



Evaluation of the Impact and Social Validity of a Group Training Program for Parents of Children with Autism Spectrum Disorders



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Abstract

Autism Spectrum Disorder (ASD) is known to impact both the child diagnosed and their entire family. Parent-mediated intervention programs (PMI) have become increasingly popular to respond to the important needs experienced by these families. One of these programs, The ABCs of behavior in children with ASD: parents in action! was specifically developed for parents with children with ASD under the age of 8, leaving parent with older children without adapted support for their needs. A new adapted version of this program was developed for children aged 6 to 12 (V6-12). This study aims to assess the social validity and effect on parents of this new version. A mixed-methods approach using standardised questionnaires, home made questionnaires and semi-structured interviewed on a sample of 21 participating parents allowed to demonstrate significant improvement on self-reported parental competence, knowledge regarding ASD and parent-child relationship. Results also demonstrate high social validity and satisfaction of parent toward the program. This study contributes to the growing literature supporting the value of parent training.

Keywords: Autism spectrum disorders; Parent training; Elementary age; Evidence-based practices; Assessment

Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by deficits in social communication and by restricted and repetitive behaviors [1]. In recent years, an increasing number of diagnoses has been observed. According to the Centers for Disease Control and Prevention, 1 in 54 8-year-old children in the United States have been diagnosed with ASD [2]. The prevalence in Canada is 1 in 50 children aged 1 to 17 [3]. This new reality leads to a raising number of parents coping with the daily challenges associated with their school-age child's diagnosis [4].

ASD impacts both the child diagnosed and their entire family [5,6]. The difficulties experienced by children with ASD affect every aspect of their parents' daily life [4] particularly parental self-efficacy, parental stress as well as psychological and physical

health [4,7-9]. However, many studies have identified a host of factors associated with a better quality of life for these parents. These include a sense of competence regarding the education of a child with ASD [10,11]; a positive and optimistic view of the situation; a sense of responsibility and control [12,13]; and a social network to rely on for help and support [10-14].

A growing number of parents mediated intervention (PMI) programs have been developed [15,16]. These recognize parents as agents of change as they are invested in their child's life and rely on their insight and intrinsic motivation to improve their relationship with their child [17]. Parent intervention training enables parents to gain a better understanding of ASD and learn evidence-based intervention strategies, empowering them, in turn, to analyze and act on problematic situations as

they encounter them [18-20]. Recent studies demonstrate the effectiveness of such programs on family functioning [15,21], child-parent interactions [17], parental sense of competence and parental stress [22,23]

PMI present itself in a wide variety of formats (self-guided programs, one-on-one training with a therapist, group programs), durations, intensities and targeted outcomes for children with ASD. These outcomes include communication, social behaviors and challenging behaviors among other things [24]. However, most existing studies focus on children with ASD under 6 years of age [24]. To determine best practices and measure outcomes for PMI regarding ASD, it is essential to investigate and elaborate more programs, particularly those for parents of children aged 6 years or older.

In 2016, a parent training program was created for parents of children with ASD aged 0 to 7: The ABCs of Behavior in Children with ASD: Parents in Action! (ABC-ASD) [25]. This program effectively optimized the development of children with ASD while empowering parents and reducing parental stress [26]. Recently, in Quebec (Canada), clinical teams in health and social public services working with children with ASD observed a significant need for intervention programs targeting families with children aged 6 to 12. The growing need for this age-group could be an indirect consequence of the increasing number of children and their families facing long waiting lists to access services observed in most countries [27,28]. In Quebec (Canada), a survey revealed that over 1000 children were on such lists. Of these, many will wait up to three years to access services [29]. With that in mind, researchers and professionals came together to develop the ABC-ASD program for parents of elementary school-aged children.

Program

The ABC-ASD program relies on weekly group workshops for parents of children aged 6-12 (V6-12). As for the 0-7 program, the primary focus is to gain knowledge and support from the provided content, but also from other parents in the group. However, the content and strategies presented in the 6-12 version have been adjusted for this new age group.

The program’s main objectives are: 1) to increase parents’ knowledge regarding ASD and their sense of competence; 2) to improve the child’s general functioning and their family’s quality of life; 3) to offer parents the tools to improve their interactions with their child, to reduce challenging behaviors and to teach adaptive behaviors based on Applied Behavioral Analysis (ABA); and 4) to offer parents a support group (6 to 10 participants). The program is based on a series of predefined activities ensuring that parents gradually learn to describe and observe their child’s behaviors in both daily activities and specific situations. The sessions take place over a period of 14 consecutive weeks and are administered by a trained professional acting as program facilitator. They are separated into 3 blocks of 3 group workshops and 5 individual home visits, with each visit occurring at the parent’s home (Table 1). The purpose of home visits is to support parents’ understanding of the workshops contents and help them implement the strategies learned. For the most part, workshops are organized in the following way: 1) follow-up on the previous week’s home exercise; 2) new theory; 3) application of the theory using a group exercise; 4) additional theory; and 5) final group exercise. A Participant’s Guidebook, describing the workshops’ activities and concepts, supports participants throughout the sessions, but also allows to keep track of their personal growth in the process.

Table 1: Parents in Action! Training Module Content.

	Week	Modality	Theme
Block 1: Understanding behavior of children with ASD			
	1	Home visit 1	Program presentation
	2	Workshop A	Overview of ASD
	3	Workshop B	Understanding ASD
	4	Workshop C	How to describe and observe a behavior
	5	Home visit 2	Checking in: workshops A - B - C
Block 2: Behavior modification			
	6	Workshop D	Helping effectively by modifying the environment
	7	Workshop E	Increasing a desired behavior or teaching a new behavior
	8	Home visit 3	Checking in: workshops D - E
	9	Workshop F	Decreasing unsuitable behavior
	10	Home visit 4	Checking in: workshop F
Block 3: Everyday strategies for long- term change			
	11	Workshop G	Maintaining and generalizing desired behaviors
	12	Workshop H	Everyday social communication
	13	Workshop I	Identifying future objectives
	14	Home visit 5	Checking in: workshops G - H - I

The purpose of this study is to evaluate 1) the effect on parents and 2) the social validity of the ABC-ASD V6-12 parent training program. The evaluation of effect targets more specifically the dimensions of knowledge about ASD, sense of competence of parents and perceived quality of relationship with their child. On the other end, the evaluation of social validity targets more distinctively social acceptability and overall satisfaction with the program.

Methods

Design

A mixed-methods approach was used, combining quantitative and qualitative methods in the data collection and analysis process.

Participants

Three Health and Social Services institutions in different

regions of the province of Quebec (Canada) took part in the project. The training program was offered to parents of children with ASD aged 6 to 12 years on a voluntary basis. Their participation was independent of other services offered by the institutions. Thirty parents agreed to take part in the program, but for various reasons, however, (e.g., lack of time, family issues), some participants did not complete all the assessment tools for the two stages (pre-, post-) of the study. The final sample comprised 21 parents (18 women and 3 men), with an attrition rate of 30% at the second measurement time. The participants' characteristics are presented in Table 2. The sample includes the parents of 20 children and the participation of both parents for one child. Children are aged 6 to 11 ($M = 8.35, SD = 1.46$), with a greater number of boys in a ratio of 17 to 3. In addition to ASD, 10 children have also associated conditions (e.g., attention deficit/hyperactivity disorder, Tourette's syndrome, dysorthographia, verbal dyspraxia, epilepsy, oppositional defiant disorder, chromosomal deletion).

Table 2: Parent Characteristics (N = 21).

Characteristics	n	%
Age		
20 - 29	1	4.8
30 - 39	12	57.1
40 - 49	7	33.3
50 - 59	1	4.8
Education level ^{ab}		
DES ^c	2	11.8
DEP ^d	2	11.8
College ^e studies, partially completed	1	5.9
DEC ^f	6	35.3
University studies, partially completed	0	0
University degree	6	35.3
Family income ^g		
\$25,000 or less	1	5
\$25,001 - \$40,000	1	5
\$40,001 - \$60,000	7	35
\$60,001 - \$80,000	0	0
\$80,001 - \$100,000	2	10
\$100,000 or more	9	45

^aThe total of the percentages for this variable equal 100.1 % as values have been rounded up. ^bData missing for four parents. ^cHigh school diploma. ^dVocational training diploma. ^{e,f} Post-secondary education (pre-university and career studies). ^gData missing for one parent.

Measurement

The evaluation was conducted using, standardized questionnaires, questionnaires developed by the research team and individual interviews with parents. The questionnaires aiming to measure effect on parents were self-completed approximately four weeks before the start of the program (pre-intervention) and less than four weeks after the end of the

program (post-intervention). The social validity questionnaires and the individual interview were completed at post-intervention.

The research team's Sociodemographic Questionnaire was used to describe the sample (age, family income, number of children, etc.) as well as the characteristics of the child with ASD (age, gender, diagnosis).

The Questionnaire on Parents' Knowledge regarding ASD, also developed by the research team [30], is designed to assess parents' knowledge of ASD. It includes 23 multiple-choice items. Following the application of the correction key, a summative score is calculated. The higher the score, the greater the parent's knowledge. The clarity and relevance of the statements were confirmed with eight parents.

The Parental Competence Questionnaire aims to assess parents' sense of competence. This self-report questionnaire developed by the research team [31] includes 21 items assessing parents' level of agreement on a 5-point Likert type scale ranging from strongly disagree (1) to strongly agree (5). A summative score was calculated with 14 of the items. The higher the score, the greater the parent's sense of competence about caring for their child. A preliminary version of the questionnaire was submitted to a sample of eight people to confirm the clarity and relevance of the items.

The French translation [32] of the Parent-Child Relationship Inventory (PCRI) [33] following a back translation [34] is used to assess the parent's feelings towards his or her child as well as his or her perception of parenthood. It includes 78 items grouped into seven scales (parental support, parental satisfaction, participation, communication, limit setting, autonomy and role orientation). Parents indicated their level of agreement on a 4-point Likert type scale ranging from strongly agree (1) to strongly disagree (4). A summative score was calculated. The higher the score, the more positively the parent perceives their relationship with their child. For this questionnaire, the Cronbach's alpha is ranging from 0.70 to 0.88 [33,35-37].

The French translation [38] of the Parental Locus of Control Scale (PLOC) [39] is used to assess the perception a parent's perceived control over his or her successes or difficulties in raising a child. It is composed of 47 items measuring the perceptions of control specific to the parent-child relationship. It is structured around five dimensions (parental efficacy, parental responsibility, the child's control over the parent's life, the parent's beliefs with regard to fate and/or luck, and the parent's control over the child's behavior). A 5-point Likert type scale ranging from strongly disagree (1) to strongly agree (5) is used by participants to answer the questions. A summative score was calculated for each scale. A high total score corresponds to a more external locus of control (little sense of control). The Cronbach's alpha of the total scale of the original version is 0.90-0.92 [36,39] while those of the subscales range from 0.65 to 0.77 [39].

Social validity was assessed via three standardized questionnaires. Social acceptability was measured using the French version [40] of the Treatment Evaluation Inventory-Short Form (TEI) [41], which was adjusted to the context of the training program. This tool documents parents' perception of the effectiveness of the program's intervention procedures. The nine items relate to the procedures' relevance, acceptability, perceived effectiveness and adverse effects, using a 5-point Likert scale

ranging from strongly disagree (1) to strongly agree (5). The sum of the items was calculated. Where a higher score meant a higher acceptability. According to the authors, a score of 27 or higher corresponds to moderate acceptability. The alpha coefficient ranges from 0.85 [41] to 0.91 [42].

The French version [43] of the Therapy Attitude Inventory (TAI) [44] assesses parents' satisfaction with the procedures in the training program. The 10 items pertain to the sense of acquiring new knowledge and parenting skills, the sense of parental trust, the relationship with the child, the child's behavior, the indirect effects on other family problems, and overall satisfaction. Respondents were asked to rate each item using a 5-point Likert scale of increasing satisfaction. A summative score was calculated, and the higher the score, the higher the parents' overall satisfaction with the procedures in the program. The internal consistency of the inventory is satisfactory, showing an alpha coefficient which varies from 0.88 [45] to 0.91 [46].

Parents' overall satisfaction with the program was assessed using the Client Satisfaction Questionnaire (CSQ-8) [47] translated to French and validated in Quebec by Sabourin et al. [48]. This tool includes eight items relating to service quality, type of service, expectations met, recommendation to a friend, amount of help received, problem solving and overall satisfaction. Parents used a 4-point Likert type scale to rate the items (e.g., quite dissatisfied [1] to very satisfied [4]). A total score was obtained by summing all the items. The higher the score, the higher the parent's satisfaction with the program. The degree of internal consistency of the CSQ-8 is high, with an alpha coefficient varying from 0.89 [48] to 0.92 [49].

Participants also answered 15 questions developed by Ilg [50]. For the purposes of this article, however, only the two questions (scale of 1 to 5) were used for analysis: the one pertaining on future uses of the procedures learned in the program and a second on the possible recommendation of the program to other parents.

Finally, in post-intervention, a semi-structured "Have Your Say" interview was administered to each participant. This semi-structured interview relying on nine questions was developed by the research team, to gather qualitative information about the effects of the program (e.g., "What was the impact of the program on family life?") and their appreciation (e.g., "How do you feel about the program being offered in a group setting?").

Procedures

Approval was obtained from the ethics committee for psychosocial research of the Health and Social Services institutions of the Mauricie-Centre-du-Québec (CÉRP-2018-001). The relevance and feasibility of the project was approved by the three participating institutions. Each participating institution identified professionals that would act as the program facilitator for the group of parents participating in the study. A one-day face-to-face and web conference training was offered to these stakeholders to help them fulfill their role: to act as group facilitators and home

visitors in the project. Parents of children with ASDs aged 6 to 12 in the waiting list or in the process of receiving ASD services were then contacted by the trained facilitator in order to present the research project and the program associated with it. A particular attention was accorded to make it specifically clear that their participation in the project was totally independent from the services provided by the institution. Interested parents agreed to have their contact information forwarded to the research team for further information and to provide written consent to participate in the project. The training program began in October 2018 with 4 groups of parents in 3 regions of Quebec (Canada). A month before the first workshop, questionnaires were filled out by the parents (pre-intervention). They were used to collect data to describe the sample. Questionnaires on the effects on parents were completed at the beginning (pre-intervention) and again at the end of the training program (post-intervention). At the end of the program, parents also completed questionnaires to assess its social validity.

Analysis

Quantitative data provided by the questionnaires were compiled and analyzed using SPSS 26 software. Parametric paired means comparison analyses (paired T-test) were performed to measure the evolution of ASD knowledge, parental competence and parent-child relationship. Prior to these analyses, an outlier analysis was performed, as suggested by Tabachnick & Fidell [51], to identify disproportionately high data to further replace them by extreme scores, according to the winsorization procedure [52]. No outliers were found in the present study. The analyzed data also meet the normality condition (Shapiro-Wilk test).

Qualitative data on the effects of the ABC-ASD V6-12 training program and on social validity collected via semi-structured

individual interviews with participating parents were audio-recorded, transcribed and analyzed using thematic content analysis based on the approach proposed by Bardin [53]. The choice of categories was determined in advance consistent with the study's objectives, as is the norm for a closed evaluation process and the translation of study indicators [54]. Accordingly, the analysis grid was developed around the themes under study (parental competence, knowledge regarding ASD, parental effectiveness and satisfaction with the program). Closed coding was performed by the principal investigator and a trained research assistant with an overall inter-rater reliability of 87%, ranging from 82% to 92% for each category.

Results

The purpose of this study was to evaluate the ABC-ASD V6-12 training program adapted for parents of children aged 6 to 12 years. The results are presented according to the two objectives: (1) the effects on parents, (2) the social validity of the training program.

Effects on parents

To address the first objective: to evaluate the effects of the ABC-ASD V6-12 training program on parents of a child with ASD, paired means comparison analyses (paired T-test) were conducted on pre-intervention and post-intervention scores on ASD-related knowledge, sense of parenting skills, and parent's sense of their relationship with their child measures (Table 3). An analysis of the parents' comments ($n = 21$) collected during the semi-structured individual interviews allowed to discern self-perceived effects by the parents. These effects are described according to the variables studied.

Table 3: Comparison of Means (Paired T-Test) Between Pre-Intervention and Post-Intervention Measurement of ASD-Related Knowledge, Parenting Skills, Parent-child Relationship.

Variables	Pre-intervention		Post-intervention		df	t	p
	M	SD	M	SD			
Knowledge regarding ASD	9.55	1.93	14	2.77	19	-6.67	<0.001
Parental competence scale	47.71	5.89	53.19	6.07	20	-3.73	0.001
Parent-child relationship							
PCRI	193.2	10.48	198.15	9.43	19	-2.43	0.025
PLOC	131.24	11.04	123.12	11.55	16	3.43	0.003

Knowledge Regarding ASD: The mean scores obtained in the pre-intervention ($M = 9.55, SD = 1.93$) and post-intervention ($M = 14.00, SD = 2.77$) periods were significantly different, indicating an increase in parents' knowledge of ASD in the post-intervention period ($t(19) = -6.67, p < 0.001$). The increase in knowledge about ASD is also reported in the semi-structured interviews. After completing the program, parents report that they have learned a lot and feel "... well equipped" and they consider that the acquired

tools "can be use all the time" (Parent 4). They say that they have a better understanding of ASD and are more able to understand their child's behaviors. To this effect, a parent states: "We can see more clearly. We understand better. When we see a behavior, now we deal with it and try to understand" (Parent 9). Some also say that the knowledge acquired will be useful in their collaboration with school:

We spoke with case workers and teachers who work at the school about strategies to apply. We discussed the challenges of socializing, and some tips were exchanged for everyone's enjoyment (Parent 4).

Although the program was useful, some parents learned less than they expected, as they felt the content was more focused on younger children or more severe cases.

Parental competence: A significant improvement in parents' perceived sense of parenting skills ($t(20) = -3.73, p = 0.001$) was also observed over time. The comments reveal that almost all parents report having a greater sense of competence. They "... feel more equipped" (Parent 14) and are "... more confident" (Parent 11). Some say their outlook has changed. Parents report having gained in autonomy, in ability to identify more solutions and in providing "... more arguments for the teachers" (Parent 15). In fact, some parents notice that their child had fewer meltdowns. One reports that "there used to be a lot of anger outbursts... but now I know what to do" (Parent 13). Parents also notice that they can now help their child calm down more easily. They are pleased to see that they can induce changes in their child's behavior:

With this program, I've set up interventions. When his behavior is adequate, he accumulates points and possibly a privilege, so his challenging behavior is reduced; he expresses himself correctly or asks for help. It's quite a change for us. (Parent 1).

The Parent-child relationship: In terms of the parent-child relationship, the results show that the parent's feeling about their child and their perception of their parenting, evaluated with the PCRI, increases in the post-intervention ($t(19) = -2.43, p = .025$). The results also show a significant difference ($t(16) = 3.43, p = 0.003$) between the scores on the PLOC global scale in pre-intervention ($M = 131.24, SD = 11.04$) and post-intervention ($M = 123.12, SD = 11.55$). Given that the rating scale is inverted, meaning the lower the scores, the more in control the parents felt and the more effective they perceived themselves to be in their parenting, indicating a more internal locus of control in the post-intervention than in the pre-intervention. These results are highlighted by the comments collected from the parents, as the majority of parents reported that their participation in the program had a positive impact on their relationship with their child. The changes are estimated to be big for some and small for others. A recurring theme expressed is that the relationship has become more relaxed:

We felt our blood pressure drop because we could better understand our daughter's meltdowns. This is positive because I'm able to explain my daughter's behaviors to my partner with real explanations that I understand (Parent 15).

Reduced tension and greater harmony are also obvious in the following comments:

There's been a change for the better at mealtimes. There are fewer threats, less stress (Parent 5).

It's okay. We don't need to get angry as much. The climate has improved a lot (Parent 11).

The climate...has really calmed down ... it's less of a burden for everyone. The relationship is calmer too, especially during morning and evening routines. It's much more pleasant (Parent 7).

Many also report that their parent-child relationship has improved. Regarding the ABC-ASD V6-12 program, they comment:

It has helped my relationship with my son a lot. I'm less resentful because I understand him better. I have more patience with him (Parent 3).

Our reactions to his behavior have changed, we're less impatient. We try to understand more, to find solutions (Parent 9).

He tends to come towards us. He's calmer and tells us he loves us. He seems to feel much more secure and understood (Parent 10).

Finally, routines seem to have improved in families, especially in terms of structure, which promotes a better relationship:

We've learned to be more structured to avoid meltdowns (Parent 3).

Being well organized helped a lot. She's more receptive. It's getting better and better (Parent 10).

Social validity

The assessment of social validity of the program was stated as second objective, with social acceptability and satisfaction as main dimensions for the evaluation.

Social acceptability. Parents positively rate the social acceptability of the procedures learned in the program with a mean score of 38.95/45 ($SD = 4.41$), which is above the threshold of 27 qualified by Kelley et al. (TEI, 1989) for moderate acceptability. Their level of satisfaction with the procedures taught in the ABC-ASD V6-12 training program, is also high ($M = 41.9/50, SD = 5.17$). Specifically, the majority of the TAI items (Eyberg, 1993) average above 4/5. The item relating to the parents' overall opinion of the ABC-ASD V6-12 program obtains the highest mean score ($M = 4.76$) and one of the lowest response variabilities ($SD = 0.54$). Although rated lower by parents, items related to the program's ability to help them with personal or family issues not directly related to their child with ASD ($M = 3.86, SD = 0.66$) and their feeling that their child is responsive to their requests ($M = 3.86, SD = 0.57$) nonetheless obtain positive scores in average.

Furthermore, the procedures taught in the program were considered effective. Indeed, while a parent mentions that "I have

seen change, my way of seeing things has changed and behaviors have changed (Parent 4)” and “... we can finally see the light!” (Parent 11). They recognize that applying the procedures they have learned has produced changes in their child: “... autonomy has been developed in all areas” (Parent 2) and “... great progress on the behavior to be improved” (Parent 3). Some “... were able to generalize certain previously acquired contextual behaviors” and observe a “... decrease in challenging behaviors with the adaptation of the environment” (Parent 3). For example, “Sitting at the table is better. Also, the problem of throwing garbage in the living room has improved” (Parent 5).

Satisfaction with the program. The assessment of the overall satisfaction with the program (services), was achieved with the administration of the CSQ-8 (Larsen et al., 1979), which showed a high general score ($M = 28.33/32$; $SD = 3.58$). Items analysis reveals that all average scores are greater than or equal to 3.24/4. The item addressing expectations (“How well did our program meet your expectations?”) is rated lowest ($M = 3.24$) but has the second highest response variability ($SD = 0.63$). In fact, over 90% of participants felt that the ABC-ASD V6-12 program met most (57.1% %) or almost all (33.3%) of their expectations. On the other hand, the item related to the quality of service provided through this specific program obtains the highest average score ($M = 3.81$) while displaying the lowest variability ($SD = 0.40$).

When asked, several parents said that they were very satisfied with their participation in the program. Some people “... liked it a lot, the program as much as the exchanges [with others] and the program facilitators” (Parent 8). Others were “...extremely happy. Very happy, [I’ve] learned a lot” (Parent 9) or “... very satisfied and happy that I did it” (Parent 13).

In fact, all participating parents would recommend the program to other parents, with more than three-quarters ($n = 16$) strongly recommending it. This strong consensus is also true for perceived future uses of what was learned, since all but one participant expresses their intention to apply contents of the program in the future:

Honestly, if they have the chance to join the program, they should grab it. It’s a great program and so rewarding. [...] We don’t even have that type of service in the private sector. It’s a chance to participate. (Parent 8).

Parents also report that participating in the program allowed them to exchange with parents in similar situations, thus breaking their isolation:

“It’s good to have the opportunity to interact with parents going through the same thing.” (Parent 2).

All parents should follow [the program], it’s the basis [foundation]. These workshops are really there to help us understand why our child is like that, why he reacts that way. We

also feel less alone. It’s all positive. (Parent 11).

Regarding the procedures learned in the program, some parents mention: “This has been applied every day in our home, especially when the child is in crisis.” (Parent 13) and “It’s going well. Eventually, there are others [strategies] that we want to implement.” (Parent 7).

Discussion

Given the growing number of ASD diagnoses and the long waiting times for services, the need to provide parents of children with ASD with empowering strategies and knowledge appears critical. The development of the ABC-ASD V6-12 program aims to respond to this growing need. However, before this program is offered, it is important to test and document it with parents of children aged 6-12 with ASD. The present study focuses to evaluate this adapted version on the two following objectives 1) the effects on parents, 2) the social validity of the program.

Effects of training program on parents

This study’s primary objective was to assess the effects of the ABC-ASD V6-12 training program on parents of children with ASD. First, results from both the statistical and content analysis show that parents significantly increased their sense of competence. As various authors argue, improving the sense of competence of parents of children with ASD can directly improve their quality of life and that of their child [11,55,56]. Higher perceived parental competence scores are also associated with healthier stress levels [36,57], which may also contribute to parents’ quality of life.

As with parental competence, parents in the program significantly increased their knowledge regarding ASD. This result echoes results in other studies on PMI, who found that parents improved their knowledge in this regard [58,59]. Parents in the present study comment that the knowledge acquired through the program enabled them to better understand their child’s behavior. This result concurs the findings of Pennefather et al. [60], who report that their participants’ new knowledge helped them cope more effectively with their child’s behavioral problems.

Of further interest are findings on improvement of the parent-child relationship on limit setting, discipline and parents’ willingness to promote their child’s autonomy. Parents report gaining a greater sense of parental responsibility and control over their child’s behavior. These results suggest a positive change in parenting attitudes among program’s participants. As some studies demonstrate, the sense of being responsible, in control [12,13] and effective in the education of one’s child [11] correlates with a better quality of life among parents of children with ASD. These findings demonstrate that the ABC-ASD V6-12 program supplies parents with the tools to assist with their child, and boost several variables associated with improved quality of life.

Social validity

The second aim of this study is to examine the social validity of the training program. In this regard, results show strong social validity, and favorable parents' perceptions. All participants intend to use the procedures they learned in future. Parents rate positively the program's ability to help them with personal or family problems, and comment it answers to their needs. Other studies lead to similar conclusions [61,62] in terms of better knowledge on ASD and improved parent-child interactions for participating parents.

Parents also expressed important satisfaction with the program and the quality of services received. Their overall satisfaction is very high, with one specific point of contentment involving their new ability to solve problems more efficiently. This result is of interest since studies report that problem-focused coping strategies positively impact parental stress and quality of life (Verhnet et al. 2019). Some parents also report that they appreciate the opportunity to interact with other parents in similar situations and break their isolation. In short, results point to three main findings: parents of children with ASD appreciate the program and find it useful, the program has strong social validity, and the community would benefit from its implementation.

Conclusion

The findings of this study add to the growing body of literature supporting the usefulness of parent training programs [57], particularly at a time when waiting lists for services is long and many parents find themselves without resources. To sum up, it appears that the ABC-ASD V6-12 program improves several variables pertaining to the experience of parents of children with ASD: perceived parental competence, knowledge regarding ASD, and perception of the parent-child relationship. Furthermore, its strong social validity and satisfaction, which were expressed by parents, represent important indicators of parental adherence to this program.

Some limitations for this study should be mentioned. The sample was composed mostly of mothers; therefore, the results cannot be applied to fathers of a child with ASD. Sampling bias is also possible since the participants were not randomly selected. Moreover, it is important to specify that this experimentation took place in Quebec (Canada) service context. Generalization to other contexts must therefore be applied with caution. Moreover, an attrition rate of 30% of participants is not negligible, although it is similar to the attrition rate of other similar studies [63,64]. Another limitation concerns the lack of a control group, preventing comparison of the results obtained in this study with those of a sample of parents not participating in the program. Finally, the results from the questionnaires developed by the research team must be interpreted with caution given the absence of thorough validation and standardization of these tools.

Future studies are necessary to further investigate the fidelity of program implementation. Adjustments of the program could also be applied based on parental feedback (e.g., involving the child more, developing a wrap-up workshop). Finally, because the participant sample in this study was primarily mothers, future research could focus on the effects of ABC-ASD V6-12 with a sample of fathers [64-71].

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