties are frequently found in children with ASD:**
A) True

B) False
C) I don’t know

15. People with ASD have hyper- or hyporeactivity to sensory input or unusual interests in sensory aspects of the environment :
A) Always
B) Sometimes
C) Never
D) I don’t know

16. People with ASD have extraordinary talents:
A) Always
B) Sometimes
C) Never
D) I don’t know

17. People with ASD are generally very good in attributing intentions, desires and beliefs to others
A) True
B) False
C) I don’t know

18. People with ASD are usually interested in details:
A) True
B) False
C) I don’t know

19. People with ASD usually adapt easily to changes:
A) True
B) False
C) I don’t know

20. A behavior is qualified as a challenging when (several possible answers) :
A) It poses a danger to the person
B) It poses a danger to others
C) It is likely to become more serious without intervention
D) It makes social integration difficult
E) It interferes with learning
F) None of the above
G) All of the above
H) I don’t know

21. Jordan’s father complains about his son's behavior at snack time and seeks advice from an educator on how to react. The intervener asks him at first to describe the problematic behavior. Which of the following is the most appropriate description?
A) Jordan is very stubborn
B) Jordan shouts and hits the table

C) Jordan is freaking out
D) Jordan gets angry
E) I don't know

22. To understand the function of Jean's behavior, one must:
A) Observe what happens before the behavior
B) Observe what happens after the behavior
C) Observe what happens before and after the behavior
D) None of the above
E) I don't know

23. Malika does not always put her toys back in the toy box. Her mother would like her to do it more often. She should:
A) Tickle her
B) Give her a candy
C) Let her watch TV
D) There is no way of knowing
E) I don't know

24. Whenever Amélie puts her toys back in the toy box, her mother also decides to:
A) Say nothing to her
B) Congratulate her for putting her toys back in the toy box
C) Congratulate her on being such a nice girl
D) Ask her to tidy up the rest of her room
E) I don't know

25. Lucie's father would like to teach her daughter to brush her teeth. How should he proceed?
A) He must give her explanations and let her try
B) He must teach her every step of this behavior
C) He must show her and let her try
D) I don't know

26. When his father asks him to clear the table, Hugo screams and is oppositional. Finding this inadmissible, his father "punishes" him by forcing him to take out the thrash. However, Hugo is becoming more and more oppositional when he has to clear the table.
For Hugo, taking out the thrash is:
A) Something pleasant
B) Something unpleasant
C) I don't know

27. Liam wants to watch TV. He sits down on the couch and starts yelling for someone to come and turn it on. Liam's parents would like to reduce their son's screaming. They should:
A) Answer Liam's screaming only from time to time
B) Ignore Liam's screaming

C) Ban him from watching TV
D) Reprimand him
E) I don’t know

28. Emma is a little girl who does not speak. She recently began using the sound "can" to ask for candies. Her mother decides to use this request as a way to develop her daughter’s language. Thus, when Emma says "ca" to get a candy, her mother should:

A) Tell her "candy" and wait for Emma to repeat
B) Repeat the sound "ca" and give her a candy
C) Tell her "candy" and give her one
D) Give her a candy
E) I don’t know

29. Visual aids are used to :

A) Promote autonomy
B) Decrease anxiety
C) Promote an understanding of the environment
D) None of the above
E) All of the above
F) I don’t know

30. Visual aids do not require learning to use them:

A) True
B) False
C) I don’t know